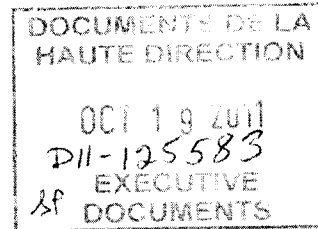




Commissioner of the Environment and Sustainable Development of Canada
Commissaire à l'environnement et au développement durable du Canada
Office of the Auditor General of Canada • Bureau du vérificateur général du Canada

14 October 2011

Mr. Serge Dupont
Deputy Minister
Natural Resources Canada
580 Booth Street, 21st Floor, Suite B5-1
Ottawa, Ontario K1A 0E4



Dear Mr. Dupont:

Enclosed is a numbered/controlled copy no 04-01398 of the English transmission draft chapter on our study of environmental monitoring for inclusion in the December 2011 Report of the Commissioner of the Environment and Sustainable Development. Along with a copy of this letter, we are sending four (4) additional copies [numbered 04-01399 to 04-01402] of the document to Joe Freamo. The French version of the transmission draft chapter will be sent to you as soon as it is available.

We would be pleased to meet with you if you wish to discuss the results of the study. To meet our deadlines, we must receive your written agreement **by 25 October 2011** that this draft chapter presents the findings of our study factually and fairly—or, should you disagree, specify where and why you disagree.

The draft chapter is labelled "NOT TO BE COPIED, Draft Document for the purposes of fact verification and comment only, Property of the Office of the Auditor General of Canada, Protected A." This establishes its status as an OAG working paper. The document and the information contained therein are to be kept in strict confidence. Therefore, until the relevant Report is tabled in the House of Commons, please treat the draft chapter with appropriate discretion.

This draft chapter is not to be photocopied or reproduced in any way. If you require additional copies, we will be pleased to make them available to you. All copies of the draft chapter must be returned to us no later than one week following tabling of the relevant Report in the House of Commons. We therefore urge your department to track the distribution of the drafts issued to you to facilitate their retrieval and return. We also request that you inform us immediately if any numbered/controlled draft chapter is lost or made public.

This draft chapter reflects the results of detailed discussions with your officials as well as those from the other entities included in the scope of the study. I believe that we have corrected all factual errors and addressed all of the comments. In our view, the current draft presents the findings of our study factually and fairly. If you have any concerns in this regard, please convey them to us as soon as possible. In particular, I would appreciate knowing if there are any major monitoring systems that fall under your responsibility that we should have included in the inventory.

.../2

000001

As with all chapters in my report, I may meet with the responsible Minister following your formal sign-off, usually about one or two weeks before the Report is tabled. About three weeks before tabling, a letter will be sent to the Minister, copied to you, extending the offer of a meeting. If your Minister chooses to request a meeting, we will inform you accordingly.

We ask that you designate a department official to review the French text of the transmission draft chapter once it is provided to you. This review is your opportunity to identify any concerns you may have with our chapter translation. We would appreciate receiving your comments as soon as possible, and no later than **15 November 2011**.

I would like to thank you for the cooperation extended to the study team by your staff throughout the study, in particular those people who contributed through the departmental liaison committee.

If you have any questions or would like to discuss any aspect of this draft chapter, we would be pleased to meet with you. Please do not hesitate to call me or the audit team Principal, Bruce Sloan, or Lead Director, Peter Morrison, at 613-995-3708.

Yours sincerely,



Scott Vaughan
Commissioner of the Environment and Sustainable Development

Enclosure (1): Transmission draft chapter dated (14 October 2011), copy no 04-01398

c.c.: Joe Freamo, Chief Audit Executive, NRCan
Ronald Campell, Assistant Auditor General (responsible for the entity)
Dusan Duvnjak, OAG Principal (responsible for the entity)



14 octobre 2011

Monsieur Serge Dupont
Sous-ministre
Ressources naturelles Canada
580, rue Booth, 21^e étage, bureau B5-1
Ottawa (Ontario) K1A 0E4

Monsieur,

Vous trouverez ci-joint une copie numérotée et contrôlée no 04-01398 de la version anglaise de l'ébauche de chapitre portant sur notre étude sur la surveillance environnementale. Ce chapitre fera partie du rapport de décembre 2011 du commissaire à l'environnement et au développement durable. Veuillez noter qu'un exemplaire de la présente lettre ainsi que quatre (4) autres copies numérotées et contrôlées [de 04-1399 à 04-01402] de l'ébauche de chapitre sont également envoyés à M. Joe Freamo. Nous vous ferons parvenir les copies de la version française dès que possible.

Si vous le souhaitez, nous serons heureux de vous rencontrer pour discuter des résultats de l'étude. Afin que nous puissions respecter notre échéancier, vous devez nous confirmer par écrit **d'ici le 25 octobre 2011** que les constatations de notre étude sont exactes et justes (ou nous fournir des commentaires détaillés sur les points de divergence).

L'ébauche de chapitre porte la mention « COPIE INTERDITE, Ébauche aux seules fins de vérification des faits et de commentaires, Propriété du Bureau du vérificateur général du Canada, Protégé A ». Cette mention établit le statut de l'ébauche de chapitre en tant que document de travail du BVG. Ainsi, le document et les renseignements qu'il contient doivent être traités de manière confidentielle. Par conséquent, d'ici au dépôt du rapport à la Chambre des communes, nous vous prions de traiter l'ébauche de chapitre avec la discrétion qui s'impose.

La présente ébauche de chapitre ne doit pas être photocopiée ni reproduite de quelque façon que ce soit. Si vous avez besoin de copies supplémentaires, nous serons heureux de vous en fournir. Toutes les copies de cette ébauche doivent nous être retournées au plus tard une semaine après le dépôt du rapport à la Chambre des communes. Nous demandons donc instamment à votre ministère d'assurer le suivi de la distribution des ébauches qui vous seront remises afin d'en faciliter la récupération et le retour. Nous vous demandons également de nous informer sans délai si une copie numérotée et contrôlée de l'ébauche de chapitre est perdue ou rendue publique.

.../2

Cette ébauche de chapitre reflète les résultats des discussions approfondies que nous avons eues avec vos représentants de même qu'avec les représentants d'autres entités visées par l'étude. Je crois que nous avons corrigé toutes les erreurs de fait et que nous avons tenu compte de tous les commentaires que nous avons reçus. Nous considérons donc que l'ébauche présente les constatations de notre étude de manière juste et factuelle. Si vous avez des inquiétudes à cet égard, veuillez nous en faire part dès que possible. En particulier, nous apprécierions que vous nous indiquiez s'il existe des systèmes de surveillance importants qui relèvent de votre responsabilité que nous devrions avoir inclus dans l'inventaire.

Comme pour tous les chapitres dans mon rapport, je peux rencontrer le ministre responsable suivant votre approbation du chapitre. Cette rencontre a habituellement lieu environ une semaine ou deux avant le dépôt du rapport. Environ trois semaines avant le dépôt du rapport, nous enverrons une lettre au ministre offrant de le rencontrer pour discuter du chapitre, et vous recevrez une copie conforme de cette lettre. Si le ministre demande qu'une rencontre ait lieu, nous vous en aviserons en temps opportun.

Lorsque vous recevrez la traduction française de l'ébauche de chapitre, nous vous prions de désigner un représentant du ministère qui l'examinera pour s'assurer qu'elle est fidèle à la version anglaise. Cet examen vous permettra de nous faire part de toute préoccupation que vous pourriez avoir à ce sujet. Nous vous saurions gré de nous faire parvenir vos préoccupations à cet égard le plus tôt possible, au plus tard le **15 novembre 2011**.

Je tiens à vous remercier de l'excellente collaboration offerte par votre personnel à notre équipe tout au long de l'étude, en particulier ceux qui ont contribué au comité de liaison des entités.

Si vous avez des questions ou si vous souhaitez discuter de n'importe quel aspect de l'ébauche de chapitre, nous serions heureux de vous rencontrer. N'hésitez pas à m'appeler ou à communiquer avec le directeur principal de l'étude, Bruce Sloan, ou le premier directeur, Peter Morrison, au 613-995-3708.

Veuillez agréer, Monsieur, l'expression de mes sentiments distingués.



Scott Vaughan
Commissaire à l'environnement et au développement durable

P.j. Ébauche de chapitre du 14 octobre 2011, copie no 04-01398

c.c. Joe Freamo, Dirigeant principal de la vérification, RNCan
Ronald Campbell, vérificateur général adjoint (responsable de l'entité)
Dusan Duvnjak, directeur principal (responsable de l'entité)



Office of the Auditor General of Canada
Bureau du vérificateur général du Canada

Office of the Auditor General of Canada

2011 December Report of the Commissioner of the Environment and Sustainable Development

[December 2011 Report](#)

[PDF \(640 KB\)](#)

[News Release](#)

Report available online at:
http://www.oag-bvg.gc.ca/internet/English/parl_cesd_201112_05_e_36033.html

From: Paquin, Sylvie
To: De Sousa, Donatilde; Legault, Monique; Allaire, Nancy
Sent: Wed 10-19-2011 7:06:58 PM GMT
Subject: URGENT DOCKET - 125583
Importance: High
Message Flag: Microsoft Exchange Server
Flag Status: Flagged

From: Paquin, Sylvie Sent: 2011-10-19 3:06:58 PM
Salut Monique,

This Docket is in your bin.

Thank you

Sylvie Paquin
Correspondence Control Officer / Agente de contrôle de la correspondance
Executive Documents Unit / Unité des documents de la haute direction
Public Affairs & Portfolio Management Sector / Secteur de la gestion des
affaires publiques et du portefeuille
Corporate Secretariat and Parliamentary Affairs Branch / Direction du
secrétariat ministériel et des affaires parlementaires

E-Mail : [HYPERLINK "mailto:spaquin@nrcan.gc.ca"spaquin@nrcan.gc.ca](mailto:spaquin@nrcan.gc.ca)
Telephone : 613- 947-0581
Facsimile / télécopieur 613- 995-0032
Natural Resources Canada, 580 Booth Street, 21st Floor, Ottawa, Ontario,
K1A 0E4
Ressources naturelles Canada, 580 rue Booth, Ottawa, Ontario, K1A 0E4
Government of Canada / Gouvernement du Canada

Docket No. / N° du dossier :
D11-125583

Due Date / Date d'échéance :
October 21, 2011

NATURAL RESOURCES CANADA / RESSOURCES NATURELLES CANADA

**EXTERNAL CORRESPONDENCE CONTROL FORM /
FORMULAIRE DE CONTRÔLE DE CORRESPONDANCE EXTERNE**

To / À : AB	
Cc : DM, DMA	
From / De : EDU	
Subject / Objet : ENCLOSED NUMBERED COPY 04-01398 - A STUDY OF ENVIRONMENTAL MONITORING	
Date : October 19, 2011	Prepared by : Sylvie Paquin Préparé par :

<input checked="" type="checkbox"/> Action	<input type="checkbox"/> Reply / Réponse
<input type="checkbox"/> Information	<input type="checkbox"/> Recommendation / Recommandation

To be completed by sector / Réservé au secteur	
Prepare / Préparer :	For / Pour :
<input type="checkbox"/> Memo for information / Note pour information	<input type="checkbox"/> Deputy Minister / Sous-ministre
<input type="checkbox"/> Memo for action / Note pour action	<input type="checkbox"/> Associate DM / SM délégué
<input type="checkbox"/> Memo for signature / Note pour signature	<input type="checkbox"/> Other / Autre
<input type="checkbox"/> Memo for decision / Note pour décision	
<input type="checkbox"/> Memo for meeting / Note pour réunion	
<input type="checkbox"/> Letter / Lettre	
<input type="checkbox"/> Other / Autre	
Note / Remarque :	
<input type="checkbox"/> No reply required / Aucune réponse nécessaire	
<input type="checkbox"/> Direct reply / Réponse directe	
<input type="checkbox"/> Other action taken or proposed / Autre mesure prise ou propose	
Comments / Commentaires :	
Date :	Signature :



Natural Resources
Canada

Ressources naturelles
Canada

Deputy Minister

Sous-ministre

Ottawa, Canada
K1A 0E4

OCT 21 2011

Mr. Scott Vaughan
Commissioner of the Environment
and Sustainable Development
Office of the Auditor General of Canada
240 Sparks Street
Ottawa, Ontario K1A 0G6

DM

AB

EDU

2011-125583

Dear Mr. Vaughan:

Thank you for your letter of October 14, 2011, providing numbered copies of the draft chapter on the study of environmental monitoring for inclusion in the December 2011 Report of the Commissioner of the Environment and Sustainable Development.

We appreciate the opportunity to review the draft copy and are pleased to inform you that Natural Resources Canada is satisfied that the text is presented factually and fairly.

We note that the study does not include recommendations. While we appreciate your invitation to meet with me or other senior managers to discuss the draft chapter, that will not be necessary.

The department understands that this chapter has not been publicly released and will keep it in strict confidence until the report is tabled in Parliament.

Yours sincerely,

Serge P. Dupont

c.c.: Mr. Ronald Campbell
Assistant Auditor General, Office of the Auditor General of Canada

Mr. Dusan Duvnjak
Principal, Office of the Auditor General of Canada

Canada

Mr. Scott Vaughan
Commissioner of the Environment
and Sustainable Development
Office of the Auditor General of Canada
240 Sparks Street
Ottawa, Ontario K1A 0G6

Dear Mr. Vaughan:

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Yours sincerely,

Serge P. Dupont

c.c.: Mr. Ronald Campbell
Assistant Auditor General, Office of the Auditor General of Canada

Mr. Dusan Duvnjak
Principal, Office of the Auditor General of Canada

Mr. Ronald Campbell
Assistant Auditor General
Office of the Auditor General of Canada
240 Sparks Street
Ottawa, Ontario K1A 0G6

Mr. Dusan Duvnjak
Principal
Office of the Auditor General of Canada
240 Sparks Street
Ottawa, Ontario K1A 0G6

From: EDU
To: Allaire, Nancy; De Sousa, Donatilde; Legault, Monique
Sent: Mon 10-24-2011 2:30:03 PM GMT
Subject: DM SIGNED LETTER OCTOBER 21 (125583)

From: EDU Sent: 2011-10-24 10:30:03 AM

Copy for your files.

Thank you.

Yvette Champagne
<<Goto Record 131488 in database 1.ccm>>
Goto Record 131488 in database 1.ccm

C.D. Howe Institute COMMENTARY

FISCAL AND TAX COMPETITIVENESS

Rethinking Royalty Rates:

Why There Is a Better Way to
Tax Oil and Gas Development

Full report available at: http://www.cdhowe.org/pdf/commentary_333.pdf

COLIN BUSBY
BENJAMIN DACHIS
BEV DAHLBY



In this issue...

Provinces should reduce their reliance on royalties and increase their reliance on auction payments in the conventional oil and gas industry.



N11-122848

MEMORANDUM TO THE DEPUTY MINISTER

**REPLY TO MR. FINN POSCHMAN,
VICE PRESIDENT, RESEARCH, C.D. HOWE INSTITUTE**

(Signature Required by July 20, 2011)

SUMMARY

- Mr. Poschmann has asked for your comments on a draft paper relating to Alberta's royalty regime.
- We have drafted an e-mail reply and comments on the paper's methodology for your office to send.
- The letter makes it clear that we are in no way criticizing or commenting on Alberta's royalty systems or supporting the C.D. Howe conclusions, just providing a critique of the economic and methodological issues.

BACKGROUND

Mr. Finn Poschmann sent you an e-mail on June 29, 2011, asking for your comments, if possible, by July 13, 2011, regarding a draft paper by Ben Dachis, Colin Busby and Bev Dahlby, provisionally titled "The Capitalization of Alberta's Oil and Gas Royalty Change in Bonus Bid Auction Values."

Attached is our proposed e-mail response, including an attachment with Energy Sector's comments on the paper for C.D. Howe (Attachment 1).

CONSIDERATIONS

The paper examines two elements of the Alberta royalty and land rental regime for oil and gas. In particular, it examines bonus bids—that is, the amounts collected in respect of rights to explore for and produce oil and gas on provincial lands—and royalties.

The paper looks at the impact of royalty changes on bonus bids and suggests that raising royalty rates may be more than offset by the induced decline in bonus bids; that is, since raising royalties reduces the profitability of resources, firms will bid less for the right to explore for and develop oil and gas.

The paper presents as evidence an analysis of the impact of Alberta's 2007 announcement to raise royalty rates.

The paper concludes by recommending that provinces reduce their reliance on royalties in the conventional oil and gas industry since royalties distort production decisions. Specifically, the paper recommends that Alberta adopt less-distortionary cash flow taxes or alternatively reduce their royalty rates and increase their reliance on bonus bids.

Our comments are not directed at the royalty policy recommendation, particularly since we would not want to comment on an area of provincial jurisdiction. Instead, we have provided comments on some methodological issues. In particular, we have identified the following issues:

- The paper says bonus bids should be depreciated over time, but it was not clear from the analysis that this is what the authors had done;
- The paper notes that royalty and bonus bid policy could focus on maximizing activity in the energy sector or it could focus on maximizing revenues; however, the discussion of policy options does not explicitly address these two policy goals;
- The paper relies on a theoretical treatment of oil and gas exploration and production—we suggested that a project cash flow analysis might provide some useful insights;
- The paper attempts to control for geological factors by comparing bonus bids in a 100-kilometre band along provincial borders—we suggested that a closer look at the geological formations could show different types of plays, and so we would recommend caution in using this approach; and
- Finally, the paper indicates that resource royalties directly reduce a firm's profits, dollar for dollar; however, since royalties are tax deductible, the impact on profits is less than dollar for dollar.

Approved
for A/ADM
Mark DiOrio.

- 3 -

UNCLASSIFIED

RECOMMENDATION

It is recommended that you consider sending the attached e-mail.

Mark Corey

Attachment: (1)

Contact: Reg Plummer, 613-996-6620
Energy Policy Branch, ES

Mongeon, Johanne

From: Mongeon, Johanne on behalf of Dupont, Serge
Sent: July 18, 2011 10:29 AM
To: 'kgray@cdhowe.org'
Subject: Comments on "The Capitalization of Alberta's Oil and Gas Royalty Change in Bonus Bid Auction Values"

Attachments: Comments.doc

Dear Mr. Poschmann:

Thank you for your correspondence of June 29, 2011, regarding the draft paper by Mr. Ben Dachis, Mr. Colin Busby and Ms. Bev Dahlby, provisionally titled "The Capitalization of Alberta's Oil and Gas Royalty Change in Bonus Bid Auction Values."

We appreciate the opportunity to comment on the paper. I would like to preface our response by clarifying that it should not be construed as commenting in any way on provincial royalty regimes. We would not presume to comment on this area of provincial jurisdiction. Instead, our comments focus on some of the economic and methodological issues arising from our reading of the paper. I am attaching comments prepared by my staff, which can be provided directly to the authors. I hope that your authors find them useful.

There is a need for more economic analysis of important energy policy issues, and, in that spirit, I welcome the contribution the C.D. Howe Institute is making with this paper. I hope that we may look forward to more such examinations of important resource policy issues in the future.

Again, thank you for writing.

Yours sincerely,

Serge P. Dupont
Deputy Minister
Natural Resources Canada

Attachment: (1)



Comments.doc
(38 KB)

De : Finn Poschmann [<mailto:fposch@cdhowe.org>]

Envoyé : Wednesday, June 29, 2011 05:03 PM

À : Dupont, Serge

Objet : Request for comments on the Effect of Royalty Rates in Western Canada

Hello. I am taking the liberty of enclosing a draft by Ben Dachis, Colin Busby and Bev Dahlby, provisionally titled "The Capitalization of Alberta's Oil and Gas Royalty Change in Bonus Bid Auction Values." in the hope that you might be willing to review it.

We at the Institute would be pleased to receive any comments you may have. If you are able to respond by Wednesday,

July 13, 2011, we would be especially grateful. Comments on whatever level, from existential to detailed facts and matters of exposition, are equally welcome. The paper will be thoroughly copy-edited before release.

Please send your comments by mail at HYPERLINK "<mailto:kgray@cdhowe.org>"kgray@cdhowe.org
<<mailto:kgray@cdhowe.org>> , e-mail, or fax - whatever is most convenient for you – and indicate whether you are willing to have them sent directly to the author, or whether you would like them passed on anonymously.

For clarity, the attached is a review draft and we trust that you will not cite or circulate this document; it is not for distribution.

Thank you in advance for your time and expertise.

Finn Poschmann

Vice-President, Research

C.D. Howe Institute

300-67 Yonge Street, Toronto, M5E 1J8

Phone: 416-865-1904; Fax 416-865-1866

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Natural Resources
Canada

Ressources naturelles
Canada

Deputy Minister

Sous-ministre

Ottawa, Canada
K1A 0E4

JUL 15 2011

Mr. Finn Poschmann
Vice President, Research
C.D. Howe Institute
kgray@cdhowe.org

Subject: Comments on "The Capitalization of Alberta's Oil and Gas Royalty Change in Bonus Bid Auction Values"

Dear Mr. Poschmann:

Thank you for your correspondence of June 29, 2011, regarding the draft paper by Mr. Ben Dachis, Mr. Colin Busby and Ms. Bev Dahlby, provisionally titled "The Capitalization of Alberta's Oil and Gas Royalty Change in Bonus Bid Auction Values."

We appreciate the opportunity to comment on the paper. I would like to preface our response by clarifying that it should not be construed as commenting in any way on provincial royalty regimes. We would not presume to comment on this area of provincial jurisdiction. Instead, our comments focus on some of the economic and methodological issues arising from our reading of the paper. I am attaching comments prepared by my staff, which can be provided directly to the authors. I hope that your authors find them useful.

There is a need for more economic analysis of important energy policy issues, and, in that spirit, I welcome the contribution the C.D. Howe Institute is making with this paper. I hope that we may look forward to more such examinations of important resource policy issues in the future.

Again, thank you for writing.

Yours sincerely,

Serge P. Dupont
Deputy Minister
Natural Resources Canada

Attachment: (1)

Comments on “The Capitalization of Alberta’s Oil and Gas Royalty Change in Bonus Bid Auction Values”

We appreciate the opportunity to review the paper. We have taken necessarily a very rapid read of the paper and have prepared the following comments. We hope that you will find them useful.

We would like to preface our comments by clarifying that they should not be construed as commenting in any way on provincial royalty regimes. Since this is an area of provincial jurisdiction, we would not presume to comment on it. Instead, our comments focus on economic and methodological issues.

You made the point that bonus bids could be thought of as a fiscal policy substitute for royalty income. The paper notes that British Columbia only books bonus bids over nine years, while royalties are booked immediately. This would suggest that a comparison of the two revenue streams should take into account the capital nature of bonus bids versus the current nature of royalties. It was not immediately obvious whether the study, in comparing revenues from bonus bids to royalty payments, was in fact treating bonus bids as capital in nature.

The paper indicates that there is a policy debate over the ideal goal of oil and gas royalty and bonus bid revenues. In particular, on page 2, the paper notes that royalty and bonus bid policy could focus on maximizing activity in the energy sector or it could focus on maximizing revenues. It would be useful if the implications of those two policy goals could be explicitly carried through to other key areas in the paper; for example, if the Government is focused on capturing maximum rents, then it may be more willing to postpone some production to the future. Since much of the paper discusses the impact of future investment on government revenues of bonus bids versus royalties, we believe that this added context might be helpful.

The paper relies on a rather theoretical treatment of oil and gas exploration and production, rather than project cash flow models of a variety of typical oil and gas plays in Western Canada. This is often the way that financial analysts assess a fiscal regime’s impact on project rates of return and profitability. A cash flow modelling approach that incorporates the full cost of a successful project, including land purchases, dry hole costs, development of the successful play, production costs, revenues and project cessation costs, might provide some interesting perspectives on the relative importance of bonus bids versus royalties over the life of the project.

We note that the paper attempts to control for geological factors by comparing bonus bids in a 100-kilometre band along provincial borders. We would expect that a closer look at the geological formations could show different types of plays, and we would not expect the plays on the east of the Rockies to be identical to those on the west. We understood that bonus bids in British Columbia had jumped in certain years because of geological factors—that is, British Columbia's shale plays were more promising than those on the Alberta side of the border. It is not clear to us that the band along the border approach will control effectively for this kind of bias.

Finally, on page 13, the paper indicates that resource royalties directly reduce a firm's profits, dollar for dollar in present value terms, if output remains constant. This is not completely accurate. Royalties are now deductible for tax purposes, hence an increase in royalties is somewhat offset by a reduction in income tax payable, and therefore, profits are not reduced dollar for dollar but rather by approximately \$0.75 per dollar reduction.

Docket / Dossier

N/11-122848

☐

Internal / Internal

☐

External / Externe

JUL 15 2011

Purpose / But

☐

Signature

☐

Information

☐

Decision / Approval
Décision / Approbation

☐

Recommendation
Recommandation

Other / Autre

For / Pour

☐

Minister / Ministre

☐

Deputy Minister / Sous-ministre

☐

Associate DM
Sous-ministre délégué

Other / Autre

Sector / Secteur

Tel. contact

Due: Mon (10:00)
July 11
Date

Subject / Objet

Comments on the Effect of Royalty Rates in Western Canada

Priority / Priorité

(If urgent, state reason / deadline – Si urgent, donner la raison / date limite)

Sector Consulted – Secteur consulté

☐
☐
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AECL Restructuring / Restructuration d'EACL

Audit Branch / Direction de la vérification

Canadian Forest Service / Service canadien des forêts

Corporate Mgt and Services / Secteur de la gestion et des services intégrés

Earth Sciences Sector / Secteur des sciences de la Terre

Energy Sector / Secteur de l'énergie

Innovation and Energy Technology Sector / Secteur de l'innovation et de la technologie énergétique

Other / Autre

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Legal Services / Services juridiques

Major Projects Mgt Office / Bureau de gestion des grands projets

Minerals and Metals Sector / Secteur des minéraux et des métaux

Northern Pipeline Agency / Administration du pipe-line du Nord

Public Affairs and Portfolio Mgt Sector / Secteur de la gestion des affaires publiques et du portefeuille

Science and Policy Integration / Intégration des sciences et des politiques

Approval – Approbation

Director / Directeur

Signature

Date

Director General / Directeur général

Assistant DM / Sous-ministre adjoint

Comments / Commentaires

Podenbach Sultka
W. J. J.
MDH

July 7 2011
July 8
JUL 15 2011

Page(s) 000022 to / à 000063

**is (are) exempted pursuant to section(s)
est(sont) exemptée(s) en vertu de(s)(l')article(s)**

20(1)(a), 20(1)(c), 20(1)(d)

**of the Access to Information
Loi sur l'accès à l'information**

Docket No. / N° du dossier :

D11-122848

Due Date / Date d'échéance :

July 11, 2011

NATURAL RESOURCES CANADA / RESSOURCES NATURELLES CANADA

**EXTERNAL CORRESPONDENCE CONTROL FORM /
FORMULAIRE DE CONTRÔLE DE CORRESPONDANCE EXTERNE**

To / À : ES	
Cc : DM, DMA	
From / De : EDU	
Subject / Objet : REQUEST COMMENTS ON THE EFFECT OF ROYALTY RATES IN WESTERN CANADA	
Date : July 7, 2011	Prepared by : Francine Guenette Préparé par :

☒ Action
☐ Information

☐ Reply / Réponse
☐ Recommendation / Recommandation

To be completed by sector / Réservé au secteur

Prepare / Préparer :

- ☐ Memo for information / Note pour information
- ☐ Memo for action / Note pour action
- ☐ Memo for signature / Note pour signature
- ☐ Memo for decision / Note pour décision
- ☐ Memo for meeting / Note pour réunion
- ☐ Letter / Lettre
- ☐ Other / Autre

For / Pour :

- ☐ Deputy Minister / Sous-ministre
- ☐ Associate DM / SM délégué
- ☐ Other / Autre

Note / Remarque :

- ☐ No reply required / Aucune réponse nécessaire
- ☐ Direct reply / Réponse directe
- ☐ Other action taken or proposed /
Autre mesure prise ou propose

Comments / Commentaires :

Date :

Signature :

Ci. ipagne, Yvette

From: EDU
Sent: July 7, 2011 8:14 AM
To: Champagne, Yvette
Subject: URGENT - Request for comments on the Effect of Royalty Rates in Western Canada
Importance: High

11228-01
w/ 122848
87
3420-11
11029/11

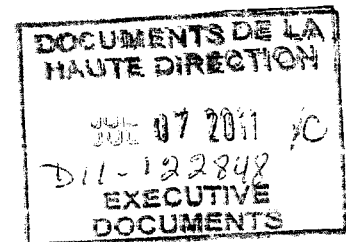
Carmen J

From: DMO-EBU / BSM-UBD
Sent: 2011-07-06 4:02 PM
To: EDU
Cc: ES.SE Ministerial Correspondence-Correspondance ministérielle
Subject: FW: Request for comments on the Effect of Royalty Rates in Western Canada
Importance: High

EDU: please log and send to ES for reply due in DMO by July 11, 2011.

Merci,

Gonviève Lemieux
Briefing Coordinator/Coordonnatrice des briefings
Deputy Minister's Office/Cabinet du sous-ministre
Natural Resources Canada/Ressources naturelles Canada
550 Booth, Ottawa, Ontario K1A 0E4
416-991-0890



From: ES.SE Ministerial Correspondence-Correspondance ministérielle
Sent: July 6, 2011 15:40
To: DMO-EBU / BSM-UBD
Cc: ES.SE Ministerial Correspondence-Correspondance ministérielle; Rau, Michael; Klatt, Pascal
Subject: Request for comments on the Effect of Royalty Rates in Western Canada
Importance: High

Hi Gen,

Please see e-mail trail below, I have searched in CCM but not found anything. Could you please issue a formal request.

Thank you,
Sonya

From: Thomas, Karin Lee
Sent: Wednesday, July 06, 2011 2:23 PM
To: ES.SE Ministerial Correspondence-Correspondance ministérielle
Cc: Brunet, Marie-Claude
Subject: FW: Request for comments on the Effect of Royalty Rates in Western Canada
Hi,
Could we please have a docket number for this request.

000065

2011-07-07

Thanks,
KLT

From: Rollin, France
Sent: July 6, 2011 1:28 PM
To: Thomas, Karin Lee
Subject: RE: Request for comments on the Effect of Royalty Rates in Western Canada

No this did not go through the proper channels, so please go ahead and request a docket number. merci. France

From: Thomas, Karin Lee
Sent: Wednesday, July 06, 2011 13:16
To: Rollin, France
Subject: FW: Request for comments on the Effect of Royalty Rates in Western Canada

Hi France,

We will be drafting a response for this request. Does this request have a docket number? Has it gone through our MCU yet? We will be sharing our response with PRB but it will have to go to the ADM after and nowhere in this message is our MCU involved. Please let me know if there is a number for it or not.

Thanks,

Karin Lee Thomas
for Phyllis Odenbach-Sutton

From: Varangu, Kristi
Sent: June 30, 2011 13:05
To: Odenbach-Sutton, Phyllis
Cc: Brunet, Marie-Claude
Subject: FW: Request for comments on the Effect of Royalty Rates in Western Canada

Phyllis, tell me how you want to proceed. Since DM started this, seems like we should respond.. k

From: Rollin, France **On Behalf Of** Labonté, Jeff
Sent: Thursday, June 30, 2011 12:45 PM
To: Varangu, Kristi
Cc: Rau, Michael; Klatt, Pascal; Leyburne, Drew; Brunet, Marie-Claude
Subject: FW: Request for comments on the Effect of Royalty Rates in Western Canada

Kristi, as per the DM's request below, could you please have someone look at the report and provide appropriate one-page analysis for the DM. Comments should include positive and negative points as well as proposed comments to be sent back by the DM.

Jeff would like the analysis and proposed reply to be routed through our office before ADM approval is sought.

Merci Kristi.

France for Jeff.
France Rollin
Senior Advisor / Conseillère principale
Director General's office / Bureau du Directeur général
Petroleum Resources Branch / Direction des ressources pétrolières
996-3027

2011-07-07

000066

From: Dupont, Serge
Sent: Wednesday, June 29, 2011 17:12
To: Labonté, Jeff
Subject: Tr: Request for comments on the Effect of Royalty Rates in Western Canada

Pls see whether he may have comments.

De : Finn Poschmann [mailto:fposch@cdhowe.org]
Envoyé : Wednesday, June 29, 2011 05:03 PM
À : Dupont, Serge
Objet : Request for comments on the Effect of Royalty Rates in Western Canada

Hello. I am taking the liberty of enclosing a draft by Ben Dachis, Colin Busby and Bev Dahlby, provisionally titled **"The Capitalization of Alberta's Oil and Gas Royalty Change in Bonus Bid Auction Values."** in the hope that you might be willing to review it.

We at the Institute would be pleased to receive any comments you may have. If you are able to respond by **Wednesday, July 13, 2011**, we would be especially grateful. Comments on whatever level, from existential to detailed facts and matters of exposition, are equally welcome. The paper will be thoroughly copy-edited before release.

Please send your comments by mail at kgray@cdhowe.org <<mailto:kgray@cdhowe.org>> , e-mail, or fax - whatever is most convenient for you - and indicate whether you are willing to have them sent directly to the author, or whether you would like them passed on anonymously.

For clarity, the attached is a review draft and we trust that you will not cite or circulate this document; it is not for distribution.

Thank you in advance for your time and expertise.

Finn Poschmann
Vice-President, Research

C.D. Howe Institute
300-67 Yonge Street, Toronto, M5E 1J8
Phone: 416-865-1904; Fax 416-865-1866

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N11-123017

MEMORANDUM TO THE DEPUTY MINISTER

SEP 12 2011

MOBILE DEVICES RECOMMENDATION – APPLE iPad Vs PLAYBOOK

(Meeting of September 14, 2011)

SUMMARY

- The Apple iPad was preferred over the Blackberry Playbook by the vast majority of pilot participants.
- The iPad is an acceptable secured mobile device as long as information is restricted to Protected A and below.
- There are on-going support costs (\$800) associated with these mobile devices and it will take up to three months for the implementation of iPads in NRCan.
- On September 14 (3:30 – 5:00 p.m.), Michel Lessard and I are scheduled to brief you and the ADMs on this issue.

BACKGROUND

In February 2011, NRCan undertook two mobile device pilots with senior managers. The Apple iPad was evaluated first, followed by the RIM Playbook. Similar evaluations were conducted in many other federal departments.

CONSIDERATIONS

Throughout the government, pilot configurations ranged from closed (i.e. the device was essentially stand-alone) to open (i.e. with e-mail and calendaring connectivity). Departments that used open configurations like NRCan reported greater user satisfaction than those who used closed configurations.

At NRCan, participants greatly preferred the iPad over the Playbook. The iPad had a more usable form factor, was easier to use, and had better application support. Both

devices do not support PIN-to-PIN messaging, as the BlackBerry does. The iPad was viewed as a useful complementary tool by the participants. While it was not viewed as essential, most participants would prefer to continue using the iPad. Most Playbook participants expressed the wish to trade their Playbook for an iPad.

From a security point of view, the open configuration is acceptable, providing that information on the devices is restricted to Protected A and below. The open configuration is as secure as an NRCan laptop outside of the NRCan network. Both the iPad and the Playbook offer similar levels of security. Certification and Accreditation will have to be done for this device.

Support for mobile devices is not insignificant. It represents an additional device to provision and maintain. Data from the pilot project estimates that each device costs approx. \$800 per year in support, in addition to the cost of the device itself. Processes for application (Docs to go, GoodReader, etc.) acquisition and management will need to be developed for this device.

In addition, the iPad must be configured with a cellular 3G connection at a cost of \$22.83 per month, cost that is included in the wireless contract transferred to Shared Services Canada. Many participants incurred significant roaming charges (USA and international) during the pilot.

CONCLUSION

The iPad is a viable business device for mobile users. The CIO recommends approving the iPad with an open configuration as a supported device for NRCan.

The deployment of iPads will require the development of processes for acquisition, application management, configuration and usage, as well as device support (budget transfer of \$800 annually per device, excluding acquisition costs), which should be completed within Three months following management approval.

The RIM Playbook is not recommended for implementation at this time.


Bill Merklinger, ADM-CMSS and CFO

Contact: Michel Lessard, CIO, (613) 943-0469
DG-IMB, CMSS

Docket / Dossier **123017**

☒ Internal / Internal ☐ External / Externe

Purpose / But

☐ Signature ☒ Information ☐ Decision / Approval
Décision / Approbation

☐ Recommendation
Recommandation ☐ Other / Autre

For / Pour

☐ Minister / Ministre ☐ Deputy Minister / Sous-ministre

☒ Associate DM
Sous-ministre déléguée ☐ Other / Autre

Sector / Secteur

CMSS

Contact:
(name/nom - tel.)

Michel Lessard
943-0469

Due Date / September 12,
Échéance 2011

Subject / Objet

Mobile devices

Priority / Priorité

(If urgent, state reason /deadline – Si urgent, donner la raison / date limite)

Sector Consulted – Secteur consulté

☐ AECL Restructuring / Restructuration d'EACL
☐ Audit Branch / Direction de la vérification
☐ Canadian Forest Service / Service canadien des forêts
☒ Corporate Mgt and Services / Secteur de la gestion et
des services intégrés
☐ Earth Sciences Sector / Secteur des sciences de la Terre
☐ Energy Sector / Secteur de l'énergie
☐ Innovation and Energy Technology Sector / Secteur de
l'innovation et de la technologie énergétique

☐ Legal Services / Services juridiques
☐ Major Projects Mgt Office /Bureau de gestion des grands
projets
☐ Minerals and Metals Sector / Secteur des minéraux et des
métaux
☐ Northern Pipeline Agency / Administration du pipe-line du
Nord
☐ Public Affairs and Portfolio Mgt Sector / Secteur de la gestion
des affaires publiques et du portefeuille
☐ Science and Policy Integration / Intégration des sciences et des
politiques

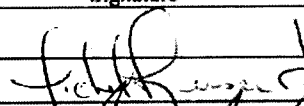
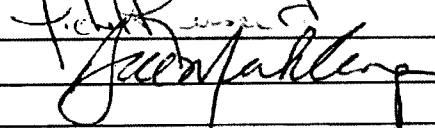
Other / Autre

TBS; iPad/Playbook users

Approval – Approbation

Signature

Date

Director / Directeur		
Director General / Directeur général		2011/09/09
Assistant DM / Sous-ministre adjoint		Sept. 10/11
Comments / Commentaires		



MEMORANDUM TO THE DEPUTY MINISTER

SEP 13 2011

REPORT ON THE GROWTH OF THE EX CADRE

(Information by September 15, 2011)

SUMMARY

- Office of the Chief Human Resources Officer (OCHRO) produced a draft report examining reasons for the growth of the EX cadre in the Public Service. The report will be presented to Committee of Senior Officials (COSO) in the fall 2011 (Tab 1).
- The information below is a preliminary overview of the conclusions.

BACKGROUND

The attached draft report has been produced by OCHRO in consultation with departments and agencies to address concerns and interests of Deputy Heads regarding the growth of the EX cadre in the Public Service. The report will be finalized and presented to the COSO in the fall 2011.

The report examines a number of aspects, including: trends, comparison of departments within the Core Public Service (CPS) to Separate Agencies; projections for growth; changes in the nature or work; and the impact on the priorities on growth; demographic and linguistic factors; the impact on or by, designated groups; the impact of increased accountabilities, turnover and mobility.

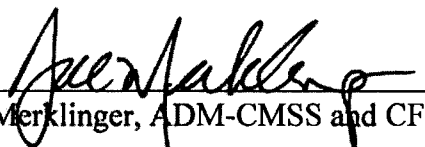
General highlights include:

- The number of EXs has grown faster than the total number of employees. Over a 27 year period (1983 – 2011) there has been an increase of 50%. Separate Agencies have grown by 5.5 times in the same period.
- The growth in the EX cadre is cyclical and is impacted by: the changing nature of work; growth in expenditures for which they are responsible; increased accountabilities for human and financial resources; and increased number of specialized EX managers (e.g., HR, audit and finance).

- The growth appears to be in the right direction given the changing nature of work. The issue is more likely the size of the EX cadre rather than its growth. Trends indicate that growth in the EX cadre leads growth in the number of employees. If there is a goal to reduce the number of employees then strong growth in the EX cadre would be seen as negative.
- If comparing the growth within the CPS to Separate Agencies, trends are similar at the EX 1 and 3 however there is significantly more growth in Separate Agencies at the EX-02, 4 and 5 levels. This may be attributable to the greater autonomy of Separate Agencies than that of the CPS. The growth may be artificially constrained at the EX-4 and 5 levels in the CPS (where the baselines are centrally controlled) but not at the EX-03 level where departments have more flexibility. It would also appear that the growth within the CPS is not too high.
- Noteworthy is the opportunity provided through the growth to increase the representation of designated groups: a result of the increase and not a cause, but a success story.

Of specific interest is the comparison of NRCan to other organizations within the CPS:

- NRCan is not identified as a department having experienced a significant growth in its EX cadre, (page 10, and Figure 5a, 5b). Much of the EX growth is seen to take place in departments doing high priority work.
- In the period 2000 to 2010, NRCan's percentage changes in the number of EXs and in the number of non-EX employees per EX appears to be in the mid-range when compared to selected larger departments (Page 8).
- Data presented for CPS organizations of 500 to 4999 employees indicate an increase in the EX cadre of 45% and a decline in employees per EX of approximately 28% over a ten year period. NRCan statistics appear to be in line with the CPS (Page 8).
- NRCan's EXs as a percentage of all employees is average at 3.5 % (figure A4 Annex A).
- When compared to science based departments of a similar size, NRCan has a slightly larger EX cadre.
- NRCan's total non-EX employees per EX is in line with the average at approximately 1:38 (figure A5 Annex A).


Bill Merklinger, ADM-CMSS and CFO

Attachment: (1)

Contact: Lynne McHale, (613) 947-8243
HRSMB/CMSS

GROWTH IN THE EX CADRE 11-05-2011: A BACKGROUND PAPER

(Peter Hicks, June 16, 2011)

PURPOSE AND CONTENTS

The purpose of this deck is to explain the reasons for the growth of the EX cadre in the Core Public Administration, particularly why that growth exceeds the growth of total employment in the CPA. The deck was prepared in response to a request from the Committee of Senior Officials.

EXECUTIVE SUMMARY

WHAT IS THE ISSUE?

1. Trends in the size of the EX population
2. Do comparisons, including with separate agencies, suggest a problem?
3. Will the growth continue? Projecting ahead.

LEGITIMATE FACTORS THAT CAN CAUSE GROWTH

4. Can the growth be accounted for by changes in the ongoing nature of the work?
5. Do the trends simply reflect changing government priorities?

EXPLORING POSSIBLE INTERNAL FACTORS THAT MIGHT HAVE CAUSED CHANGES

6. Has the concentration of growth in designated groups affected overall growth?
7. Have changing demographic and linguistic characteristics had a role to play?
8. Have changes in turnover rates affected the size of the EX cadre?
9. Have there been any changes in EX spans of control that made a difference?
10. Is the concentration of growth in the National Capital Region important?
11. The way in which the word 'executive' is defined makes a big difference.
12. A review of possible explanations that have been suggested, but that do not stand up to closer examination (acting appointments, double banking, departmental size, reorganizations, classification creep)

CONCLUSIONS

13. Conclusions and further work

ANNEXES

- A. Departmental data
- B. Some interesting comparisons using census data

NOTES

What this draft is, and isn't

- It is
 - A working draft of a background paper that will eventually support a COSO presentation
 - A reasonably comprehensive picture of the growth and size of the EX cadre that can be used as a resource for various purposes
- It is NOT a draft of the COSO presentation itself which will be much shorter and with a single storyline

Data sources

The data in this report are primarily drawn from the central pay system, using March data for the year in question. This is the most accurate source of consistent data for the whole CPA and is the basis of most central reporting of this sort. It may differ somewhat from internal departmental data.

Other data sources are also used when appropriate and these are clearly identified in the text

The report was commissioned by Yasmine Laroche (give title) and prepared under the direction of Peter Hicks during the winter and spring of 2011.

Acknowledgements

Many thanks to the invaluable help received from employees from the Office of the Chief Human Resources Officer (OCHRO), Treasury Board Secretariat (TBS) for their expert advice throughout the project. Two teams from OCHRO were assigned to the project on a part-time basis to provide support. Assistant Deputy Ministers Yasmine Laroche and Ross Macleod reviewed the text and commented on the report. Bianca Bertrand, who led a team, read, commented and provided editorial services; Lucie Proulx managed the logistics and provided editorial services while Simon Prigent was active in designing most of the figures and tables in the report as well as contributing to the research.

A second team provided data and data analysis. Stevan Zonjic was the key figure in gathering and providing the data required and commenting on the findings. George Domaradzki also read, commented and validated findings brought forward in the report. Émile Allie worked closely with Robert Kopersiewicz from Statistics Canada in conducting workforce analysis, historical trend analysis and a projection analysis of the executive group.

Departmental representatives were also most helpful during the validation exercise.

EXECUTIVE SUMMARY

The EX cadre in the Core Public Administration (CPA) has been growing at a faster rate than that for all employees. In the absence of change, that growth is expected to continue but at a reduced rate. Much of the growth results from the evolving nature of the work of EXs.

- While the EX growth may have exceeded that of all employees, it is in line with the growth of the professional workers that are the focus of the work of many EXs. More generally, the work force has become more complex with growth of knowledge workers and declines in less skilled occupations.
- As well, EX growth has been in line with the growth of the expenditures for which the EX cadre is ultimately accountable.
- Moreover, the accountabilities of EXs for both human and financial resources appears to have grown in recent years, including the addition of more specialists EX managers in areas such as finance, audit and HR.

Other factors, such as responding to specific government initiatives and to a wide range of internal HR factors, have played a role in some departments, but appear to have had little overall effect at the level of the CPA as a whole. Many internal factors were examined, including those related to:

- EX demographic characteristics.
- Organisational changes.
- HR policy factors.
- Designated groups, a major success story that was enabled by EX growth, but that did not cause it.

EX growth appears to have been in the right general direction, when taking account only the nature of the work. Whether that growth has been too high, too low or about right is best determined through comparisons with similar organizations.

- Unfortunately, our HR data is very weak in enabling proper comparisons. The only group with which the CPA can reliably be compared to is the separate agencies.
- The growth of executives* in the separate agencies has been stronger than in the CPA, especially at the EX-02 and ADM levels.
- If greater HR autonomy leads to better HR decisions, this suggests that CPA growth may have been overly-constrained -- suggesting in turn that there should be consistent delegation to departments for all EX decisions, including at the ADM level. However, as noted below, it is likely that the real interest is in the size of the EX cadre, not its growth rate.

The paper concludes that the growth of the EX cadre did not prove to be, in itself, an especially interesting topic. It does not point to any obvious action -- although it does highlight a number of partially-related HR challenges and success stories (such as increasing the representation of designated groups in the executive population) that are described in the paper.

- Likely of more interest are questions about size of the EX cadre, not its growth.
- The area of real interest should be on the size and growth of different types of managers -- and the EX group is a very poor proxy for this kind of occupational analysis.
- The paper makes observations on some possible next steps in carrying out more relevant analysis of this sort.

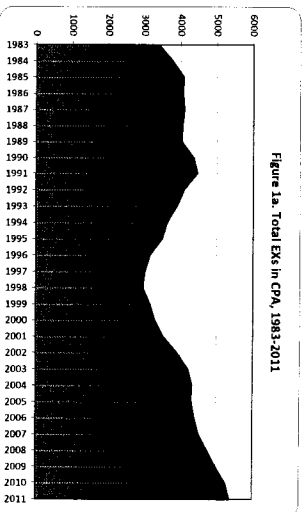


Figure 1a. Total EXs in CPA, 1983-2011

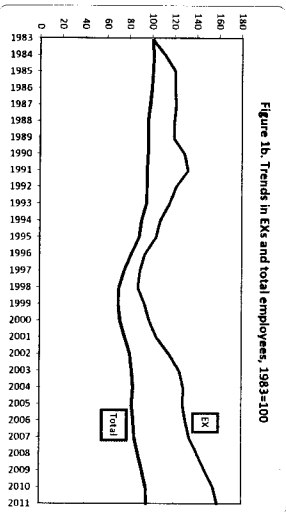


Figure 1b. Trends in EXs and total employees, 1983-100

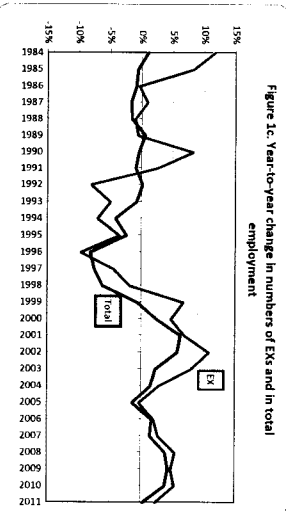


Figure 1c. Year-to-year change in numbers of EXs and in total employment

* All the data on this page is for the Core Public Administration, including Credit Services, Agency and Student Services, and the predecessor organizations for CPA, in order to ensure year trends. As well as adjustment, the same data includes data prior to 1992. The data, based on central pay records, reflect the active population, all figures (including averages) as of March 31st of any given fiscal year. The data are shown for 1983 to 2010.

1. Trends in the size of the EX population

- **Figure 1a** shows the growth in the number of EXs from 1983 to 2011
 - There was growth in the 80s followed by cut-backs and reductions in the first half of the 90s, and more deeply in the mid 90s
 - There has been steady underlying growth since the mid-to-late 90s
 - Some factors that have influenced the size of the ex population include Program Review, delegation of EX-01 to EX-03 classification authority and safety and security issues.
 - In the early 2000s, the increases levelled off, but started growing more strongly after 2005, a period associated with a renewed concern for the demography of the public service and with excellence, including in hiring practices

- **Figure 1b** shows the same data for EXs but converted to an index number form where 1983 is set to equal 100. The growth trend is compared with that for all Core Public Administration (CPA) employees
 - The growth of EXs has been higher than that for public servants as a whole, particularly since the mid 90s

- The graph also shows a significant decline in size in the period of the early 90s, well before that of the CPA as a whole, and before program review. Much of this decline during the early 90s reflected budgetary and staffing restrictions. However, nearly half of the decline in the period 1990 to 1993 is a result of changes in the classification system. In the period before 1993, the data shown here reflect two senior management groups SMs and EXs. During that period, most SMs were converted to EXs, but some (about 300) were converted to other categories, which of course exaggerated the decline in the overall total number of senior managers, taking both EXs and SMs into account.

- **Figure 1c** uses the same data but cast in the form of percentage changes from the preceding year
 - Generally, the movements in the EX population roughly parallel those in whole public service, but are more extreme
 - In times of expansion and contraction, EX changes tend to lead

- The breakout by EX levels in the charts to the right show
 - In the period up to the mid 90s, **Figure 1a** suggests that the overall trends were driven by EX1s who had increased most rapidly in the 80s and who were most affected by program review. (However, some of the decline in the early 90s reflects the inclusion of all SMs in the data for those years.)
 - On the other hand, since the mid 90s, **Figure 1f** suggests it has been the growth of EX-03s and, to a lesser extent, the EX-02s that have been the main drivers of change. (EX-01s fell gradually as a percent of the total during this period.)

CONCLUSION. EX Growth reflects an underlying cyclical pattern

- Declines in the 90s due to Program Review were likely too deep to be sustainable) were followed by compensatory growth in the late 90s and early 2000s. It is reasonable to assume that part of the growth that occurred in the late 1990s was to compensate for this decline, however, other factors may also have contributed to the growth.
- This was, in turn, followed by a levelling off and then stronger growth after 2005
- A question addressed in this doc is whether this more recent growth reflects changing realities, or whether it was too strong -- suggesting the need for compensatory reductions in the future

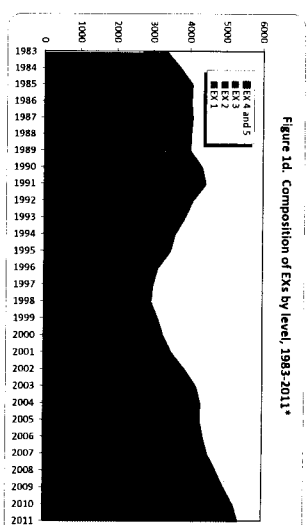


Figure 1d. Composition of EXs by level, 1983-2011*

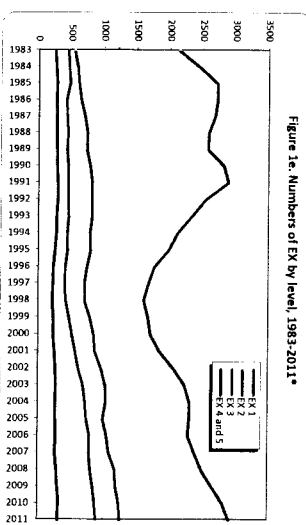


Figure 1e. Numbers of EX by level, 1983-2011*

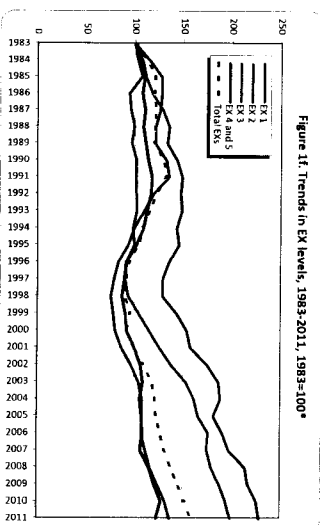


Figure 1f. Trends in EX levels, 1983-2011, 1983=100*

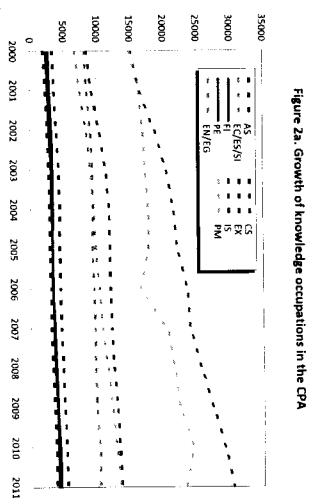
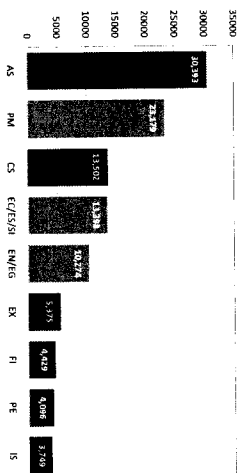


Figure 2a. Growth of knowledge occupations in the CPA

Figure 2b. Size of largest knowledge occupations, CPA, 2011



Note: As will be explained later in Section 11, the use of the word 'executive', known in the CPA universe as the EX-01 to EX-05 population, refers to an internal classification system that is used for salary purposes; this EX classification system does not have any close counterparts outside the Government of Canada. In this paper we use the term 'executive' in this sense. However, the term 'executive' is sometimes also used loosely as a proxy for 'senior managers', an occupational classification that is more widely used throughout Canada, including in the Census and Statistics Canada surveys. Indeed, comparative analysis should properly be based on occupations, not internal pay/classification systems. This would allow comparisons with other employers and comparisons of senior managers with other types of managers and specialist managers. Unfortunately the EX grouping is a weak proxy for senior managers, since it includes most (but not all) senior managers (i.e. Deputy Ministers), some middle managers and specialist managers. Moreover, as will be noted later, while our internal human resources files do include the potentially more useful occupational information, the quality of that data is so poor that they are useless for most purposes.

* See notes on Page 2 for an explanation of the data sources. The large knowledge occupations shown are: AS (Administrative Services), PM (Program Administration), CS (Computer Systems), EC/ES/SI (Economics and Social Science), EN/EG (Engineering and Engineering Support), EX (Executive), R (Human Resources), PE (Finance) and IS (Information Services).

2. Do comparisons, including with separate agencies, suggest a problem? *

The charts on the preceding page showed that growth in the number of executives has been higher than for all employees. The comparisons on this page are intended to give a sense of the scale of EX growth that has occurred. However, they do not indicate whether that growth is too high or too low.

Figures 2a and 2b compare EXs with other knowledge occupations in the CPA.

The growth of EXs has been quite flat compared with other large groups of knowledge occupations and, of course, the EX group is among the smallest of the most populous knowledge occupations

Figure 2c shows comparisons with Australia and the UK, two of the few countries where some consistent comparisons seemed possible. However, even here, there may well be problems of data consistency. Earlier work in attempting to collect comparable data from provinces and territories was abandoned because of problems of inconsistent data.

Figure 2d uses data from the Labour Force Survey to compare the growth of the number of executives in the CPA (the heavy black line), with other roughly similar occupations

- EX growth since 2000 has been greater than that for all managers in Canada as well as for all senior managers (the green and red dotted lines)

- It has been similar to the growth for professional occupations in the private sector (blue dotted line)

Figure 2e makes a similar comparison that shows that EX growth in the CPA is in line with, or a little higher than, many macro indicators -- population growth, GDP, and public administration at all levels of Government.

Comparisons with the Separate Agencies are the most reliable

The work of EXs in the Core Public Administration (CPA) is roughly similar to that of executives in the separate agencies that are also part of the Federal Public Service (FPS) -- and is one of the few comparisons that can be based on solid data.

The charts on the next page explore these comparisons

* There is no single definition of the word 'executive' that can be applied to the CPA and separate agencies. Executive group salary bands from CPA were used as the basis to establish equivalent population of senior employee levels in separate agencies.

Figure 2c. Recent growth rates in Australia and UK

There are no reliable international comparisons. The following numbers were obtained through correspondence. Subsequently there have been major reductions in the UK.

- Australia (from 2000 – 2009)
 - o 72% executive growth
 - o 43% growth of overall public service
- United Kingdom (from 2000 – 2008)
 - o 40% executive growth
 - o 10% growth of overall public service
- Canada (from 2000 – 2009)
 - o 50% executive growth
 - o 25% growth of overall public service

Figure 2d. Labour Force Survey Trends for all Canada compared to CPA levels, 2000=100

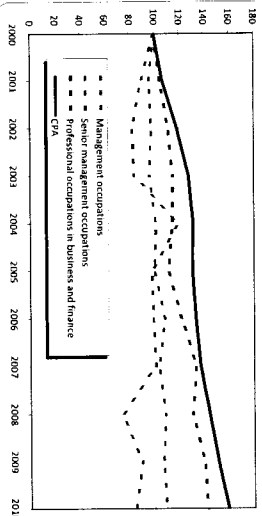
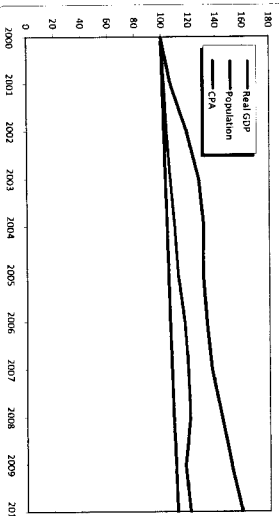
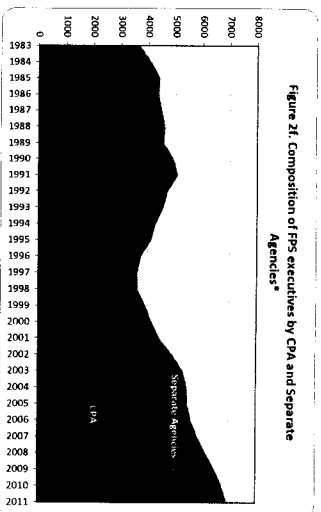


Figure 2e. CPA vs. Real GDP and Canadian Population, 2000=100



2 continued. Do comparisons, including with separate agencies, suggest a problem?

- Figure 2f shows changes in the composition of the FPS executive since 1983. The separate agencies are shown in blue at the top of the chart and the CPA departments in burgundy



- Figure 2g uses the same data, but in the form of index numbers (where 1983 data is set to equal 100) in order to highlight the different patterns of growth

- The CPA numbers reached 156 points by 2010, a growth of a little over 50% over this 27 year period
- The separate agencies grew by 5 ½ times in the same period – to 558 points; further analysis would be required to identify causes.

- A potential problem in using data for the total of the separate agencies is that it is dominated by one agency -- CRA. The charts to the right add a separate line (the blue dotted line) for the total of 'Selected Separate Agencies*' which excludes CRA, small agencies and those that have changed their organizational boundaries between 2000 and 2010

- The charts on the right also show trends for a much shorter period, 2000 to 2010. In this recent period:

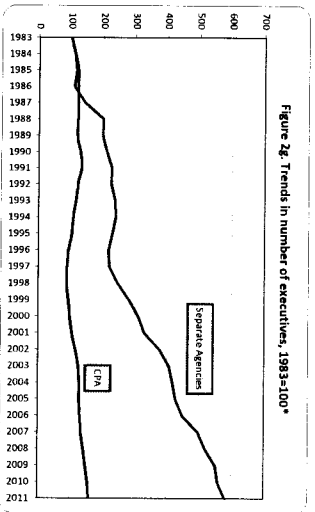
- Growth in separate agencies was much higher at the EX-02 level and among EX-04s and 05s
- The trends were similar for EX-01s and EX-03s
- The medium-sized separate agencies have, in fact, similar patterns to the CRA-dominated total.

CONCLUSION. When compared with areas that are at least superficially related in some fashion, the recent growth in the number of executives is seen as large, but not exceptional
A real problem is that the data to make good comparisons is very weak -- a problem that is fixable in the longer-term, as will be described later.

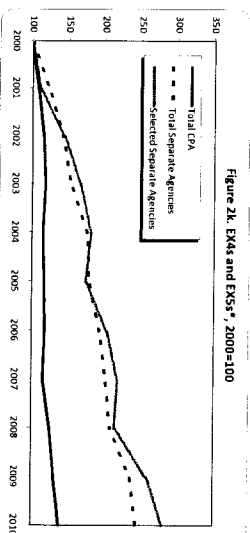
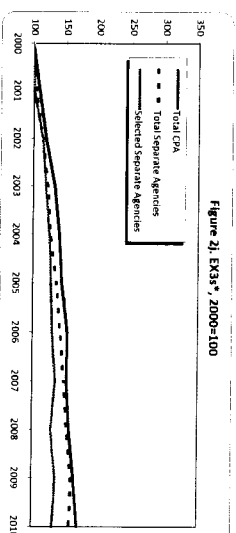
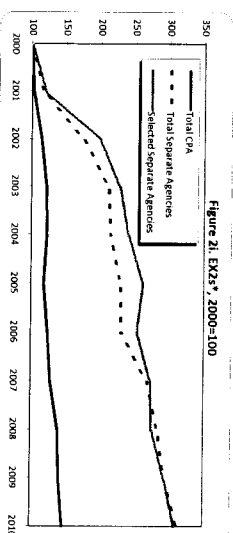
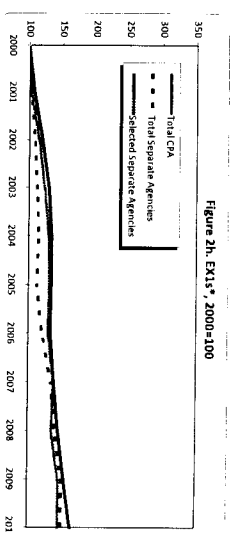
The greater autonomy in the separate agencies and the manner in which 'executive' was defined for comparison to CPA may impact on the higher growth levels in separate agencies.

Where legitimate comparisons are possible (i.e., with separate agencies), the results seem to suggest that recent EX growth has NOT been too high

- Indeed, if greater autonomy over HR decisions is assumed to result in more rational decisions, the data might even suggest that recent CPA growth may have been overly-constrained
- There may have been underutilization at the EX-02 level
- At more senior levels, CPA growth may have been artificially constrained at the EX-04 and EX-05 levels (where central approval is needed) but not at the EX-03 level (where departments have more flexibility)
- However, an alternative conclusion is also possible
- If changes in the size of the EX cadre tend to lead changes in the overall size of the CPA (as suggested in Section 1)
- and if reducing the size of the Public Service is seen as a desirable policy goal at this time, then the lower growth in the CPA could be seen as being positive



*In this page all data for Canada Revenue Agency and Border Services (and the predecessor organizations for CRA) are included with data for separate agencies and excluded from the CPA data. The data reflect the active population, all revenues (including activities) as of March 31st of any given fiscal year.
The data are for EXs in the CPA and equivalent levels in the separate agencies.
The 'Selected Separate Agencies' include Parks Canada, Communications Security Est, NRCC, Food Inspection Agency, SSIHC, National Energy Board, NSERC, Institutes of Health Research (and MRC), National Film Board, Superintendent of Financial Institutions, Auditor General.



3. Will growth continue? Projecting ahead

Figure 3a. Projection of EX Group, 2005-100

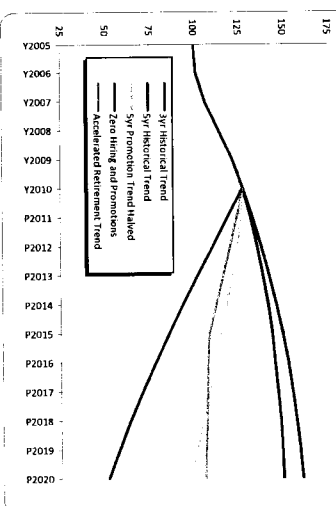


Figure 3b. Projection of EX Minus 1, 2005-100

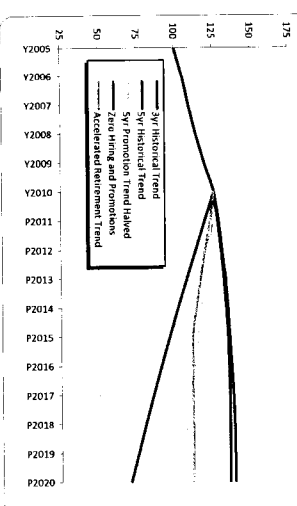
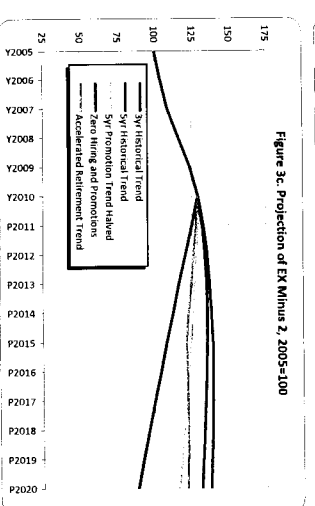


Figure 3c. Projection of EX Minus 2, 2005-100



Projection Results

Five scenarios for the future were examined, as described on the next page.

In two of the scenarios (the 3yr and 5yr Historical Trend scenarios), we allowed the number of executives to continue to grow over the next ten years, in one case at the rate of the past three years, and the other at the rate of the past five years.

- These are the two highest lines in Figure 3a. These lines, and those for the other projections are presented in the form of index numbers, with 2005 set to equal 100. This provides a focus on the differences among the scenarios in terms of trends
- The five year historical trend is a little lower, and we will use it as a baseline in other comparisons

The next scenario shown in Figure 3a (5yr Promotion Trend halved) cuts the promotion and hiring rates in half over the next 10 years, when compared with the five year trend.

- When the 5yr Promotion probabilities are halved, the EX Group shows a significant decline in employment.
- As this scenario was being designed, it was necessary to adjust promotion probabilities at the EX Minus 1 and the EX Minus 3 to EX Minus 2 by an equal amount to avoid creating significant growth in the employment levels at the EX Minus 1 and EX Minus 2.
- In practice such a scenario would likely be realized by simply controlling total expenditures

The next scenario results in a more draconian cut, one where hirings and promotions at EX and EX minus 1, minus 2 and minus 3 levels are all set to zero. This would almost certainly prove to be unsustainable in practice.

The final scenario (Accelerated Retirement scenario) illustrates that retirements can be accelerated by increasing the likelihood of employees taking their retirement sooner.

- This scenario assumes that those with fewer years of service would receive a financial incentive to leave earlier.
- The decline is sharper in the earlier years because of the increase in retirements.
- In practice, this scenario would likely be used in a combination with expenditure cuts (in order to reduce promotions) plus cash-out incentives, perhaps similar to those used in program review in the 90s

Figures 3b and 3c show comparable results for the EX minus 1 and minus 2 levels. It is important to note that EX hiring from external (e.g. private sector) is very low. The mobility into the EX group is primarily from the EX Feeder Groups (e.g. EX Minus 1). This means that a hiring based strategy for reductions must necessarily affect all senior levels below the EX level as well.

Years in position level

The scenarios would have strong effects not only on numbers of employees, but also on the length of time people would stay a particular level. This can be seen in the table on the next page

- At most levels, the time spent at the same level will increase in the 5 year growth scenario. For example, people now average 3.9 years at the EX-03 level. This will increase to 4.2 years in 2015 and to 4.8 years in 2020 under this scenario
- Under the scenario that involves a 50% cut in the rate of promotions, length of time at the same level (and often in the same position) would increase sharply -- to 5.4 years in 2015 and 6.9 years in 2020 for EXs

There would also be small effects on average lengths of time spent in the public service and on average ages.

CONCLUSION.

Employment in the EX Group can be slowed or reversed by reducing the number of promotions from EX Minus 1 into the EX cadre. This must also be followed by similar reductions in the EX Feeder Groups or they will also continue to grow.

When promotion rates are reduced, the length of time at each level (e.g. years at EX Minus 1 classification) increases since fewer employees are promoted to the next level. Halving promotion probabilities increases years at level by about 1 year on average every 5 years.

3 continued. Will growth continue? Projecting ahead

The table below provides the details of the projection results for the 5-year projection and for the 50% cut in hirings and promotions

Group	Level	Age			Years at Level Position						Years in Public Service						Employment					
		2009-10	Long Term Trend	2019-20	2014-15	2019-20	2010	2015	2020	Long Term Trend 50% Promotion Rate	2009-10	Long Term Trend	2019-20	2014-15	2019-20	2010	2015	2020	Long Term Trend 50% Promotion Rate			
EX	1	48.2	49.0	50.2	50.0	51.6	4.1	4.4	5.4	5.7	7.5	19.7	18.7	18.8	20.0	20.3	21.9	25.05	21.55			
EX	2	50.3	50.4	51.2	51.5	52.8	3.7	3.8	4.5	5.1	6.5	22.2	20.6	20.1	22.0	21.9	11.90	13.78	14.47			
EX	3	51.5	52.2	52.8	53.1	54.5	3.9	4.2	4.8	5.4	6.9	22.7	22.4	21.7	23.2	23.0	8.25	9.74	10.53			
EX	4	52.3	53.3	54.0	54.1	55.5	3.5	3.4	3.8	4.8	6.0	24.8	23.8	23.0	24.9	24.2	2.14	2.80	2.45			
EX	5	53.3	54.4	55.4	54.9	56.7	3.2	3.7	4.7	4.9	6.7	24.0	24.0	23.5	24.7	23.6	97	141	166			
EX	Total	48.5	50.2	51.2	51.1	52.5	3.8	4.2	5.0	5.5	7.1	21.1	20.1	19.9	21.3	21.3	5078	5715	5951			
EX Minus 1		47.8	48.7	50.0	49.5	51.1	5.9	6.5	7.7	7.7	9.5	17.3	17.4	18.0	18.2	19.0	11431	12331	12326			
EX Minus 2		44.6	46.2	47.5	46.6	48.3	5.1	6.2	7.7	7.1	9.1	14.2	14.8	15.4	15.3	16.2	19304	20178	19571			
EX Minus 3		42.6	44.2	45.0	44.4	45.6	4.9	6.7	8.3	7.2	9.1	11.0	12.6	12.7	12.8	13.3	26000	23984	21947			
																		24938	23758			

Projections Scenarios: Definitions

- Five scenarios were generated to look at the effects on employment levels of the EX Group and the EX Feeder Groups.
- 3Yr Historical Trend: Projection event probabilities were calculated based on the observed historical mobility from 2007-08 to 2009-10.
- 5Yr Historical Trend: Projection event probabilities were calculated based on the observed historical mobility from 2005-06 to 2009-10.
- 5Yr Promotion Trend Halved: 5-year Promotion probabilities were halved. All other probabilities were based on the 5Yr Historical Trend scenario.
- Zero Hiring and Promotions: Hiring and promotion probabilities were set to zero. All other probabilities were based on the 5Yr Historical Trend scenario.
- Accelerated Retirements: The Retirement probability for the 30-34 years of public service group was set to the same level as the 35-39 group for employees aged 55-59, for a period of five years. After which, the retirement probabilities were returned to the 5Yr Historical Trend and promotion rates are set to maintain constant the employment level

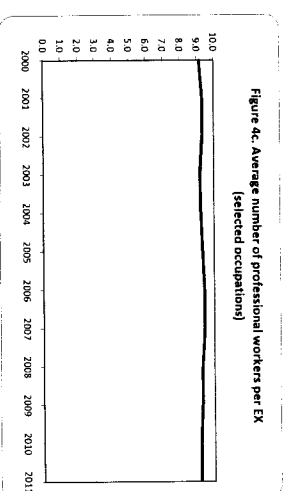
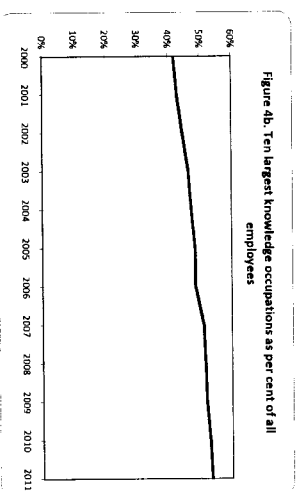
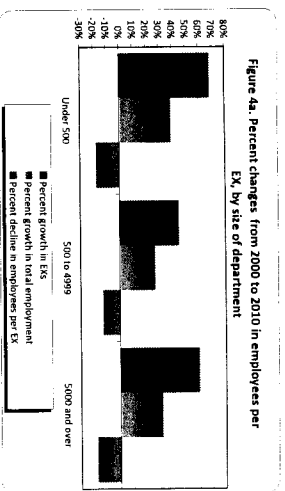
Source of Projections Data

Data Source: Public Service Commission, Job-Based Analytical Information System (JAIS). JAIS is a longitudinal employee dataset that contains information on appointments within the PS&A universe. JAIS was used to calculate the historical event probabilities, historical employment levels and the starting employment for the projection scenarios.

Model used: PERSIM (short for Personnel Simulation Model) is a demographically driven microsimulation model designed to estimate gross flows, staffing levels, career progressions and an organization's demographic structure (e.g. age and experience profiles). The projection assumptions are defined through four events: retirements, other exits, promotions and hiring.

PERSIM Training Program: This project was completed as part of this training program. The historical analysis and projections were completed by the participant and the program instructor. (Participant: Émile Allie, Senior Advisor, Governance, Planning and Policy Sector, Office of the Chief Human Resources Officer, Treasury Board of Canada Secretariat. Telephone 613-957-2219. Instructor: Robert Kopersiewich, Program Manager, Centre for Workforce Analysis and Forecasting, Human Resources Infrastructure Division, Statistics Canada. Telephone 613-951-6662)

The Centre for Workforce Analysis and Forecasting was created in 2006 based on PSMA funding. The Centre conducts workforce analytical studies and employee survey analysis on the federal public service workforce on a cost recovery basis. For more information, please contact Robert Kopersiewich.



4. Has the work of executives changed?

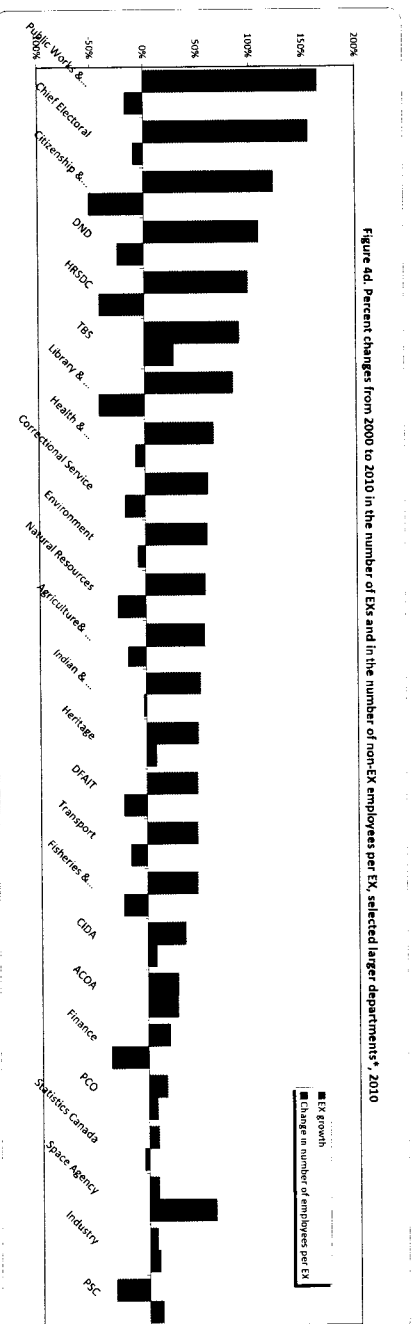
- It may be that EX growth exceeds that of all employees because the nature of EX work has become more challenging, requiring more EXs in total. This section explores
 - Changes in the number of employees coming under the direction of executives
 - Changes in the complexity and knowledge-intensity of the work that is ultimately being directed by executives
 - Changes in the amount of financial resources for which executives are ultimately responsible
 - Changes in the extent to which executives are accountable for those financial and human resources

Number of employees per EX

- Figure 4a explores the growth in the numbers of EXs and the fall in numbers of employees per EX by size of department
 - Between 2000 and 2010, the growth in both EXs and total employees was highest in the smallest departments and, to a lesser extent, in the very large departments. (Note that underlying data include only agencies that existed in both time periods, thereby reducing the effects of startups on the size of the executive group.)
 - In consequence, the fall in the number of non-EX employees per EX was widespread -- a little less in the medium-size departments
- Figure 4d, at the bottom, shows the data separately for larger departments, expressed in terms of percentage changes from 2000
 - Nearly all departments experienced a rise in EXs and a fall in employees per EX
 - Differences among departments however are large, in some cases reflecting changes in government priorities, a topic discussed in the next section

The complexity of the work: knowledge workers and professionalism

- A reasonable hypothesis is that a reduced number of employees per EX makes sense since the nature of the work being done is becoming more complex, requiring more executive oversight -- with a reduction in the lower skilled jobs that require little oversight at the executive level
- Figure 4b shows that there has been a steady but large growth in percentage of employees who are knowledge workers**. The percent of employees in the 10 largest knowledge-intensive occupations has grown from about 42% in 2000 to 53% currently -- a large, steady rise
 - Figure 4c examines trends in the number of professional workers*** per EX and finds this average has been flat throughout the past decade. That is, the growth of EXs is quite in line with growth of the more skilled, professional employees under their direction



* See section 5 for definitions used in Figure 4d
 ** Knowledge workers include those in systems, economics, engineering and scientific support, Finance, HR, Information, AS and PM as well as EXs
 *** Professional workers include those in systems, economics, engineering and scientific support, Finance, HR and Information

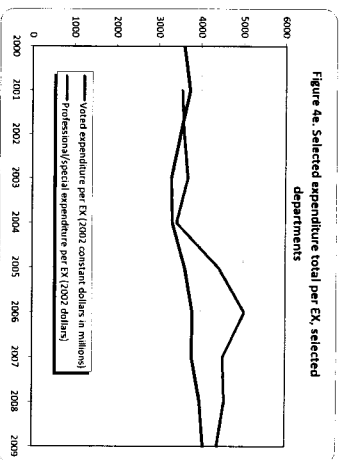


Figure 4e. Selected expenditure total per EX, selected departments

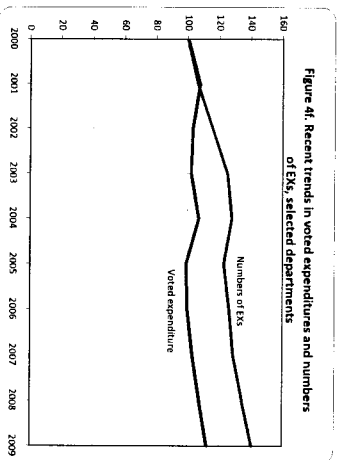


Figure 4f. Recent trend in voted expenditures and numbers of EXs, selected departments

4 continued. Has the work of executives changed?

EX growth is consistent with changing patterns of expenditure

- Figure 4e shows two recent expenditure trends
- Voted expenditures include the total of operating/program expenditures, grants/contributions, and capital expenditures. These are expressed in millions of constant 2002 dollars per each EX in the selected departments.
- Professional and special expenditure per EX. These are internal expenses such as contracts, temporary help, conferences, computer services etc. They are expressed in actual 2002 dollars per EX (unlike the first figure which is expressed in millions of dollars)
- The EX numbers and the expenditures are for the same larger departments shown in Figure 4d except that DND is excluded (the expenditure data includes military spending) as is HRSDC (where statutory spending, which is not covered in these numbers, plays such a large role)

- Figure 4e shows that external spending per EX has been reasonably steady since 2000, which suggests that EX growth has been about in line with the public spending for which the executive group is responsible
- The figure also shows a rise in internal spending per EX for things like contracts, consultants, temporary help, etc. a growing area of expenditures that in some ways are similar to internal wage and salary spending
- Figure 4f uses the same data as above, but expressed as index numbers (with 2000 set to equal zero) showing trends in EX growth and in the growth of voted expenditures. Basically it shows that the recent growth was in the first half of the last decade. Trends in the past five years have been very similar

Accountability increases among EXs generally

The Federal Accountability Act and other central rules and expectations have resulted in large increases in the level of accountability of the EXs for the resources, human and financial, under their control. There are no empirical data that can assess the extent to which this has created pressures towards increasing the size of the EX cadre (i.e., sharing the increased responsibilities among more people.)

Informal discussions with knowledgeable people in COSO represented departments suggests that changes are real, but there is no evidence that they have resulted in an increased number of EXs, apart from the specialist managers who have special responsibilities for finance, etc.

Growth of specialist EXs

- Unlike its effects on EXs in line positions, there is evidence that the new emphasis on accountability has increased the number of specialist managers in areas such as finance and audit.
- Although even here the evidence is much weaker than it should be
- The internal coding of HR records by occupation (the source of the information on this subject) is poor, with many errors and omissions
- The data in Figures 4g and 4h is therefore suggestive only -- but it likely points in the right general direction.

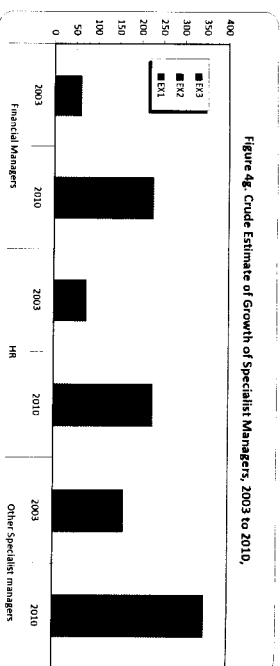


Figure 4g. Crude Estimate of Growth of Specialist Managers, 2003 to 2010.

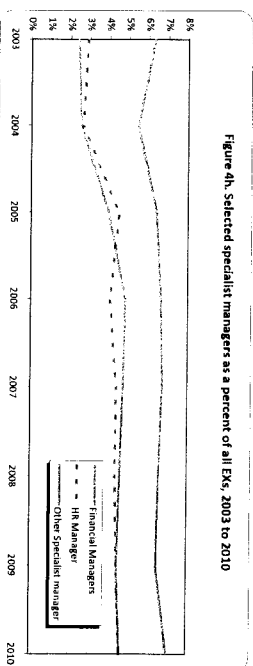


Figure 4h. Selected specialist managers as a percent of all EXs, 2003 to 2010

- Figure 4g shows the large growth from 2003 in the numbers of specialist managers at the EX-01, 02 and 03 level, including in the areas of finance, human resources and other specialties such as systems, evaluation and information. (The absolute numbers are almost certainly understated because of errors such as fields where data are missing, but the upward trend is likely real)
- Figure 4h shows the numbers expressed as a percent of all EXs. Here we see that the main growth has been in the period from 2004 to 2006
- In principle, all EX-04s and EX-05s as well as most EX-03s should be coded as senior managers, not specialist managers, meaning that they do not include positions such as chief audit officer, or top financial or HR executives. However, mis-coding proved to be quite enlightening even here. In the mid 2000s some 10 to 15 EXs were coded to the senior financial group (which is meant to apply to the private sector only). This number has doubled and tripled in the past few years!

CONCLUSION

A reason why the executive group has grown faster than overall employment growth may be attributable to the increasing complexity of the work, or increased expectations for accountability.

EX growth is in line with the growth of the expenditures for which EXs are responsible.

Figure 5a. Percent growth in EXs, 2006 to 2011 (departments with the largest overall growth)

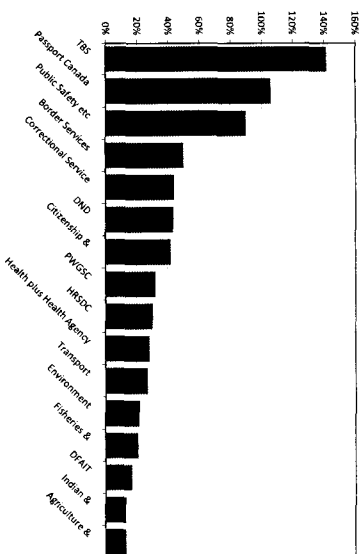
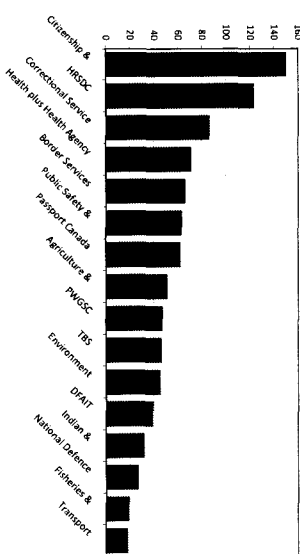


Figure 5b. Changes in total number of EXs from 2006 to 2011, departments with largest changes



5. Do the trends reflect changing government priorities?

A reasonable hypothesis would be that much growth can be accounted for by response to specific new government priorities, going beyond the more general changes described in the last section such as greater emphasis on accountability. There is some evidence that suggests this has happened, but the data must be treated with great caution for reasons given below

- **Figure 5a** shows the departments with the greatest overall increase in numbers of EXs over the past five years. When expressed in terms of percentage increases, we see a clear link with government priorities: Public Safety, Correctional Services, DND, etc.
 - Public Safety, Correctional Services, DND are near the top of the list. TBS is there as well, but more related to the accountability priorities discussed in the preceding section. (The TBS numbers may be distorted by the records which show several independent boards and commissions being coded to Treasury Board).
- **Figure 5b** shows the growth for the same departments expressed in absolute terms -- and it is the absolute numbers that drive the overall change. Here the conclusion is not so clear.
 - Large increases exist in many larger departments where the typical pattern is one increased priorities in only some of the programs of the department, allowing room for reallocation of EXs, not necessarily net new growth. In some cases, such as industry, this reallocation takes place at the time of the new initiative. In other cases, it is deferred to more periodic program or expenditure reviews-- making it difficult to draw solid conclusions from this type of data.
- **Figure 4c** in the last section adds another consideration. In many cases, we might expect to see a correlation between government priorities and the total number of employees in the department not necessarily in the number of EXs. However, there has been no direct link at the departmental level between the EX growth and overall employee growth. Indeed, as Figure 4c points out, EX growth does not move consistency with overall employment growth (as this is captured by changes in the average numbers of employees reporting to an EX).
- Further, simply showing that current growth is linked to current priorities does not suggest there is a necessary link with the overall growth of the executive group. Government priorities are always shifting and EX and employee growth is always shifting in response to these new pressures. In order to demonstrate a link with overall growth, it would be necessary to demonstrate that today's priorities are more EX-intensive than those of the earlier periods with which comparisons are being made. Informal discussions with officials in COSO represented departments were discouraging about the feasibility of coming up with definitive analysis in this area.
- As well there are caveats about the use of departmental totals to show trends in the many areas affected by organizational change.
 - Growth and decline may, in part, reflect the mobility of organizational units across departmental boundaries with no real underlying change. As discussed in the note below, some simple adjustments have been made to reduce obvious discontinuities in the departmental data shown here -- but many remain.
 - Further, those organizations that are stable are not fully representative of the whole CPA.
- Finally, it is important to recognize that all recruitment should not be directed to new priorities. There needs to be a department-specific balance between recruitment to meet new priorities and recruitment to replace retirees in areas of ongoing work. This is discussed further in Section 8 on the effects of turnover.

CONCLUSION

Much EX growth has taken place in departments doing high priority work. There may well be a link between responding to these new priorities and the net growth of the executive group in the CPA taken as a whole. However, there is no direct evidence about the extend of this. It is likely a small effect when compared with the ongoing changes in the nature of EX work discussed in Section 4.

SOME IMPORTANT ADJUSTMENTS MADE TO THE DEPARTMENTAL DATA

- A number of adjustments were made in order to get closer to apples-to-apples comparisons. These were not made in the analysis of the total CPA data in the rest of this note.
- Departments and agencies with a significant number of non-EXs in the EX salary range were excluded (often lawyers or physicians acting in executive positions). Justice, Veterans Affairs, the office of the Director of Public Prosecutions, the Immigration and Refugee Board and a number of similar boards and tribunals were excluded. The RCMP civilian staff were excluded.
- In comparisons over time, certain major and simple organizational re-groupings were made -- (HSOC and Social Development), (MRC and Health Research), (TBS and the Public Service HR Agency), (Statistics Canada and survey operations), (Archives and Library).
- Only departments with employees in both years were included.
- As in the other charts, Border Services and CRA are excluded from the CPA totals.
- Unless otherwise specified, a larger department for the purposes of this report, is one that had 500 or more employees in 2010.

6. Recent EX growth has been entirely concentrated in designated groups

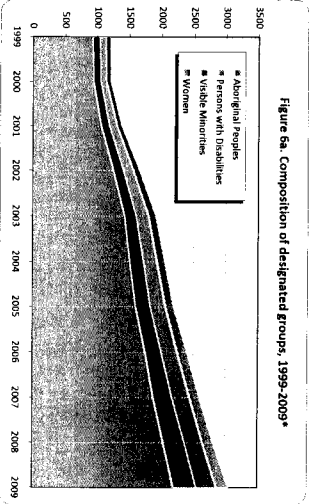


Figure 6b. Relative growth of EXs in designated groups, 1999-100*

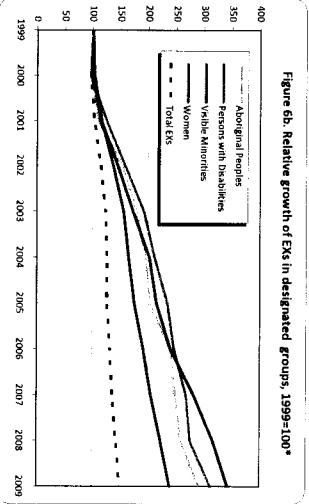
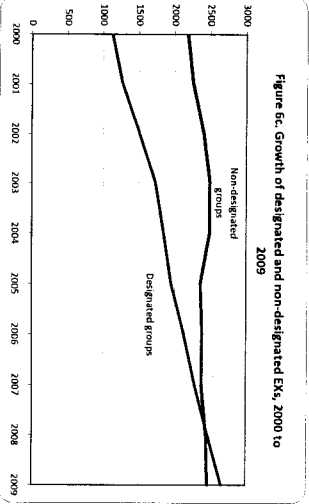
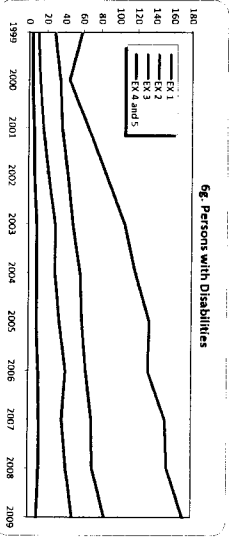
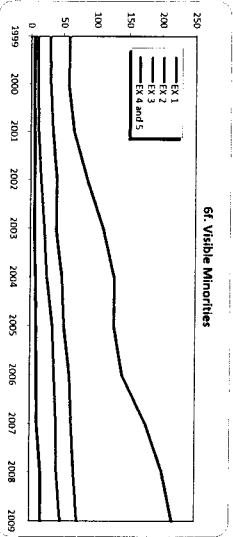
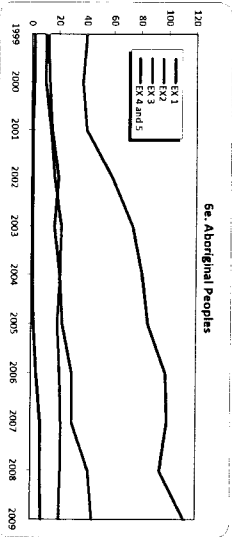
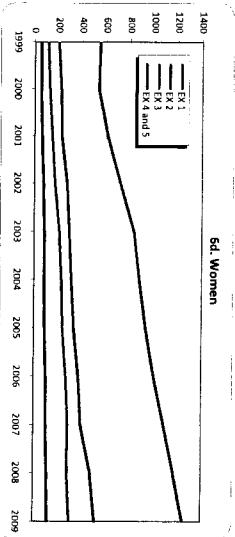


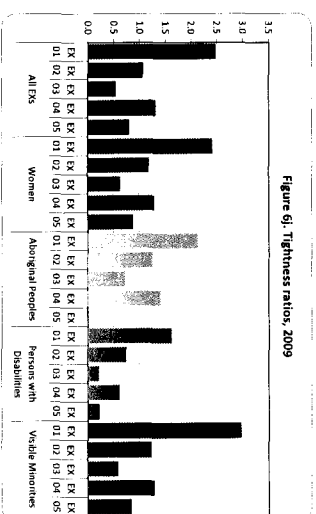
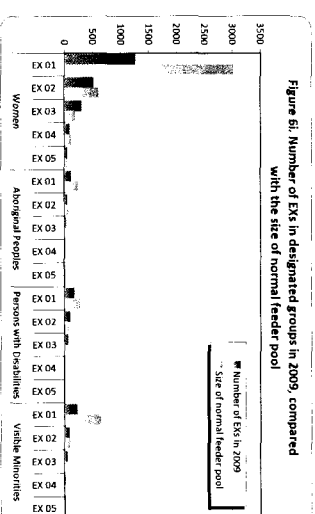
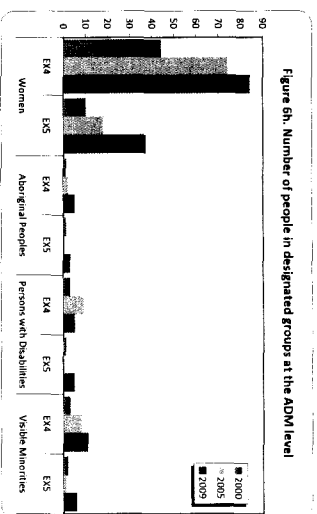
Figure 6c. Growth of designated and non-designated EXs, 2000 to 2009



- There has been significant success in increasing the representation of designated groups in the EX population.
 - Figure 6a shows that, since 1999 the largest growth in absolute numbers has been among women, obviously so since this is much the largest designated group
 - Figure 6b examines relative growth by using index numbers, where the number of employees in 1999 is set to equal 100
 - By 2009, the overall number of EXs had reached about 150, a growth of 50%
 - Among the designated groups, the growth was least among women, but still reached 240 points, a growth of nearly 2 ½ times
 - The largest increase was among Visible Minorities, a growth of 3 ½ times over this 10 year period
 - Figure 6b also shows that the number of EXs who were not members of designated groups also grew, but by a much smaller amount
 - Figure 6c examines the overall growth of designated groups versus EXs in non-designated groups.
 - Trends in non-designated groups have remained flat over the past decade, with nearly all the growth in the designated groups
 - The charts on the right show growth by EX levels. Not surprisingly, the growth was highest at the EX1 level and more modest at the higher levels – as one might expect given the composition of the feeder pools for these higher levels.
- Pressure in feeder pools?**
- The growth in EXs over the past decade has been among the designated groups. Has achieving this success resulted in some upward pressures on overall EX growth?
 - Meeting equity goals might be an upward growth pressure if there were a serious shortage of people in designated groups in the feeder pools from which EXs are generally drawn.
 - If that were the case, there might be pressures to take special measures such as creating positions that might be especially suited to people in designated groups, but that otherwise would not be justified.
 - The next page therefore examines the feeder pools



6 continued. Recent EX growth has been entirely concentrated in designated groups



- In this analysis of feeder pools, we will examine EX-04s and 05s separately, instead of combining them as in most other charts. **Figure 6h** shows that:
 - The growth of women at the ADM level, particularly among EX-04s, has been quite dramatic. Between 1999 and 2009, the number of female EX-04s doubled, and moved up from 27% of the group to 41%.
 - Progress on other fronts has been more limited, as representation in the normal feeder groups is low.

- **Figure 6i** examines the size of the 'normal feeder' groups from which people are typically recruited. We have arbitrarily defined the feeder group for a level as being the number of people in the immediate level below five years ago, but counting only those in that group who had more than 5 years before retirement eligibility. For example, the figure shows that there were 1255 female EX1s in 2009, compared with 3008 women in EX minus 1 jobs in 2005 who had at least 5 years before retirement.
 - That is, in this example, there are 2.4 times more people in the feeder group, what we refer to as the '**pool tightness**' ratio.
 - The figure makes it clear that it is only at the EX-01 level, and even then only for women and visible minorities, that the size of the normal recruitment pool is relatively large.

- **Figure 6j** examines these tightness ratios for all EXs and for EXs in designated groups. We can arbitrarily use a ratio of 1.0 as marking considerable tightness in the supply of potential candidates. A ratio of 1.0 says that the current size of the EX group in question is the same size as the group that normally provided replacements. For ratios below 1.0, we should anticipate significant difficulties in finding qualified candidates, particularly during periods when there is high turnover.
 - The tightness ratios for women mirror those for all EXs, slightly better in some cases. That is, no special recruitment pressures appear to exist here, although it is interesting that the ratios are below 1.0 for all EX-03s and EX-05s, regardless of gender.
 - For other designated groups, it is important to recognise that very few people are involved and conclusions are hard to draw. However, generally speaking, there are reasonably healthy replacement pools at the EX-01 level, but tightness at most other levels -- particularly so for people with disabilities, and a little less so for visible minorities.

CONCLUSION: There are pressures that might result in special measures to attract aboriginal people, people with disabilities and visible minorities, particularly at more senior levels. However the numbers are too small to have had any significant impact on the size or growth of the whole executive group.

More generally, the concentration of all EX growth among designated groups should be treated as a major accomplishment. Equity considerations do not account for recent ex growth, but that growth has provided an opportunity to make major gains on the equity front.

* Employment equity information is for the Core Public Administration only (FAA, schedules I and IV). It includes terms of three months or more, and seasonal employees. It excludes employees on leave without pay. More recent data will be available after employment equity reports are tabled in Parliament.

7. Have changing demographic and linguistic factors played a role?

Figure 7a. Percent of EXs, by official language, 2000 to 2011

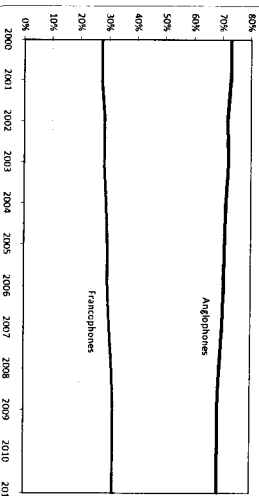


Figure 7b. Percent of EXs who are Francophone, by level, 2000 to 2011

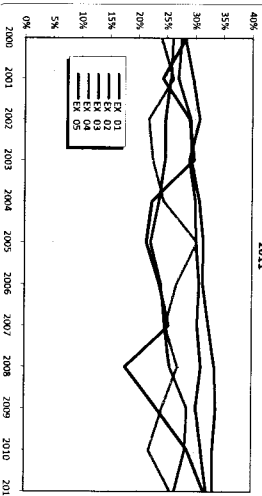
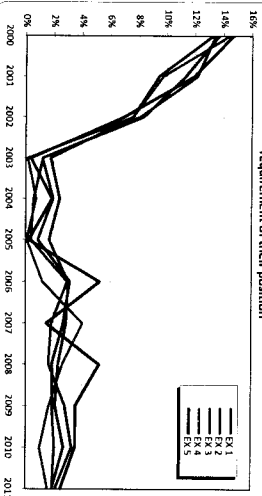


Figure 7c. Percent of EXs who did not meet the language requirement of their position



Official languages

- Figure 7a points to a picture of reasonable stability. See also Annex B for census data on language
- Figure 7b shows that this stability also applies to all EX levels. There has been little recent change in the percent of francophones at different EX levels. (There has been even less change in other occupational groups)

Bilingual requirements

- Figure 7c shows that almost all EXs, at all levels, meet the language requirements of their position
 - The data show an adjustment at the beginning of the period where some 15% did not meet newly toughened up language requirements
 - A number of those who did not meet were exempt from language training, but there is also data (not shown here) for those who had to go on language training. This latter number was at a peak in 2003 to 2005, creating pressures on acting appointments as discussed in Section 11
- Figure 7d shows the men still outnumber women at all EX levels, but only slightly.
- Figure 7e mirrors the designated group chart for women on Slide 5, but this time cast in terms of the falling percentage of men at all EX levels. (Note that we have exaggerated the extent of decline by starting the graph at 50%, not zero, in order to more clearly show the patterns among EX levels.)

Average ages

- Figure 7f shows that average ages increase a little at each EX level, as one would expect given that most staff are recruited internally, usually from a pool of candidates one level lower.
 - Figure 7g shows that trends in average ages have been quite stable in recent years, at all EX levels
- Average age data by itself does not tell an interesting story.
- On the other hand, the census data shown in Annex B allows some more illuminating comparisons with other sectors. The federal public sector (broadly defined) has a relatively large number of senior managers aged 45 to 54, and relatively fewer that are over age 55 (and slightly fewer that are under the age of 45)
 - Also of potential interest are trends in the age of retirement of pension eligibility -- topics addressed on the next page

Figure 7d. Number of men and women, by EX level, 2011

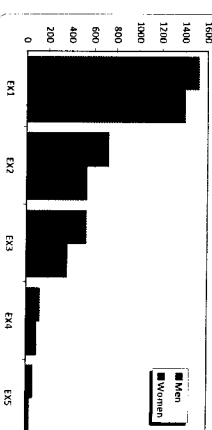


Figure 7e. Percentage of men, by EX level, 2000 to 2011

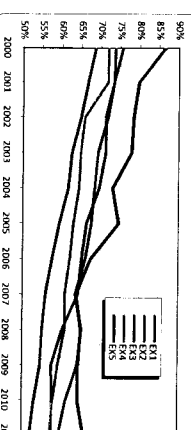


Figure 7f. Average age by EX level, 2011

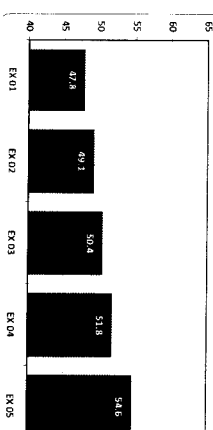
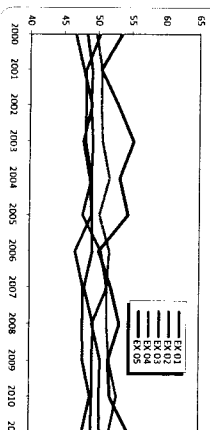


Figure 7g. Average age by EX level, 2000 to 2011



7 continued. Have changing demographic and linguistic factors played a role?

Figure 7h1. Average age of retirement, EX1s and EX2s

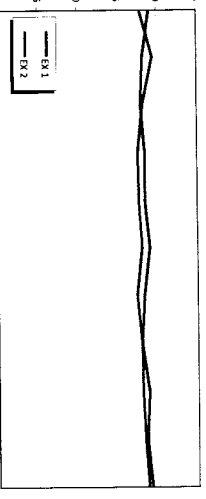


Figure 7h2. Average age of retirement, EX3s, EX4s and EX5s

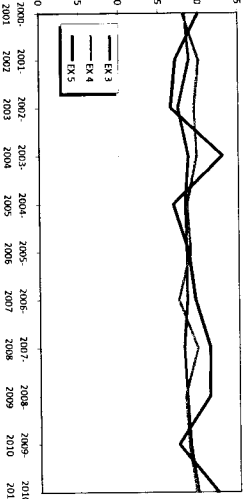
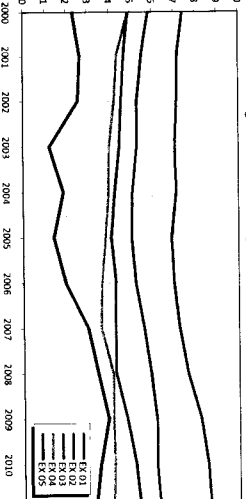


Figure 7i. Years until eligible for unreduced pension*



Retirement age

- Figures 7h(1 and 2) and 7i examine recent patterns in the actual ages at which EXs retire
- There has been little change in recent years, and little difference across levels, with average retirement ages being just a little under age 60 -- with a little more variability among EX-05s, mainly reflecting the small size of that group.

Years to until eligible for a pension

- Figure 7i shows recent trends in the average number of years until EXs at different levels are eligible to retire
- It shows, naturally, that higher level EXs are nearer to retirement eligibility than their somewhat younger colleagues at lower levels
- There has been a slight increase in years until eligible since the mid 2000s

Pension eligibility on actual retirement

Figure 7j shows the eligibility status of EXs when they actually retire

- The largest group are those who retire when they are eligible to receive a pension without a penalty (but not with a full pension)
- The next largest group are those with a full pension. A full pension is defined as 35 years of pensionable service or age 65 with 2+ years of pensionable service.
- The smallest number retire early, before pension eligibility
- Figure 7k shows the same data as a percent of the total. There has been an increase in the percentage of those who stay on beyond the age of eligibility for an unreduced pension. That is they receive a full pension, not one that has been actuarially reduced.

CONCLUSION

Language, age and pension eligibility has shown little change in recent years and have likely played no significant role in shaping the size and growth of the overall executive group.

The larger changes in gender composition have already been noted under heading of employment equity.

Figure 7j. Pension eligibility on actual retirement**

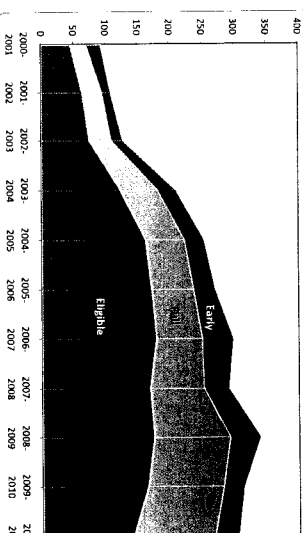
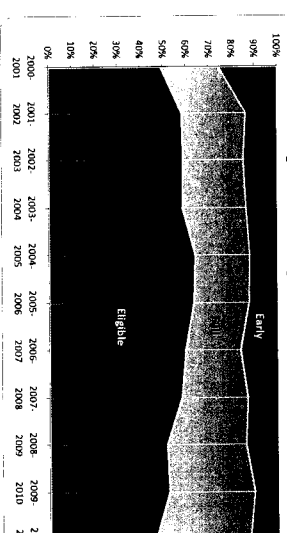


Figure 7k. Pension eligibility on actual retirement

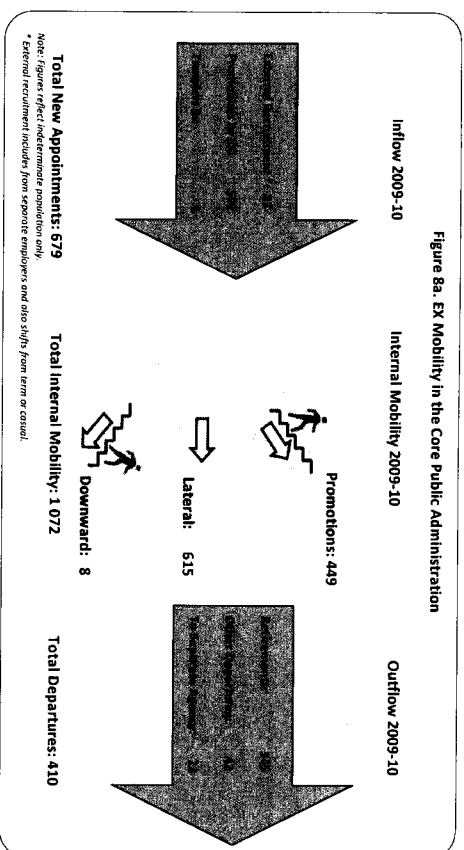


* Figure 7i is based on substantive classification. EX-05 includes GK. Includes active and on leave without pay. Those past eligibility were assigned a negative number; there are many cases where people remain years after becoming eligible. Those without a valid pensionable service date were excluded, as were those subject to special retirement criteria at the Department of Corrections.

** Figures 7j and 7k excludes without a valid pensionable service date were excluded, as were those retiring from the Department of Corrections due to the difficulty in determining their eligibility. 'Full Pension' is defined as 35 years of pensionable service or age 65 with 2+ years of pensionable service. 'Eligible' and 'Full' are mutually exclusive categories. EX-05 includes GK.

8. Have changes in turnover rates affected EX growth patterns?

Figure 8a. EX Mobility in the Core Public Administration



Notes on Figure 8a
 Lateral and downward transfers are combined since there are few downwards. In 2009-10 there were 615 lateral transfers and 8 downward transfers within the EX group. There were also 5 downward transfers from EX to other groups in that year.
 Other departures are mainly resignations

Figure 8e. Consequence of high turnover

Time spent in a position. EXs at all levels tend to average about 3 years in their position. Trends since the mid 2000s (not shown) show reasonable stability in the duration of time in a position at the EX4 and 5 levels. At other levels, there have been declines, often of half a year or more, especially among EX1s and EX2s. Since most recruitment is internal, this decline is the expected consequence of the overall growth in the numbers of EXs at all levels during this period, especially at the EX3 level.

Note, however, that the projections in Section 3 suggest that, even in the absence of changes in hiring patterns, length of time at any one EX level is expected to increase somewhat in the future

Classification and staffing volumes. A case study of COSO represented departments in 2010, together with PSC staffing data, found high levels of staffing actions with one staffing actions for each 2 EXs in 2008/9 and also high levels of classification actions, especially at the EX1 level. However, this is the expected consequence of an increased number of EXs, particularly in new areas that respond to new priorities.

Figure 8a gives a current snapshot of entries to, and departures from, the EX cadre of the CPA -- as well as internal mobility. We might expect that changes in recruitment, promotions, or departures as shown in the chart might have an effect on growth patterns -- at least temporarily. For example, if there were a glut of departures in a concentrated period of time, we might expect to see negative growth for a while -- until the system got caught up, followed by a cyclical wave in new appointments.

Figure 8b shows trends in arrivals over the past decade, mainly through internal promotions from the level below the EX group and targeted external recruitment programs. The new intake was strongest in the period 2005 to 2009 -- compensating for high levels of retirements (compared with earlier periods) as well as meeting new priorities.

Figure 8c shows internal mobility within the EX cadre. Changes are large and have shown recent growth, but not as dramatic as in the case of new appointments. Perhaps a little surprising is the large number of lateral moves at the same EX level. Recently there have been more transfers than promotions.

Figure 8d shows that departures were stable over the period, with a great majority being retirements. In other words, the pattern of growth in appointments seen in Figure 8b may reflect new work, not replicating retirees. Nevertheless, retirement rates are high by historic standards and the figures for the latest decade still reflect the consequences of the large number of early departures that took place as a consequence of program review in the 90s.

Figure 8e explores consequences on time spent in position and staffing and classification volumes

More generally, turnover is high, but not unexpectedly is lower than in many feeder groups.

CONCLUSION

Turnover is high and has some negative consequences. However the churn may be the consequence of EX growth, not its cause. A full examination would need look at turnover in both the EX groups and in feeder populations -- both integral parts of the same internal labour market.

Figure 8b. Recent trends in appointments to the EX cadre



Figure 8c. Movements within the EX cadre

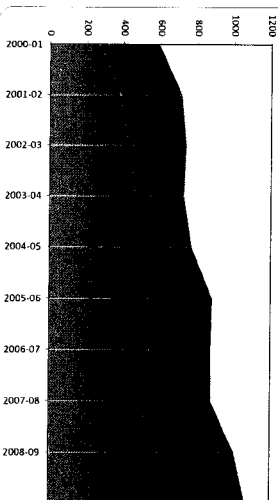
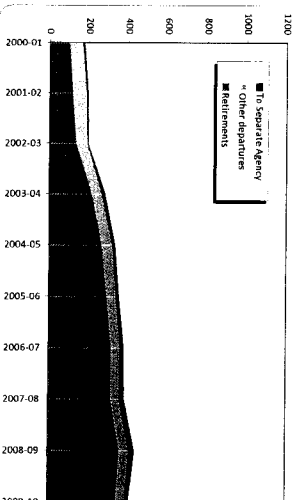


Figure 8d. Departures from EX cadre



9. Have there been changes in EX spans of control that have made a difference?

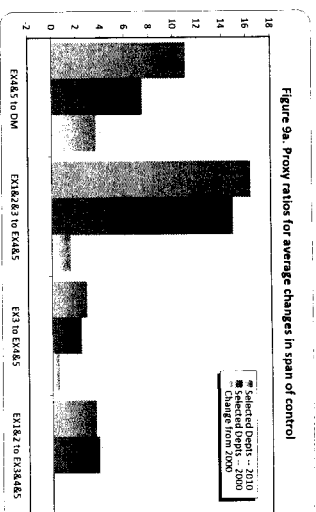


Figure 9b. How span of control could matter

- When dealing with an entire organization, a broad span of control (i.e., the average number of people reporting to each supervisor or manager) has a large effect on the size of the whole management cadre and reduces management layers.
- However, different spans of control within the EX category, may have smaller consequences for the overall size than might be expected -- but nevertheless it will have important consequences for the numbers of layers in the management hierarchy.
- For example, take two departments with the same number of front line workers and supervisors (1300 in our example)
 - In a flat EX variation, the DM has 6 ADMs, each ADM averages 6 DGs, each DG averages 6 Directors, etc.
 - In a vertical EX variation, direct reports at all levels are exactly the same except that ADMs average only 3 DGs and the DGs have only 2 directors.
- In this example, the flat organization will have one less management layer than the vertical variation, a potentially major gain in flexibility and reduction of internally-generated paper.
- The vertical organization will also require slightly more management employees than the flat structure, but only by about 1% -- taking all levels of management into account, not only EXs.

- Span of control (numbers of managers reporting directly to an EX) can affect the overall size of the EX cadre and, possibly, how it has changed over time.
 - In principle, span can be measured directly by examining direct reports on organization charts or position descriptions. However, our records do not easily allow us to do this consistently over time.
 - The ratio of the relative sizes of different EX levels can give a (rough) proxy for net changes in span of control over time.

- Figure 9a shows four selected proxy ratios:

- **EX-04 and 05 to deputies.** This shows that, in the selected departments, a median number of 10 ADMs reported to the head (or heads) of the department, up by 3 from the median of 7 in 2000
- **DGs and ADMs.** Moving to the ADM level (total of EX-04s and EX-05s), we see that the median number of EX-03s reporting to them was 2.9, up slightly by 0.7 in 2000. This is a rough proxy for the number of DGs per ADM
- **Another ADM ratio.** The ratio above may be misleading since not all DGs are at the EX-03 level. Accordingly, the next ratio looks at the sum of all EX-01s, EX-02s and 03s in relation to the number of ADMs. Here, we see that the median EXs in total that come under ADMs is 15.7, down slightly (-1.0) from 2000.
- **Senior management to middle EX management.** The final ratio looks at the normal definition of EXs who would be counted as senior management (EX-3s, 4s and 5s) and finds that the median number of EX-01s and 02s who report to that senior group (taken collectively) is 3.8, the same number as in 2000.

- The figures on the next page provide data for selected larger departments

- Overall, and focusing on the span of control of ADMs and DGs, there have not been large changes in recent years. (A longer look at unadjusted ratios back to 1983 does not show much change in the EX ratios over a longer period of time, apart from a fall in the total number of EXs reporting to ADMs in the 1990s and a subsequent increase in that ratio to a higher level than it was in the 80s.)

CAVEAT

- The proxies used in these charts provide a rough measure only since
 - Actual reporting arrangements come in different configurations within and across departments.
 - In some cases, non-EXs report to EXs
 - Associate positions can skew the calculations
- **Figure 9g** on the next page shows how the data were adjusted to reflect some of these problems
- Further, at the EX level, the main span of control issues relate primarily to the number of EXs reporting to ADM and DG levels, and changes here might not have as big an overall effect as might be thought, as described in **Figure 9b**

CONCLUSION

- The numbers are very rough, but suggest that
 - deputies have a wide span of control, while ADMs and DGs have narrow spans -- confirming the obvious
 - changes since 2000 have not been large and are likely to have little impact on overall EX growth.

9 continued. Have there been changes in EX spans of control that have made a difference?

Figure 9c. Average Number of ADMs per Deputy Minister

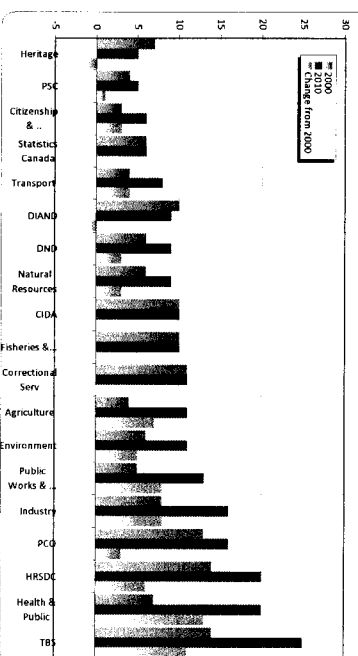


Figure 9d. Number of Directors General (EX3) compared with the number of ADMs (EX4 and 5)

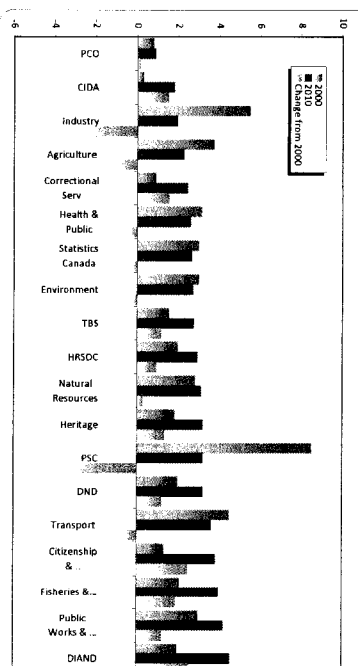


Figure 9e. Number EX3s and 2s compared with all senior managers (EX3, 4 and 5)

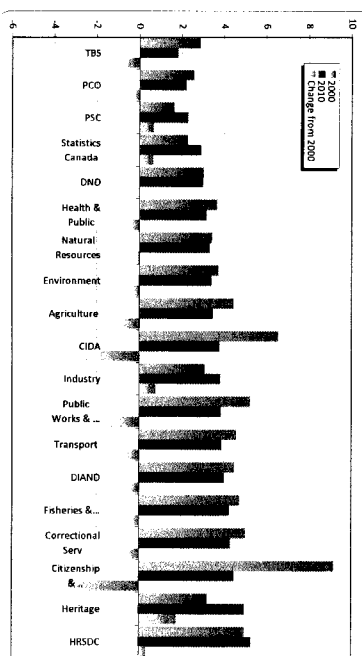


Figure 9f. Number of EXs who are not ADMs (EX1, 2 and 3) compared with the number of ADMs (EX4 and 5)

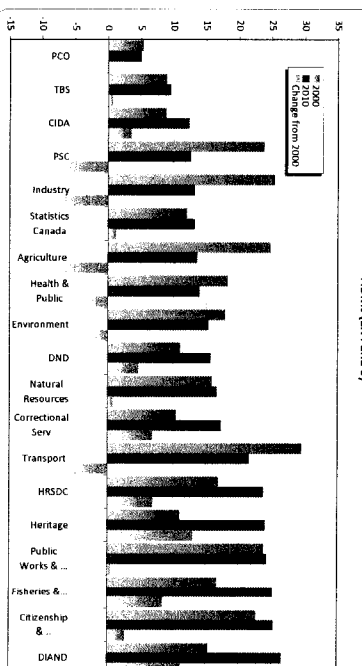


Figure 9g. How the proxy ratios were calculated

- In calculating the EX ratios in this section, an attempt was made to reduce distorting influences by:
- Dropping smaller departments and agencies whose reporting structure is quite different from that in larger departments – and where non-EXs play a larger role in the management structure. Only those with 50 or more EXs in 2010 were chosen.
 - DFAIT and Finance were excluded because they have unique arrangements (diplomatic staff in the case of DFAIT) as were departments and agencies where non-EX groups perform a significant number of senior management functions (e.g., Justice).
 - Health Canada and the Public Health Agency were combined. In order to make comparisons between 2000 and 2010 but, in 2010, the ADM to DM ratio was adjusted to reflect the fact that there are two departments.
 - A similar adjustment was arbitrarily made in the case of HRSDC where it was assumed that ADMs reported to two different deputy heads (taking account of Service Canada).
 - In all other cases, it was assumed there was only one DM per department.
 - No adjustments were made for associates. As shown in Section 12, the number of associates appears to be small, is scattered across different levels, and there appears to have been no large system-wide change in numbers over recent years.
 - Medians were used rather than mean averages, to minimize the effects of outliers.

10. Does the concentration of EX growth in the National Capital Region affect overall growth?

Figure 10a. Total EXs located in, and not in, the National Capital Region (NCR)

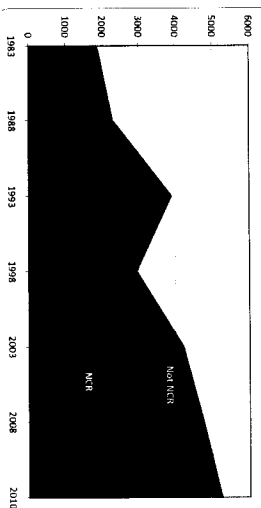
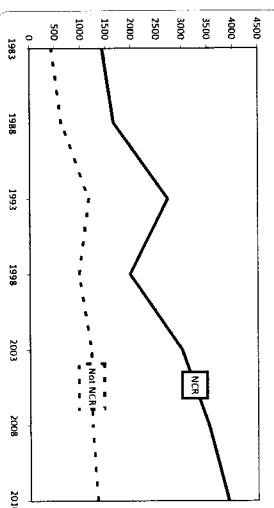


Figure 10b. Total number of EXs*



*All the data on this page is for the Core Public Administration, excluding Canada Revenue Agency and Border Services (and the predecessor organizations for CRA) in order to capture real trends. As well, an adjustment has been made to include relevant SAs prior to 1993. The data reflect the active populations, all figures (including adjusted) as of March 31st of any given fiscal year. The data are shown for 1983 to 2010.

- Figure 10a shows the regional make-up of the executive group
 - The blue area at the bottom shows trends in EXs in the National Capital Region (NCR)
 - The burgundy area shows EXs located outside the NCR

- Figure 10b, which shows the trends separately, makes it clear that most of the recent growth has been in the NCR. Trends outside the NCR have been stable for many years

- As well, EXs in the NCR were much more affected by program review in the 90s

- The charts to the right show comparative stability in the regions for each of the EX levels
 - In particular, the strong growth since the mid 90s among EX-01s and EX-03s in the NCR has not been mirrored in the regional figures

- It is not surprising that growth has been strongest in the NCR. That is where many of the new accountability functions are located. Many new initiatives are developed from Ottawa. And many of the knowledge workers referred to in Section 2 are located in Ottawa, as can be seen in Figure 10g below.

- Regional effects will likely be largest in certain labour markets, such as cities where EX pay falls considerably below that of private sector counterparts -- making it difficult to recruit and retain staff and putting upward pressure on pay and classification systems. However, these effects are not large enough to have significantly affected trends in the CPA as a whole.

- There are other factors such as the size of the organization being linked to the nature of its mandate (i.e. program service delivery mandate vs. central agency overarching policy mandate).

CONCLUSION

There is no reason to think that the concentration of EXs in the NCR has had any large effect on the overall growth of the EX group. Indeed, because larger organizations require a slightly smaller proportion of EXs, a centralized NCR-based structure might have fewer EXs than a decentralized one. However, these effects, if they exist, would be small.

Figure 10g. Size of the largest knowledge occupations in CPA, NCR and regions (excluding AS and PM), 2011

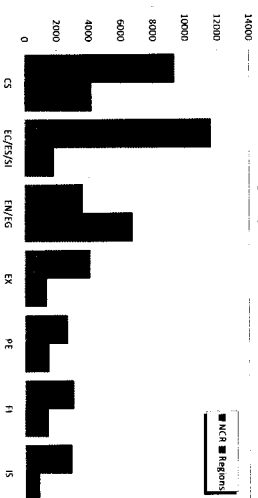


Figure 10c. Number of EX1s*

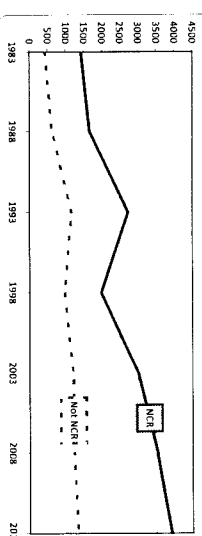


Figure 10d. Number of EX2s*

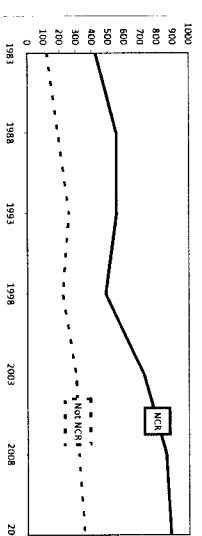


Figure 10e. Number of EX3s*

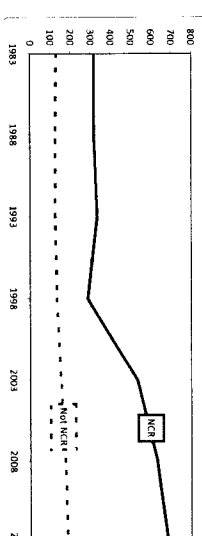
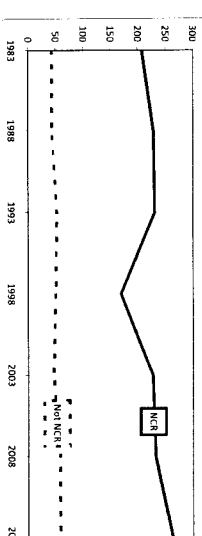


Figure 10f. Number of EX4s and EX5s*



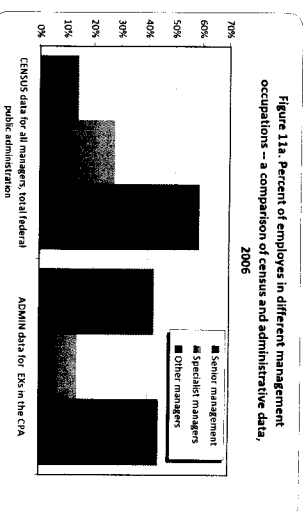


Figure 11a. Percent of employees in different management occupations -- a comparison of census and administrative data, 2006

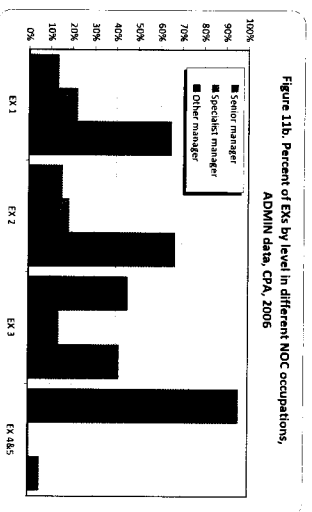


Figure 11b. Percent of EXs by level in different NOC occupations, ADMIN data, CPA, 2006

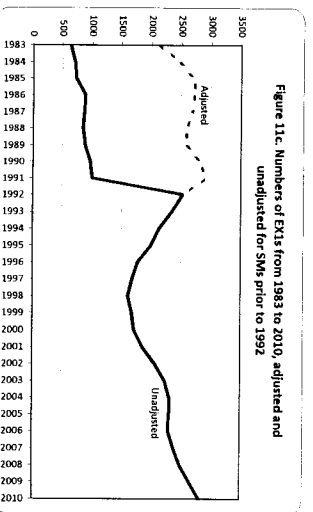


Figure 11c. Numbers of EX1s from 1983 to 2010, adjusted and unadjusted for SMs prior to 1992

11. The way in which the EX group is defined makes a big difference

- Many EX-01 and EX-02s would not be categorised as senior managers in standard classification systems. For example, the National Occupational Classification (NOC), which is used in surveys and censuses, has the following structure:
 - **Senior Managers** -- which covers deputies, ADMs, DGS, executive directors, etc
 - **Specialist Managers** -- which covers people who head up groups that provide HR, finance, audit, communications and professional services (such as those provided by economists, lawyers or scientists)
 - **Other Managers** -- which covers line managers in the middle ranks such as chiefs and directors, plus miscellaneous management categories
- **Figure 11d, 11e and 11f** on the next page use 2006 census data to make comparisons across sectors using this 'normal' basis of comparison across occupations
- **Figure 11a** on this page compares
 - The NOC management classifications for CPA EXs cadre as they were coded internally in March 2006
 - The 2006 census data for managers in the federal public administration
- Both sets of data have quality issues
 - The census data are likely more realistic, on balance. Occupational coding is not simple and the census pays far more attention to quality and consistency
 - As well, the comparison is not for the same universe, with the census data covering all the federal sector, not just the CPA. The census data also includes middle managers below the EX level
- Taking all these caveats into account, we can conclude that:
 - The EX cadre is neither representative of all management, nor of senior management -- when one takes the ordinary meaning of these terms. The census provides a better picture of the size of both these groups.
 - That is, the EX cadre contains an unusual mix of positions: it includes most senior managers and some, but not all, middle managers and specialist managers
- **Figure 11b** shows the admin data by EX level. As noted, our occupational coding is poor and the data likely exaggerates the number of senior managers at the EX1 and EX2 levels, and understates the number of specialist managers, likely at all levels
- **Figure 11c** illustrates a major event that resulted in many specialists and middle managers joining the EX cadre within the CPA -- the inclusion of the SM category into the EX occupational group in 1992 -- mainly as EX1s. The dotted line shows the total of EX1s and SMs for the earlier period. As noted earlier, most but not all SMs were converted to EX-01s. However, in order to provide some measure of consistency, the historical data treat all SMs as if they had been EX-01s in the period before 1992, thereby exaggerating the extent of the decrease in EXs in the early 90s.

CONCLUSION

- The definition of the ex category makes a **big difference** in growth comparisons, if one is using the ex category as a proxy for examining trends in the number of senior public service managers
- as shown in earlier sections, most of the pattern of ex growth has been driven by changes at the EX-01 and EX-02 levels -- levels that are not typically considered as senior management.
 - senior management growth, defined in the normal manner, has been much more moderate and has shown much less cyclicality
 - nor does executive data have anything meaningful to say about middle management trends, since that category normally also includes people in positions below the executive level
 - none of this would be a problem if our human resources records were of reasonable quality and included proper occupational coding. We would then not have to rely on a pay classification system as a poor proxy for occupational analysis

11 continued. The way in which the EX group is defined makes a big difference

Using the census to make consistent comparisons

- Given the way in which the EX group is defined, the best way of making consistent comparisons across sectors is to use the (admittedly very rough) Census data, which asks the same information of everyone, using the same definitions.
- The charts on the next page compare industries that are somewhat similar to parts of government
- The comparisons are interesting, but of course being for a single year only, say nothing about comparative trends. The 2011 census data will make such comparisons possible, however, when it becomes available in about a year's time
- Figure 11d shows that **all managers** account for about 12% of federal employees, a little higher than the figure for provincial and local governments -- but generally in the middle of the road when compared with a range of private sector and semi-public industries
- The percentage of **senior managers** at the federal level is about average, but smaller than in other orders of government (for example municipal clerks and councillors even in smaller locations are treated as senior managers)
- Figure 11e compares the distribution of managers by type of manager. Nothing appears surprising when the nature of the industries is taken into account.
- The biggest difference is with other orders of government who have far fewer middle managers, relative to senior managers -- reflecting their (often much) smaller size. A small organization will often need almost as many people at the top as a larger one.
- Figure 11f examines the distribution of specialist managers.
- Admin managers (HR, finance, etc) dominate at the federal level, as in many other industries.
- Managers of professional shops are the next largest.
- The distribution seems to be in line with the nature of the work in the various industries

Figure 11d. Managers and Senior Managers as a percent of all employees, 2006 census

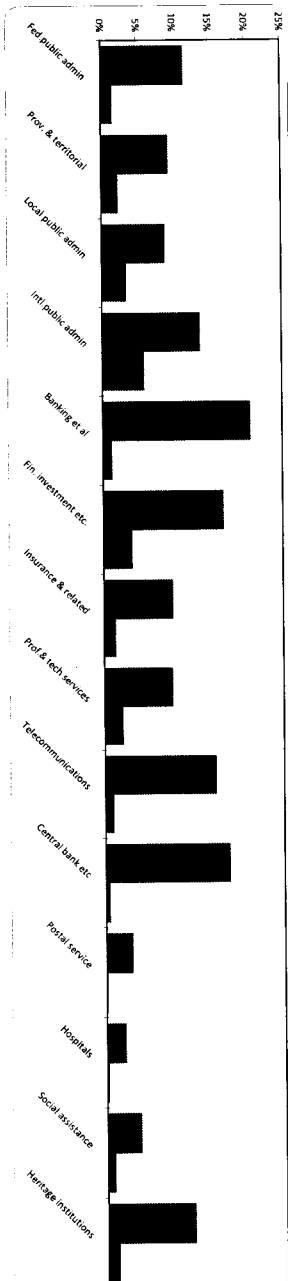


Figure 11e. Percent distribution of managers by type

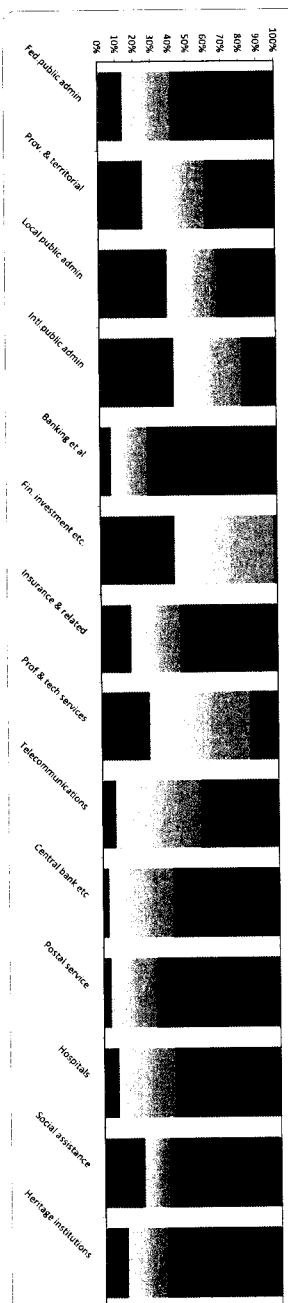
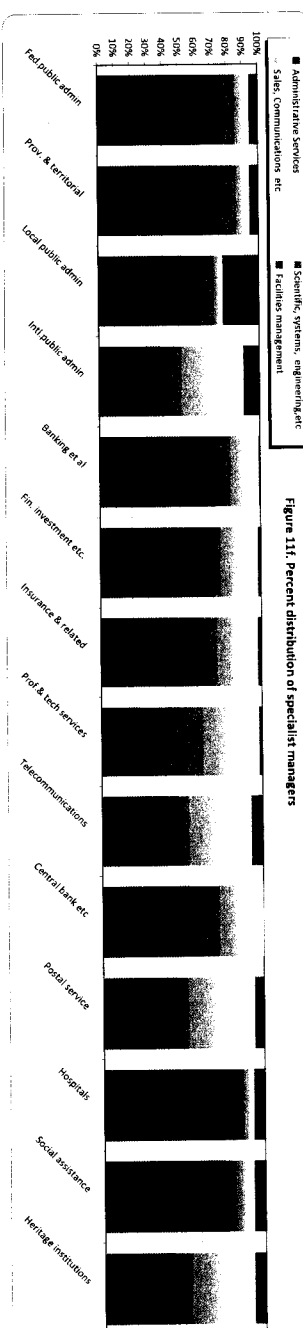


Figure 11f. Percent distribution of specialist managers



12. False starts: other factors did not have a big effect on EX growth

Figure 12a. Number of acting appointments, by EX level, 2000 - 2011

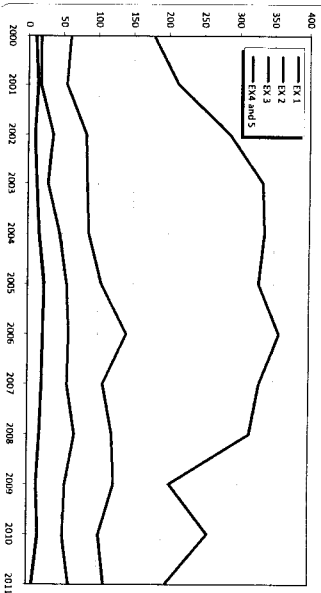


Figure 12b. EXs in the CPA with and without acting appointments, 2000 - 2011

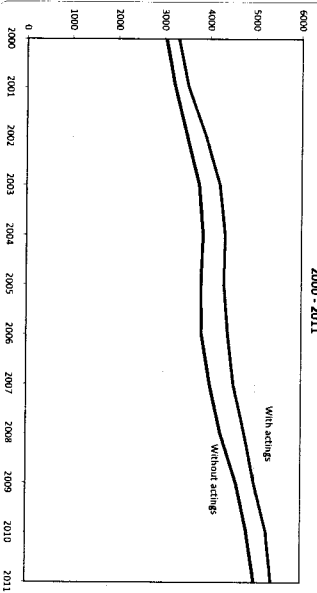


Figure 12c. TENURE

- Nearly all EXs are indeterminate (98%)
- For many years about 0.5% of EXs have been terms
- Casual EXs grew sharply in recent years from zero in 2001 to 54 in 2010
 - Many are '90 day' retirees working at all EX levels
 - However, they account for only 1% of EXs in 2010, and have had only a marginal effect on overall EX growth

This section briefly discusses a range of factors that, at one time or another, have been suspected of influencing EX growth -- but that, on closer examination, have not played a large, independent role, at least at the level of the CPA as a whole. These include:

- The role of acting appointments
- The role of casuals
- The word 'associate' in the title of executive positions (sharing a position)
- Double banking
- Classification creep as an independent cause of growth
- Reorganization as an independent cause of growth
- Changes in departmental size

ACTING APPOINTMENTS

Figures 12a and 12b deal with the effect of acting appointments, which are included in the main data in this presentation.

- There was a rise in acting appointments in first half of the 2000s, especially among EX-01, then a decline since then -- mirroring the pattern of language training and the need to fill in with acting appointments.
- However, numbers of acting appointments are small and have little effect on overall trends

CASUALS

Figure 12c discusses tenure, i.e. the numbers of terms, casuals, students and interdeterminates. There has been a sharp recent rise in the number of casual EXs, but the numbers are again too small to have any large effect overall on executive growth.

ASSOCIATE POSITIONS

One possible cause of growth might be an increase in the number of associate positions, where more than one person shares the leadership for a work unit. However, Figure 12d suggests that, for most departments, numbers are quite small and have not changed greatly over the years.

DOUBLE BANKING

An earlier round of the present EX study examined a number of issues in depth using a case study of COSO represented departments, especially in areas where central records were weak. That study found that using data from individual departmental records also proved challenging, but was nevertheless able to draw some conclusions. One of these was that the practice of 'double-banking' of EX positions was not a big issue. See Figure 12e.

Figure 12d. 'ASSOCIATE' IN JOB TITLE

- Central files that record associate positions are of poor quality with many unfiled fields. Only 36 EXs were found in the whole CPA with the word 'associate' in their job title, up somewhat from 26 in 2000 -- an obvious undercount as the next bullet makes clear.
- TBS data on associates at the ADM level shows 20 such positions in 2010 (which is known to be slight undercount). In recent years the number has been around 10 to 15 with a significant number being terms.
- As part of the present exercise, we examined phone books (and GDS) in 2000 and today in a few selected departments in order to find senior positions with word 'associate' in their title. We did find greater growth in associates at lower EX levels, particularly at the director level that might well have played a role in EX growth in a few departments. However no generalizations to the CPA as whole were possible.

Figure 12e. DOUBLE-BANKING

- A 2010 case study used COSO represented departments to examine a number of issues related to EX growth. One of these was double-banking, the practice where two EXs are indeterminately appointed to the same position
- That study found that in the COSO represented departments the practice was used only *infrequently* and for purposes such as
 - Knowledge transfer prior to a retirement
 - Individuals were seconded or on interchange assignments for periods exceeding the provisions of the Temporary Assignment Authorities
 - Individuals have taken long-term leave without pay to accept Governor in Council appointments.

12 continued. False starts: other factors did not have a big effect on EX growth

Figure 12f. Classification creep

There is some evidence of classification creep. For example, an examination was made of position titles that contained the word 'director' (i.e., not usually classed as a senior manager) in 2003 and in 2009

- In 2003, 55% of such positions were in the EX1 category, rising to 62% in 2009

- The remainder of the directors were mainly classified as specialist managers, such as PE6, AS7 or ES6
However, this type of change can be equally well explained by the changing nature of EX work that was discussed in Section 4. Further, any effects on span of control are captured in the discussion of this subject in Section 9.

A full examination of classification creep could not be limited to the EX group alone. It would have to include examination of other occupational groups, including PA (AS, PM). Another factor that may influence classification creep of this sort can be caused by classification systems that do not keep up with the evolving nature of the work, as well as by misuse of current systems.

It has sometimes also been suggested that the relatively lower pay of EXs when compared with the private sector encourages people to create more EXs than would otherwise be needed in order to create higher levels and higher-paid EXs positions that will help in recruiting talented staff. As well, for similar reasons, there might be a tendency to include high level professionals in the EX category in order to obtain appropriate pay levels.

• The system does benchmark EXs against the private sector.

However, at higher EX levels, it is well documented by Hay (and is also seen in the Census data in Annex B) that pay is lower inside the CPA.

• However, the evidence does not suggest that this had much effect on overall EX growth rates.

- The biggest growth in numbers of EXs recently has been at the EX2 and EX3 level, while the biggest gap between EX and private sector compensation is at the EX4 and EX5 level.

- In any event, most recruitment is internal involving people using the same compensation system. External recruitment is quite small.

CLASSIFICATION CREEP AS AN INDEPENDENT SOURCE OF GROWTH

It is possible that some positions may have been increasingly classified at levels that are higher than those indicated in classification standards with result that additional layers are added to the hierarchy or artificially reduced spans of control -- creating upward pressures on the size to the overall executive group. **Figure 12f** suggests that there may have been some classification creep, but it is unlikely to have resulted in any significant increase in the number of executives above the EX-02 level. Increases in the number of executives at the EX-01 and EX-02 levels may partially be due to classification creep.

REORGANIZATION AS AN INDEPENDENT SOURCE OF GROWTH

It is sometimes argued that re-organizations may have contributed to EX growth. Senior level people are usually most needed in the early set-up days of an organization with the result that constant organization change will create pressure for an increased number of EXs. This assumes that the rate of organizational change has increased over time, a proposition that is difficult to support using existing data sources which are not good at capturing organizational changes particularly within departments and agencies.

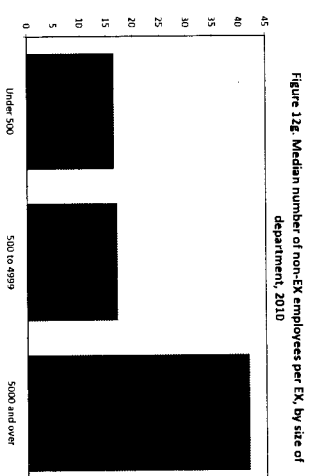
Moreover, informal work with experts from COSO represented departments suggest that it is not possible to examine the effects of organizational change independent of the changes to the nature of the work and of responses to new priorities that have already been discussed in Sections 4 and 5.

Organizational changes are either an integral part of responding to changed policy priorities (already discussed) or they are made for efficiency reasons. In the latter case, they are unlikely to result in upward pressures on numbers of employees.

DEPARTMENTAL SIZE

It is often observed that a smaller agency will need relatively more senior positions than a large organization when compared with total numbers of employees. That is, regardless of departmental size, there will still need to be senior people reporting to the deputy or head of the agency dealing with financial control, audit, HR and the like. They will, of course have far fewer people reporting to them, in total, than would be the case in a larger agency. **Figure 12g** suggests that this is true to a point. The very largest departments do have more employees reporting to each EX on average, but the difference between small- and middle-size department is not great. Presumably, more functions are shared in smaller departments and are carried out by specialists who are not EXs. (See Section 5 for concepts used in constructing **Figure 12f**.)

Regardless, size would only make a difference in overall EX trends if there had been significant changes in the size distribution of organizations in the CPA during the period being examined. That has not happened in this case. Births, deaths and reorganizations did not have a large effect on organizational size in the past decade. For example some 12 small organizations (under 500 employees) were created and some 10 disappeared between 2000 and 2009.



13. Conclusions and further work

The number of EXs in the CPA has grown faster than has the total number of employees

- That increase is the result of the interplay among a large number of factors. The following likely play the largest role overall:

- The changing nature of the work of EXs. The employees reporting ultimately to EXs may be smaller in number, but the nature of their work may be more complex and knowledge-intensive.
- Also the growth in the EX ranks has been in line with overall growth in the expenditures for which they are responsible. Accountabilities for both human and financial resources have risen.
- An increasing number of specialist managers in areas such as finance, HR, audit and evaluation

- The actual balance of factors varies widely from department to department and reflects factors such as meeting new government priorities, organizational changes, the use of associate positions and many others. However, these are not likely to have had large effects on the CPA taken as a whole.

- Many factors that have sometimes been associated with growth issues -- such as span of control, length of time in position, use of acting appointments, classification creep etc -- may be problematic from some perspectives, but have not likely had a big, independent effect on overall growth

- The growth has provided an opportunity to move forward rapidly on employment equity fronts. All the growth has been among designated groups

Has there been too much or too little growth in recent years?

If the issue is simply about growth per se, as opposed to an underlying concern about the total size of the EX cadre or of the public service as a whole, then the weak evidence that does exist suggests that the growth has been constrained artificially particularly at the ADM and EX-02 levels. That is, a case can be made that growth should have been larger on grounds of operational efficiency and effectiveness. This conclusion follows from a comparison with the separate employers where growth in comparable categories has been larger. An implication, given this interpretation, is that existing central controls on EX-04 and EX-05 positions may have been counter-productive.

However, it is likely that the issue is not about the growth of the executive group itself (a unique grouping used for internal pay purposes and bearing little relation to usual definitions of senior management). More likely the real issue is about either

- The growth of people doing the work of senior management, specialist management or middle management. This is an interesting question that should be readily addressed by decent HR data. However, the current state of our HR records makes analysis such as this almost impossible.
- Or, more likely, the real issue reflects a concern about the size of the executive group, not its growth, particularly since changes in the size of the EX cadre have historically led changes in the size of all employees. If the policy goal of the day is to downsize, then strong growth in the executive group is seen as negative.

Further work

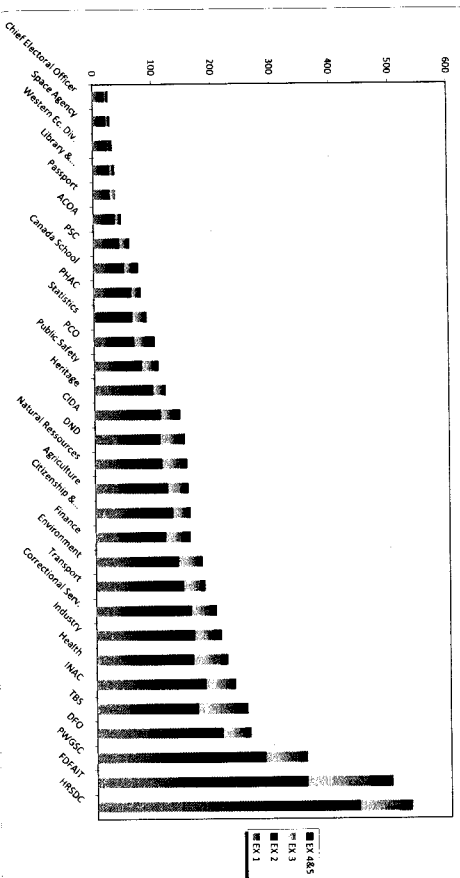
Regardless of how the issue is cast, there is a need to strongly re-enforce existing initiatives on the HR data front. The current system does a reasonably good job at paying people, but is very weak for most kinds of analysis. That involves fixing the system of administrative records. (For example we do not need to change the EX classification system simply because it is unusual; all we need to do is include good data on the records that does allow us to make meaningful comparisons). Action also involves greater exploitation of survey data. (See Annex B for an example of the use of census data.) Informal work with experts in COSO departments suggests that the analytic capacity in the HR area is also very mixed across departments.

If the issue is really about the growth of the executive group (or the management cadre), this paper suggests that, apart from the serious data issues above, existing evidence does not point to a major problem.

If the issue is really about the size of the executive group, then the projections in Section 3 may provide some suggestions about future directions. Future work should be primarily addressed to the size and growth of *occupational* groups -- i.e., senior managers (mainly EX-03 and up), other managers (mainly middle managers in line positions), and professional (or specialist) managers. It should examine the pressures that exist in the integrated internal labour markets for these management categories, including their feeder groups, including in feeder groups. An EX-based examination muddles the three groups, and tends to ignore the feeder groups where many problems become manifest and where solutions are to be found.

Annex A. Current data for CPA departments and agencies

Figure A1. Number of EX, selected larger departments, 2011



While the emphasis of the presentation is on the growth of the EX cadre, it is useful to have some background information on the current size of the EX population in the various CPA departments.

• **Figure A1** shows that a large percentage of all EXs are located in DFAIT (9.7% -- with many being part of the diplomatic corps)) and HRSOC (9.5%)

– The ten largest departments count for 56% of all EXs

• **Figure A2** uses the same data to show the percentage distribution of EX levels in each of the departments

– In this chart, the departments are ordered by the percentage of EXs that would be treated as senior executives in standard occupational schemes, namely EX-03s, EX-04s and EX-05s

– The percentage of these more senior executives is quite consistent across the larger departments

– Among EX-01s and EX-02s (mainly middle managers and heads of professional units), there is much variation across departments, even departments of comparable size

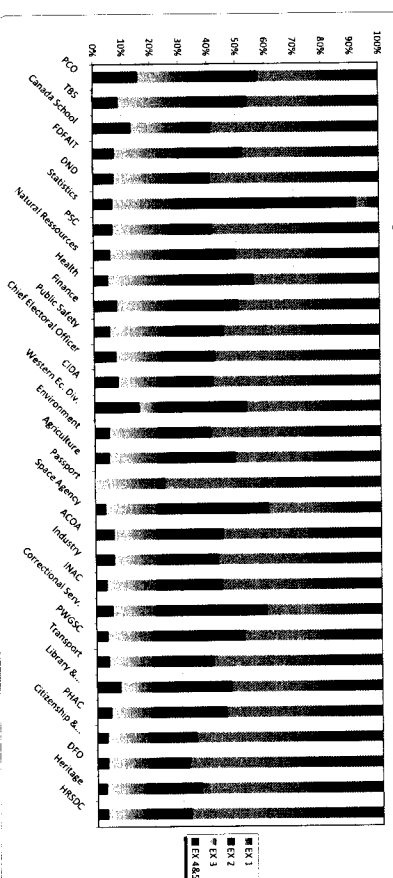
• **Figure A3** on the next page shows the number of EXs as a percentage of total employees in selected larger departments.

• **Figure A4** uses exactly the same data to express things the other way around -- the average number of employees that come under the direction of the EX cadre taken collectively. There are no surprises here

– There are a large number of EXs per total employees in the central agencies. Finance has 5 employees associated with each EX. TBS has 8. PCO has 10.

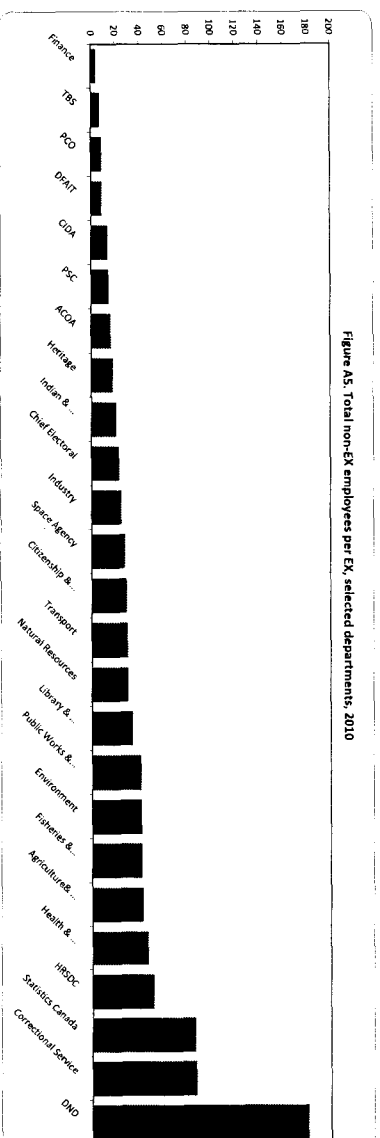
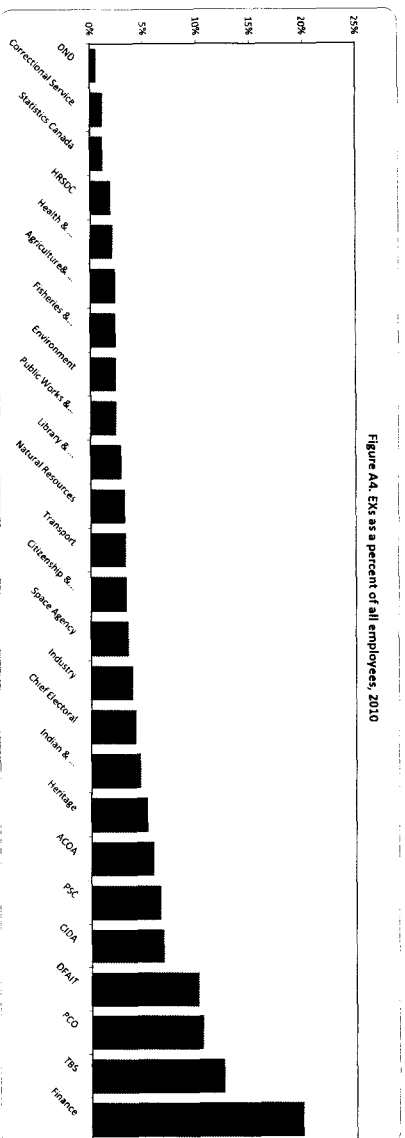
– At the other end of the spectrum are departments with large operational responsibilities where, naturally, there are far more employees per EX. DND, Correctional Services, Statistics Canada and HRSOC (in Service Canada)

Figure A2. Percent distribution of EXs by level, selected larger departments, 2011



See section 5 for an explanation of adjustments made to the departmental data

Annex A continued. Current data for CPA departments and agencies



Annex B. Using Census data to make other interesting comparisons

Census data has not been fully exploited in the analysis of the public sector. It can be used to make many other interesting comparisons.

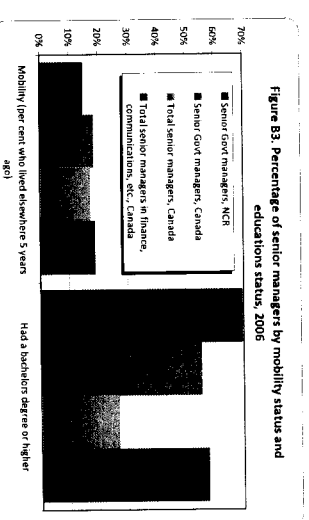
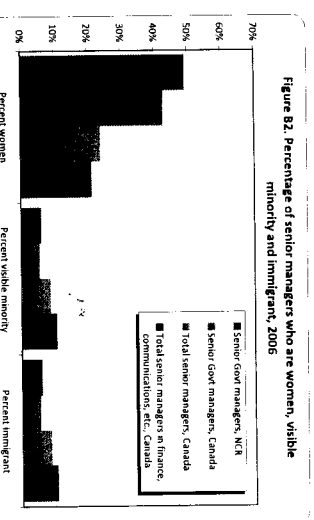
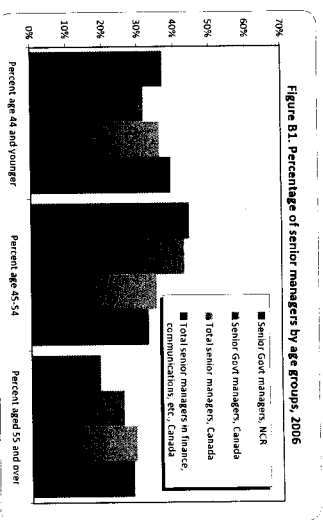
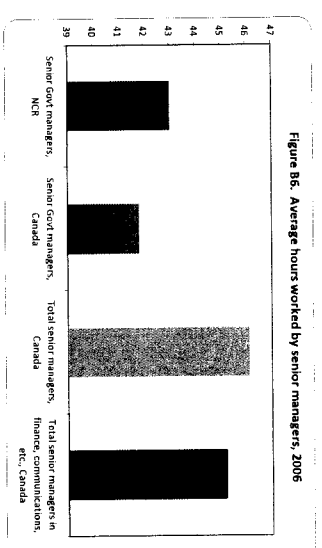
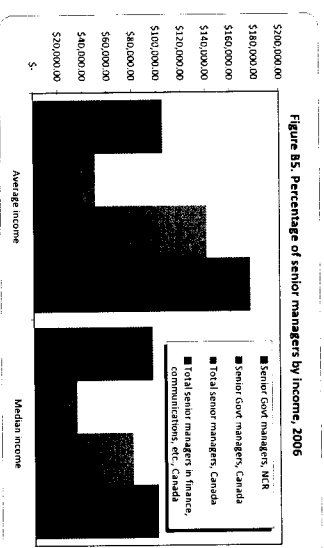
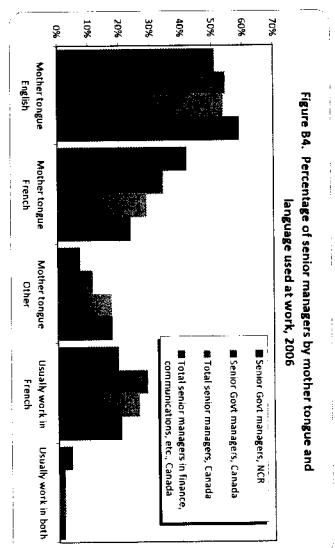
The figures on this page give a flavour of what is possible. The figures compare

- Senior government managers (mainly EX-03 and up) in Ottawa/Gatineau -- a total of 3,775 employees of whom 87% are coded as federal employees
- Senior government managers in Canada as a whole -- a total of 21,355 employees of whom 27% are coded as federal employees
- Total of all senior managers in Canada -- a total of 218,645 employees of whom 3% are coded as federal employees
- Senior managers in the private sector associated with the finance, communications and business services industries -- a total of 55,830 employees, none are in the federal sector

In these comparisons

- We have relatively more senior managers in the age group 45-54, relatively fewer who are either older than 55, and slightly fewer who are younger than 45
- The federal government compares well in female representation, but less well with visible minorities
- We have slightly fewer immigrants as senior managers than does the private sector
- Mobility (lived in a different city 5 years ago) is similar
- We have higher academic credentials
- More of us are francophone, and fewer of us have a mother tongue other than French or English
- Somewhat more of us speak both French and English at work
- Median income is higher than in other orders of government but similar to overall averages. Average income is lower -- meaning that income among the higher earners in the private sector is much higher
- Our average weekly hours are higher than in other governments, but well below those in the private sector

Tables that show separate data for the federal public administration only are potentially available, but have not yet been tabulated. They would provide much more direct and valuable comparisons. It would be most interesting to request these tables and a comparable set for the 2011 census when those data become available in about a year's time.





N11-125033

16 NOV. 2011

MEMORANDUM TO THE DEPUTY MINISTER

APPROVAL OF THE USE OF MOBILE TABLETS AT NRCAN

(Approval by November 23, 2011)

SUMMARY

- It is recommended that the standard for tablets, e.g. Apple iPad (WIFI+3G), be approved by you for usage in NRCan.
- Approval for individual devices would be granted at the ADM level, based upon a compelling business case.

BACKGROUND

From February to October 2011, senior NRCan managers piloted the Apple iPad and the RIM Playbook tablets. Participants appreciated the iPad and found it to be a useful mobile tool. The RIM playbook was found to be a less useful workplace device.

A memorandum was provided to you on September 12 (Tab 1), with recommendation to approve the iPad as a supported device for NRCan, and to develop processes for acquisition, application management, configuration and usage, as well as device support.

CONSIDERATIONS

If approved by you, the use of tablet devices in NRCan will be closely managed. Processes have been developed to obtain and use tablets. Only NRCan purchased tablets (Apple iPad with WIFI+3G) would be supported.

Tablets should only be used in cases where blackberries and laptops do not meet the business requirements. As per TBS guidance, multiple IT devices per user will not be permitted (i.e. a blackberry, a laptop and a tablet). This is why a business case requiring ADM approval will be necessary. A technical approval will also be done by the CIO group prior to procurement. Please refer to Tab 2 for process details.

NRCan tablet users will be required to abide by the iPad user agreement (Tab 3), and be familiar with the wireless electronic messaging standard (Tab 4). Applications for use with the tablets must be purchased through e-procurement, as per the process identified in Tab 2. The base configuration of the standard tablet is detailed in Tab 5.

Support costs (\$800.00 per device per year) will be recovered on an annual basis by CMSS from Sectors (i.e., user pay).

RECOMMENDATIONS

It is recommended that the standard for tablets, e.g. Apple iPad (WIFI+3G), as detailed in Tab 5, be approved by you for usage in the department.

It is also recommended that the management processes described in Tabs 2-4 be implemented by CMSS to ensure proper management, support and usage of these devices.


Bill Merklinger, ADM-CMSS and CFO

Attachments: (5)

Tab 1: BN to DM dated September 12, 2011.

Tab 2: NRCan Processes for procurement of tablets and applications

Tab 3: NRCan iPad User Acceptance Agreement - NRCan Resource Wiki

Tab 4: NRCan Wireless Electronic Messaging standard - Review page - NRCan Resource Wiki

Tab 5: Apple iPad Base Configuration - NRCan Resource Wiki

Contact: Michel Lessard 943-0469
CMSS / CIO & DG - IMB

*We should bring
this to Exec*

I agree ☒
I disagree ☐
I wish to discuss ☐


Serge A. Dupont, Deputy Minister

Date: **NOV 24 2011**



N11-123017

MEMORANDUM TO THE DEPUTY MINISTER

SEP 12 2011

MOBILE DEVICES RECOMMENDATION – APPLE iPad Vs PLAYBOOK

(Meeting of September 14, 2011)

SUMMARY

- The Apple iPad was preferred over the Blackberry Playbook by the vast majority of pilot participants.
- The iPad is an acceptable secured mobile device as long as information is restricted to Protected A and below.
- There are on-going support costs (\$800) associated with these mobile devices and it will take up to three months for the implementation of iPads in NRCan.
- On September 14 (3:30 – 5:00 p.m.), Michel Lessard and I are scheduled to brief you and the ADMs on this issue.

BACKGROUND

In February 2011, NRCan undertook two mobile device pilots with senior managers. The Apple iPad was evaluated first, followed by the RIM Playbook. Similar evaluations were conducted in many other federal departments.

CONSIDERATIONS

Throughout the government, pilot configurations ranged from closed (i.e. the device was essentially stand-alone) to open (i.e. with e-mail and calendaring connectivity). Departments that used open configurations like NRCan reported greater user satisfaction than those who used closed configurations.

At NRCan, participants greatly preferred the iPad over the Playbook. The iPad had a more usable form factor, was easier to use, and had better application support. Both

devices do not support PIN-to-PIN messaging, as the BlackBerry does. The iPad was viewed as a useful complementary tool by the participants. While it was not viewed as essential, most participants would prefer to continue using the iPad. Most Playbook participants expressed the wish to trade their Playbook for an iPad.

From a security point of view, the open configuration is acceptable, providing that information on the devices is restricted to Protected A and below. The open configuration is as secure as an NRCan laptop outside of the NRCan network. Both the iPad and the Playbook offer similar levels of security. Certification and Accreditation will have to be done for this device.

Support for mobile devices is not insignificant. It represents an additional device to provision and maintain. Data from the pilot project estimates that each device costs approx. \$800 per year in support, in addition to the cost of the device itself. Processes for application (Docs to go, GoodReader, etc.) acquisition and management will need to be developed for this device.

In addition, the iPad must be configured with a cellular 3G connection at a cost of \$22.83 per month, cost that is included in the wireless contract transferred to Shared Services Canada. Many participants incurred significant roaming charges (USA and international) during the pilot.

CONCLUSION

The iPad is a viable business device for mobile users. The CIO recommends approving the iPad with an open configuration as a supported device for NRCan.

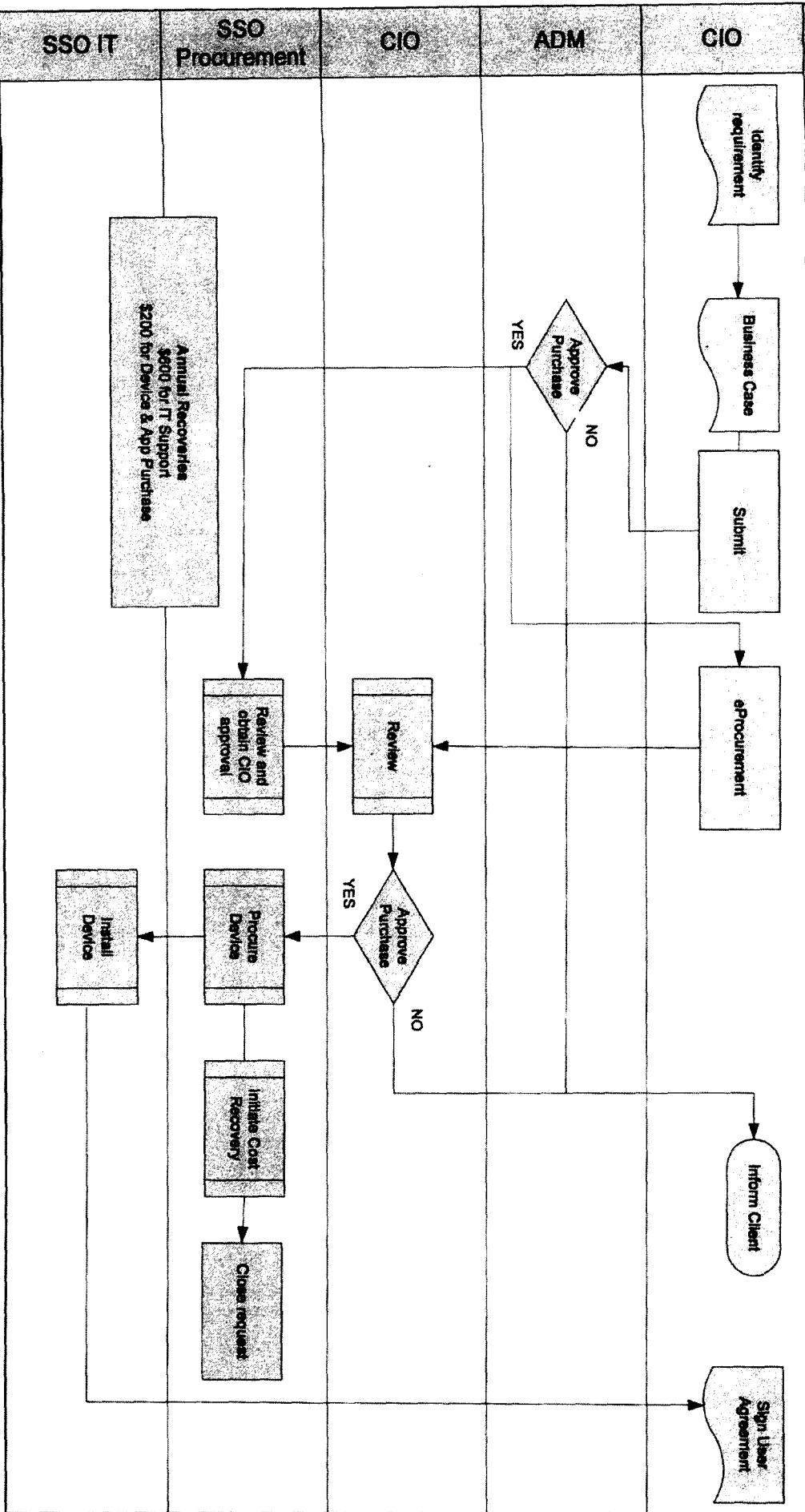
The deployment of iPads will require the development of processes for acquisition, application management, configuration and usage, as well as device support (budget transfer of \$800 annually per device, excluding acquisition costs), which should be completed within Three months following management approval.

The RIM Playbook is not recommended for implementation at this time.

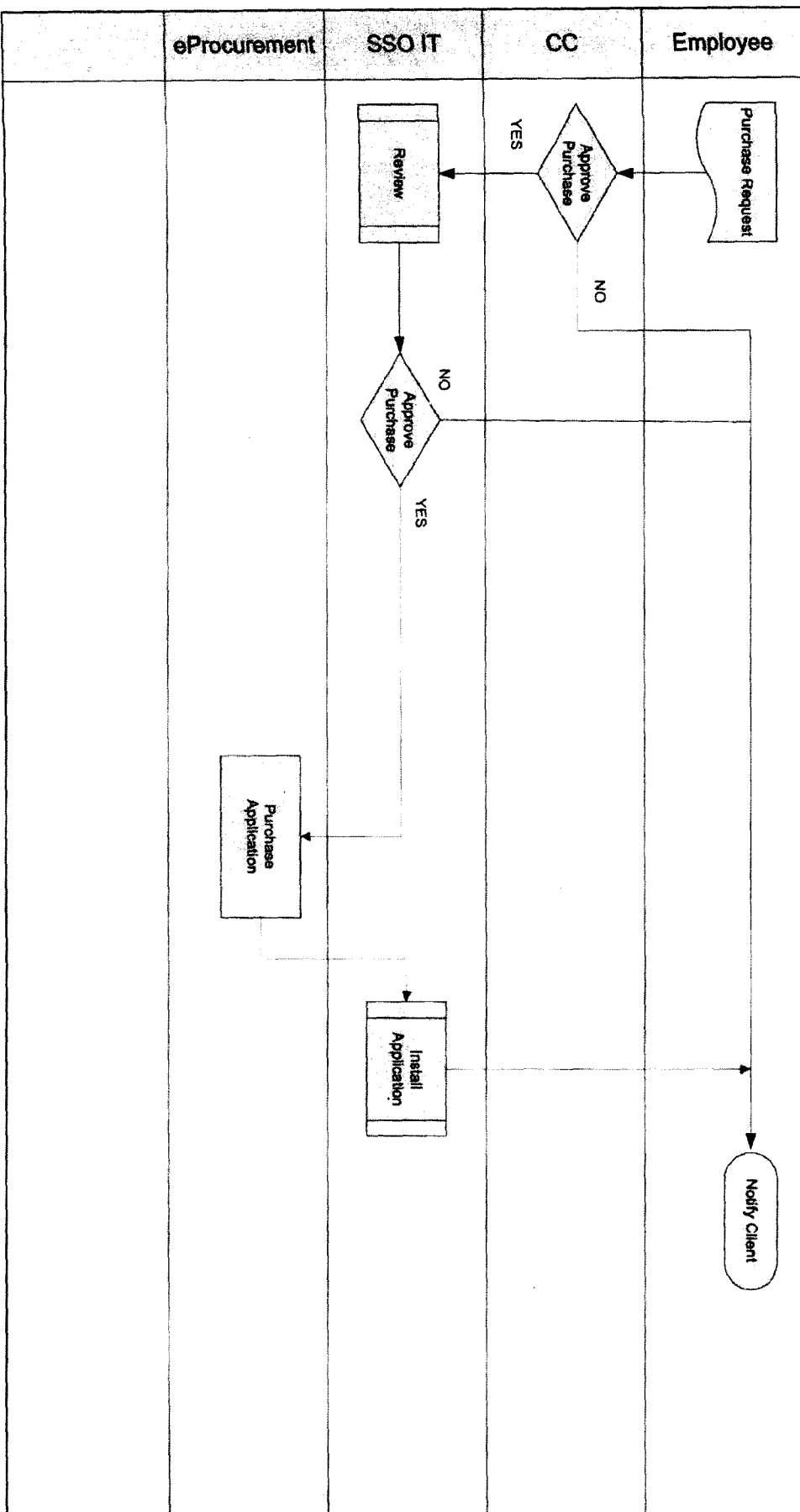

Bill Merklinger, ADM-CMSS and CFO

Contact: Michel Lessard, CIO, (613) 943-0469
DG-IMB, CMSS

iPad Device Procurement Process



iPad Application Procurement Process



NRCan iPad User Acceptance Agreement

From NRCan Resource Wiki

This document is a draft for discussion. Document name is subject to change.

Created by Denys Tremblay, Manager IT Security Program, IMB

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- 1 iPad(r) User Acceptance Agreement
- 2 Introduction:
- 3 User Responsibility:
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- 6 Important Information:
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iPad(r) User Acceptance Agreement

Introduction:

As a NRCan authorized user of the departmental network, you have the responsibility to ensure that the information and assets entrusted in you are handled in a secure manner. The portable device you are acquiring - namely the Apple iPad comes with a series of safeguards listed below, and in the Wireless Electronic Messaging Standard, to help ensure that the confidentiality, integrity and availability of the information contained on the device is protected. This user agreement is issued under the authority of the NRCan Chief Information Officer (CIO).

User Responsibility:

- It is important to ensure the physical protection of the tablet device. Unlike laptop computers, they do not have the capability to attach a cable lock. Keep the device under your control at all times, and never assume that is safe just sitting around.
- In the event that the device is lost or stolen, immediately inform the Shared Services Office IT Service Desk to have it remotely wiped. Report the loss of the device to the Security, Safety and Emergency Management Division (SSEMD).
- The use of the device is governed by the NRCan Policy on the Use of Electronic Networks, and is intended for legitimate business usage; limited personal use conditions are also covered by the policy. You are not authorized to share the device or to disclose your password to another person. You are responsible for the information located on the device, including backing up files to a separate location (such as your departmental desktop or network drive) if required.
- The sensitivity of the information stored and processed on this device may only be **up to and including Protected A**. No Protected B, C or Classified (Confidential, Secret or Top Secret) information shall be created,

transmitted or stored on the device.

- Given the portability of the device and the fact that it may be removed from the physical security afforded by NRCan facilities, users should consider carefully before putting anything of a sensitive nature on the device.
- The use of personal storage networks (also known as "cloud services", such as iCloud, Dropbox, etc.) is also prohibited for Protected or Classified information, as these platforms are not certified by the Government of Canada.
- Tampering with the device in order to circumvent functionality or security (such as "jailbreaking") is strictly prohibited, and access to departmental resources will be blocked.
- Business applications to be installed on the devices must be purchased using eProcurement.
- Request for purchasing applications that are not part of the initial installation of the device will be evaluated by the Chief Information Officer for approval.

Costing Model:

The cost of the device is entirely at the charge of the user. In addition, the Shared Services Office will require an annual fee of 800\$ from the user, to cover support costs for the procurement and management of the devices and the supporting applications. All applications that are not already installed on the device are at the charge of the user.

The costs involved for connectivity to a cellular network (such as 3G) are entirely at the expense of the user. Be advised that, in some cases, additional charges caused by roaming may be billed if you travel to a different country or continent. It is your responsibility to contact your cellular provider to determine the most beneficial plan prior to such occasions.

General configuration of the devices:

- Details of the configuration can be found in the Wireless Electronic Messaging Standard and the iPad Configuration document.
- Backup of information is the responsibility of the user; no backups are performed by support personnel. For iPads, backups must be encrypted using the encryption feature in iTunes.
- Access to corporate email, calendar and contacts is provided via Active Sync to the BlackBerry Enterprise Server

Important Information:

Users should be aware that the Shared Services Office, on behalf of the CIO, may perform random checks to ensure that compliance with departmental policies and standards is maintained during the usage of the device.

User Acceptance:

By completing the information below and providing a signature, users acknowledge that they have read and understand this UAA in its entirety, and agree to be bound by the terms and conditions herein.

This UAA is subject to change. Users will be notified and will be required to complete and sign a new form whenever the document is modified.

Name (print): _____

Title (print): _____

Phone: _____

Email: _____

Sector: _____ Branch/Division: _____

User signature: _____

Date (yyyy/mm/dd): _____

Retrieved from "http://wiki.nrcan.gc.ca/index.php/NRCan_IPad_User_Acceptance_Agreement"

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Wireless Electronic Messaging standard - Review page

From NRCan Resource Wiki

La version française suivra sous peu.

This document is a draft for discussion. Document name is subject to change
Created by Denys Tremblay, Manager IT Security Program, IMB

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- 3 Application
- 4 Technical Application
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- 10 Appendix A - Roles and Responsibilities

Effective Date

December 2011

Objective

The objective of this standard is to define the specifications for the technology and configuration required to support wireless access to the departmental electronic messaging system (email). The standard is designed to enhance the Department's overall security posture in accordance with applicable NRCan and Government of Canada (GoC) security policies and to minimize the exposure to damages that may result from unauthorized use or from accidental or unintended damage during authorized use.

Application

This standard applies to all authorized users, IT practitioners and Cost Centre (CC) Managers in NRCan requiring a supported device as described in this standard.

Technical Application

This standard applies to all departmentally-owned devices that are configured to wirelessly access the Departmental Electronic Messaging system. No personally-owned devices are supported under this standard.

Authority

This standard is issued under the authority of the Departmental Chief Information Officer (CIO).

Specifications

Supported Devices

The following wireless devices used to access the departmental email system are supported by the department. Those device must be owned by NRCan, and no personally-owned devices will be allowed access to departmental network resources:

- Research in Motion (RIM) Blackberry devices (all models)
- Apple iPad(r), with operationg system iOS 4.3 or higher (only models with wifi + 3G network)

Supported Applications

The following business applications are supported by the department:

RIM BlackBerry:

- Email, Calendar and Contacts via the BlackBerry Enterprise Server
- Web browser
- Docs to Go (Word, Sheet and Slideshow)

Apple iPad:

- Support for Active Sync via the Microsoft Exchange Server
- Web browser
- Citrix Receiver
- Docs to Go
- Goodreader

Sensitivity of information

Due to the mobile nature of the device, and the higher risk for loss or theft, only information at the Protected A or below level can be stored or transmitted using those devices. It is prohibited to store or process Protected B, C or Classified (Confidential, Secret, Top-Secret) information.

Configuration of messaging services and supported devices

The departmental Blackberry Enterprise Server (BES) serves as the wireless connection between an authorized user's

BlackBerry handheld device and the departmental email system. The iPad uses Active Sync to provide the same connectivity. The following documents describe the configuration of the mobile devices:

- RIM Blackberry handheld configuration
- Apple iPad tablet configuration

Procurement

Supported devices, and additional business applications to be installed on the device shall be purchased according to the *NRCan IT Products and Services Procurement Policy*, and the *Directive on Mobile (Wireless) Telecommunications*.

User Acceptance Agreement

All users must read and sign the User Acceptance Agreement before being allocated a supported device. Appropriate usage of the device is described in the NRCan Policy on the Use of Electronic Networks.

Qualifications

There are no exceptions to this standard. No other wireless devices are supported for access to departmental electronic messaging system. Supported devices that are tampered with in order to circumvent the functionality or security of the devices will be denied access to departmental network resources and removed from the user.

Next Review Date

December 2012

References

Government of Canada Publications

- Policy on Government Security
- Operational Security Standard: Management of Information Technology Security
- Directive on Departmental Security Management

Departmental Publications

- Departmental Security Policy
- Policy on the Use of Electronic Networks
- Authentication Management Standard
- Directive on Mobile (Wireless) Telecommunications
- IT Products and Services Procurement Policy

Appendix A - Roles and Responsibilities

"Authorized Users" of NRCan's wireless devices are accountable for using the devices in accordance with NRCan's Policy on the Use of Electronic Networks.

"Cost Centre (CC) Managers " are accountable for evaluating and approving, in consultation with the ITSB, an authorized user's request for access to the restricted VPN service and for all costs associated with the required trusted device.

"Departmental IT Security Coordinator" is responsible for certifying and accrediting as secure the wireless electronic mail services in accordance with this standard, and for providing advice and guidance that will increase the security configuration of wireless electronic mail services, where required.

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Apple iPad Base Configuration

From NRCan Resource Wiki

Hardware

Model: iPad 2
Minimum memory : 32GB
Connectivity : Wifi and 3G (Rogers is the default 3G supplier)
OS: IOS 5.0 and above
Backup and update conduit: iTunes (iCloud not supported at this time)

Configuration

Cellular data: Data roaming off
General: Auto lock 15 minutes
Passcode lock on
Simple passcode on
Erase data on after 5 failed attempts

Software

ActiveSync support for e-mail
Documents to Go
Goodreader (PDF reader with annotation capability)
Citrix Receiver
McAfee EMM (enterprise management agent)

You can find the iPad User Acceptance Agreement and the Wireless Electronic Messaging Standard here.

Retrieved from "[http://wiki.nrcan.gc.ca/index.php/Apple iPad Base Configuration](http://wiki.nrcan.gc.ca/index.php/Apple_iPad_Base_Configuration)"

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N11-126916

MEMORANDUM TO THE DEPUTY MINISTER

DEC 01 2011

USE OF NRCAN'S ELECTRONIC NETWORKS AND FACILITIES

(Decision/Signature Required by December 8, 2011)

SUMMARY

- At the Labour-Management Consultation Committee (LMCC) meeting held on June 3, 2011, you had indicated that you would consider a request from bargaining agents (BAs) regarding their use of NRCan's electronic networks.
- A decision is required on whether or not NRCan should allow BAs to use NRCan's facilities and electronic networks at their discretion, without seeking prior permission.
- As NRCan must ensure compliance with Collective Agreements, as well as with both the Government of Canada and NRCan policies, directives and guidelines, it is recommended that you approve the attached letter (Tab 1) advising BAs that they must continue to follow established procedures.

BACKGROUND

This issue was raised at the June 3, 2011 NRCan LMCC meeting, by the Canadian Association of Professional Employees (CAPE).

CAPE requested that relevant policies be amended to reflect a previous Deputy Minister's statement that BAs did not need to seek permission before using NRCan's facilities or electronic networks.

You replied that you would consider this request and return to the BAs with a decision before the next LMCC.

CONSIDERATIONS

As the Employer, NRCan must ensure compliance with Collective Agreements, as well as with Government of Canada and NRCan policies, directives and guidelines. These

instruments provide for the direction on the proper use of electronic networks, facilities and other mediums managed by the Employer. Specifically, Collective Agreements include clauses on the use of Employer facilities which, in this regard, address the roles and responsibilities of both the Employer and BAs. Those clauses indicate the following:

- BAs must seek Employer's approval before posting notices to Employer-provided bulletin boards, except in cases of union business affairs (e.g. names of representatives, social and recreational events). Such permission is not to be unreasonably withheld.
- Access to the Employer's premises is to be granted for BAs to assist in the resolution of a complaint or grievance, or to attend meetings called by management. There is no provision to provide unlimited access to facilities without prior Employer permission.

NRCan's approach is consistent with that of other departments and in line with Treasury Board guidance.

RECOMMENDATIONS

It is recommended that NRCan maintains the position that both parties must continue to proceed as required under these negotiated parameters, and that you sign the attached letter (Tab 1) advising BAs that they must continue to follow established procedures.


Bill Merklinger, ADM-CMSS and CFO

Attachment: (1) Letter to NRCan CAPE President

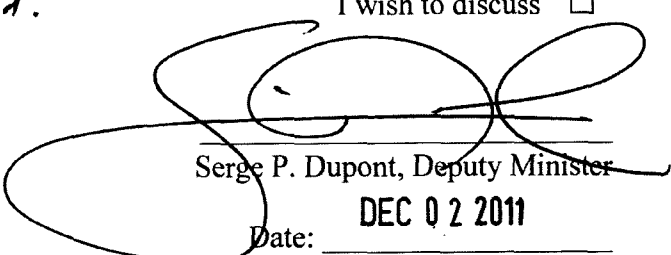
Contact: Nathalie Leblanc, 613-995-0416
HRSMB/CMSS

*Letter slightly
m. dated.*

I agree ☒

I disagree ☐

I wish to discuss ☐


Serge P. Dupont, Deputy Minister

Date: DEC 02 2011



Natural Resources Canada Ressources naturelles Canada

Deputy Minister Sous-ministre

Ottawa, Canada
K1A 0E4

Mr. Allan Charles Howatson
President, NRCan CAPE Local 520
c/o Industry Economics and Taxation Division
Minerals, Metals and Materials Knowledge Branch
Minerals and Metals Sector
Natural Resources Canada
580 Booth Street, 10th Floor, Room A9-4
Ottawa, Ontario K1A 0E4

Dear Mr. Howatson:

At the last Labour-Management Consultation Committee (LMCC) meeting, I undertook to consider a request from bargaining agents (BAs) to allow them the use of Natural Resources Canada's (NRCan) electronic networks and facilities without having to seek prior approval from the employer.

I have since been briefed and reviewed the applicable framework and policies. As the employer, NRCan must ensure compliance with collective agreements, as well as with Government of Canada and NRCan policies, directives and guidelines. These instruments provide for the direction on the proper use of electronic networks, facilities and other media managed by the employer. Specifically, they set out that:

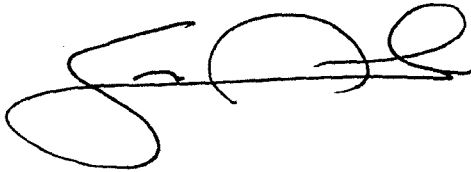
- BAs must seek employer approval before posting notices to employer-provided bulletin boards, except in cases of union business affairs (e.g., names of representatives, social and recreational events). Such permission is not to be unreasonably withheld.
- Access to the employer's premises is to be granted for BAs to assist in the resolution of a complaint or grievance, or to attend meetings called by management. There is no provision to provide unlimited access to facilities without prior employer permission.

Canada

Accordingly, the department is of the view that both parties should proceed as per these negotiated parameters. Therefore, I request that BAs continue to follow the established procedure, and forward any messaging or requests to use employer facilities through Ms. Nathalie Leblanc, Manager, Labour Relations, Values and Ethics Unit, at 613-995-0416.

I look forward to our next meeting on December 15, 2011.

Yours sincerely,

A handwritten signature in black ink, appearing to be 'S. Dupont', with a large loop at the end.

Serge P. Dupont
Deputy Minister
Natural Resources Canada

c.c.: LMCC members (via distribution at December 15, 2011, LMCC)



MEMORANDUM TO THE DEPUTY MINISTER

30 JUL 27 2011
UPDATED OUTLOOK FOR ECONOMIC IMPACTS
OF OIL SANDS PROJECTS IN ALBERTA

(Information by July 27)

SUMMARY

- The purpose of this note is in regards to your recent questions as you prepared for your speech in the United States (U.S.) last week, this memo provides information on recent Canadian Energy Research Institute (CERI) studies, in particular its July 11, 2011, report: *Economic Impacts of Staged Development of Oil Sands Projects in Alberta*. (see Attachment 1)
- CERI has used an input-output (I/O) model approach for its studies. The July report projects the overall economic benefits of oil sands development based on different pipeline scenarios that could alter the supply and export dynamics of Alberta's oil sands over the next 25 years.
- The results of CERI's analysis should not be viewed as definitive as they are derived using a static model to estimate the economy-wide effect of future oil sands development over a 25-year period, which tends to overstate these economic impacts.

BACKGROUND

Over the years, CERI has released a number of studies that used an I/O methodology (see Attachment 2) to forecast the positive economic spin-offs (direct, indirect and induced) of the petroleum sector in Alberta, in particular the oil sands, to the rest of Canada and the U.S. These studies include:

- **May 2005**, *Spreading the Wealth Around: The Economic Impacts of Alberta's Oil Sands* focused on the positive economic impacts from the oil sands sector to the rest of Canada;
- **July 2009**, *Economic Impacts of the Petroleum Sector in Canada* extended this analysis to the other oil and gas sectors in Alberta and their economic spin-offs in Canada;

- **October 2009**, *The Impacts of Canadian Oil Sands Development on the United States Economy* estimated the economic benefits of oil sands development to the U.S. economy;
- **May 2011**, *Economic Impacts of New Oil Sands Projects in Alberta (2010–2035)* estimated the economic impacts from new oil sands projects over the next 25-years across both Canada and the U.S., but does not include future contributions from existing oil sand projects.

In its latest **July 2011** report, *Economic Impacts of Staged Development of Oil Sands Projects in Alberta*, CERI uses a four-case scenario approach to model the potential economic benefits from both existing and new oil sands developments over the next 25-years based on different key pipeline infrastructure being built.

Natural Resources Canada (NRCan) has done some analysis to draw out key findings and estimates to help articulate the potential of future oil sands development, which are summarized below. To provide context to these forecasts, information is first provided on 2010:

2010 Oil sands information:

- Production: 1.5 million barrels per day (MMB/D);
- Gross Domestic Product (GDP): estimated at \$15 billion (B)¹; and
- Direct employment: estimated to be between 40,000 and 50,000².

Case 1: Existing pipelines only

- Production: peaks at 3.1 MMB/D in 2020;
- Cumulative Canadian GDP (from direct, indirect and induced impacts of the oil sands over 25 years): \$2.3 trillion (T), with the oil sands direct contribution averaging \$31B per year; and
- Direct Employment: peaks at 163,000 jobs in 2020.

Case 2: Case 1 + Keystone XL

- Production: peaks at 3.8 MMB/D in 2020;
- Cumulative Canadian GDP: \$2.9T, with the oil sands direct contribution averaging \$40B per year; and
- Direct Employment: peaks at 229,000 jobs in 2020.

Case 3: Case 1 + Keystone XL + Northern Gateway

- Production: peaks at 4.3 MMB/D in 2020;
- Cumulative Canadian GDP: \$3.3T, with the oil sands direct contribution averaging \$45B per year; and

¹ Estimate derived from Statistics Canada GDP data for the Oil and Gas Extraction and Support Services Sectors, disaggregated based on the level of production from each subsector, including oil sands in 2010.

- Direct Employment: peaks at 268,000 jobs in 2020

Case 4: All oil sands projects proceeding with accompanying development of necessary pipeline infrastructure

- Production: peaks at 7.0 MMB/D in 2035;
- Cumulative Canadian GDP: \$4.9T, with the oil sands direct contribution averaging \$67B per year; and
- Direct Employment: peaks at 533,000 jobs in 2020.

A detailed table that compares the estimates under each pipeline scenario, as well as those estimated in CERI's 2009 and May 2011 studies is provided under Attachment 3.

CONSIDERATIONS

I/O models, including the one used by CERI, tend to over estimate the economic impacts as the projections are dependent on multiple assumptions, which include:

- **Static economy, government policy and environmental regulations**

CERI's model is based on the Statistics Canada I/O matrix for 2006 and assumes that this structure does not change throughout the forecast period. As such, the effects created by the introduction of efficiency, productivity and technological gains, as well as any future government policies that impose a price on carbon or other climate change mitigating policies or requirements are not taken into account. I/O models also assume prices (such as oil prices) remain constant and, as such, are unable to model the interaction between price, investment and production.

- **Unlimited resources or supplies**

The I/O approach assumes that there are no supply or resource constraints, (e.g. labour). However, in the short run, increasing economic activities may create shortages in supplies, such as labour that put pressure on prices and wages, which could ultimately affect overall production capacity.

- **2006 fiscal regimes**

The forecasts for tax revenues and royalties assume that the applicable rules and rates from 2006 remain in effect throughout the forecast period. Tax rates, including personal, corporate and sales taxes, have all declined since 2006. Thus, the projected tax revenues associated with the total (direct, indirect and induced) economic activity resulting from the oil sands are likely over-stated.

² Estimate derived from Statistics Canada Survey of Employment, Hours and Payroll for the Oil and Gas Extraction and Support Services Sectors, disaggregated based on the level of production in 2010.

We believe that the CERI Case 4 scenario is too optimistic. It assumes that all oil sands
s.13(1)(c) investments will proceed with accompanying development of all necessary pipeline
s.20(1)(b) infrastructure. [REDACTED]

[REDACTED] we also agreed to consider
whether it might be more appropriate to limit our focus to the next 10-year period. We are
planning to discuss this option with CERI shortly.

CONCLUSION

While CERI's study uses a generally-accepted statistical technique for measuring a
sector's incremental economic contributions and spin-offs to the Canadian and U.S.
economies, the results should not be viewed as definitive. The economic benefits
identified are dependent on the underlying assumptions and base year of the I/O analysis.

It is recommended that when quoting the results of this study, a range between Case 1 and
Case 3 be used, noting that the results are dependent on gaining new market access to the
U.S. (Case 2 via Keystone XL) and Asia (Case 3 via Northern Gateway). For Keystone XL
outreach, it is recommended that Case 2 results be used. We also suggest that it may be
most prudent to reference existing Statistics Canada data, along with a range of the direct
benefits attributable to the oil sands estimated by CERI in its latest study.



Mark Corey

Attachments: (3)

Contact: James Zeni, 613-992-6780
Energy Policy Branch, ES

Canadian Energy Research Institute

Economic Impacts of Staged Development of Oil Sands Projects in Alberta (2010-2035)

Afshin Honarvar
Jon Rozhon
Dinara Millington
Thorn Walden
Carlos A. Murillo

Study No. 125 – Section I

June 2011



Relevant • Independent • Objective

000121

**ECONOMIC IMPACTS OF STAGED DEVELOPMENT OF
OIL SANDS PROJECTS IN ALBERTA (2010-2035)**

Economic Impacts of Staged Development of Oil Sands Projects in Alberta (2010-2035)

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Executive Summary

The worldwide economic recession that hit in 2008 affected the Canadian oil sands significantly. But close to three years later the industry is once again expanding, with a number of major projects under development and still more proposed for the future. Pipelines, or other transportation means such as increased rail haulage, will soon be required to ship new product to destinations in the United States and elsewhere. Three major transportation projects are being planned and have received considerable attention from government, stakeholders, and the general public:

- 1) TransCanada's Keystone XL Pipeline which, if approved by the United States State Department, will ship Alberta bitumen to the refineries of the United States Gulf Coast.
- 2) Enbridge's Northern Gateway Pipeline from Bruderheim, Alberta to the port of Kitimat, British Columbia, and
- 3) Kinder Morgan's Trans Mountain Pipeline system Northern Leg expansion to Kitimat, British Columbia.

These pipeline proposals face opposition, and the possibility exists that one, two, or all three may not be realized. This study examines the impacts of oil sands operations (existing and future) limited by pipeline export capacity. Four capacity scenarios, or cases, are documented within this report:

Case 1 – Existing pipelines operations. This case examines the economic impacts of existing oil sands operations and those that are still under construction. It assumes no new pipeline capacity and serves as a baseline scenario.

Case 2 – Existing pipelines operations + TransCanada Keystone XL Pipeline. This case considers the economic impacts of existing oil sands operations and those currently under construction. It assumes the Keystone XL pipeline comes on stream in 2013, and that a portion of approved oil sands projects not yet under construction will in fact become operational.

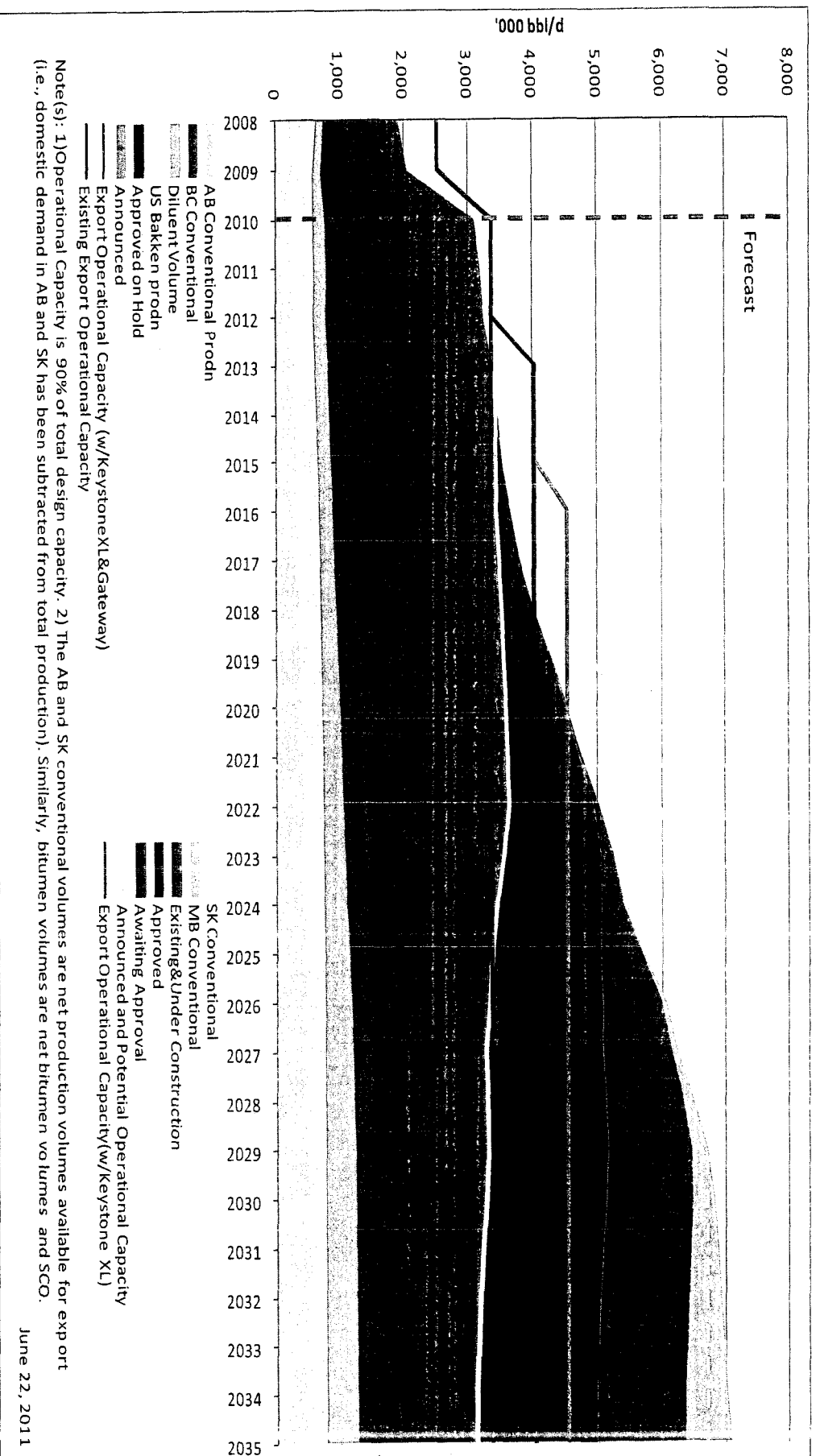
Case 3 – Existing pipelines operations + TransCanada Keystone XL Pipeline + Enbridge Northern Gateway Pipeline. Case 3 includes all of the projects considered in Case 2 and adds an additional portion of approved projects that can be accommodated by the Northern Gateway pipeline in operation by 2016.

Case 4 – Announced and Potential Capacity. This case assumes that, in addition to Case 3, all other remaining oil sands projects will proceed and that the required pipeline capacity to move new product will be constructed, including projects such as Kinder Morgan's Northern Leg expansion.

Figure 1 represents the supply and export pipeline dynamics over the next 25 years for each case. Existing pipeline operations capacity (Case 1) is denoted by the red horizontal line. If no infrastructure is built beyond existing operations, all of the volumes above the red line will not make their way to market. The blue horizontal line represents existing pipeline operations capacity + the capacity of TransCanada Keystone XL Pipeline (Case 2). If Keystone XL comes on stream, the additional volumes that can be transported lie between the red and blue lines. The oil sands projects that are above the blue line will not get built because there will be no take-away capacity to transport these crude volumes

to market. Existing + Keystone XL + Enbridge Northern Gateway Pipeline capacity (Case 3) are denoted by the orange horizontal line. If Northern Gateway comes on stream, the additional volumes that can be transported lie between the blue and orange lines. The oil sands projects that are above the orange line will not get built because there will be no take-away capacity to transport these crude volumes to market. Finally, the grey, dashed line represents all announced and potential operational capacity (Case 4). Even with a significant increase to the take-away capacity, not all oil sands projects will get built. The portion that will be left out is above the grey line.

Figure 1: Pipeline Capacity and Crude Exports



Source: CERl.

Major Findings

Case 1

- Over the 2010-2035 period, the estimated investments, reinvestments, and revenues from operation of the existing and under construction oil sands projects are **\$2,197 billion**.
- Total Canadian GDP impact as a result of the investment shocks is estimated at close to **\$2,283 billion** over the 25-year period (see Table 1.3).
- Canadian employee compensation will reach almost **\$650 billion** over this time period.
- Employment in Canada (direct, indirect, and induced) is expected to grow from **390,000 jobs** to a peak of **490,000 jobs** in 2020 (see Figure 1.4).
- Alberta royalties are expected to grow from **\$3.56 billion** in 2010 to a peak of **\$22.6 billion** in 2020 (see Figure 1.5).
- US GDP impact from 2010-2035, as a result of the investment shocks, is estimated at close to **CAD\$210 billion** (see Table 1.6).
- US employee compensation will exceed **\$100 billion** over the period.
- US employment totals are expected to grow from **80,000 jobs** to a peak of **94,000 jobs** in both 2018 and 2019 (see Figure 1.6).

Case 2

- Over the 2010-2035 period, the estimated investments, reinvestments, and revenues from operation of the existing and under construction oil sands projects + Keystone XL Pipeline are **\$2,821 billion**.
- Total Canadian GDP impact as a result of the investment shocks is estimated at close to **\$2,916 billion** over the 25-year period (see Table 1.8).
- Canadian employee compensation will reach almost **\$835 billion** over this time period.
- Employment in Canada (direct, indirect, and induced) is expected to grow from **390,000 jobs** to a peak of close to **690,000 jobs** in 2019 (see Figure 1.7).
- Alberta royalties are expected to grow from **\$3.56 billion** in 2010 to **\$27.6 billion** by 2035 (see Figure 1.8).
- US GDP impact from 2010-2035 as a result of the investment shocks is estimated at **CAD\$359 billion** (see Table 1.11).
- US employee compensation will exceed **\$171 billion** over the period.
- US employment totals are expected to grow from **80,000 jobs** to a peak of **179,000 jobs** in 2035 (see Figure 1.9).

Case 3

- Over the 2010-2035 period, the estimated investments, reinvestments, and revenues from operation of the oil sands projects under Case 1 and Case 2 plus projects that can be accommodated by the Northern Gateway pipeline are **\$3,208 billion**.
- Total Canadian GDP impact as a result of the investment shocks is estimated at close to **\$3,317 billion** over the 25-year period (see Table 1.13).
- Canadian employee compensation will reach almost **\$948 billion** over this time period.
- Employment in Canada (direct, indirect, and induced) is expected to grow from **390,000 jobs** to a peak of **790,000 jobs** in 2020 (see Figure 1.10).
- Alberta royalties are expected to grow from **\$3.56 billion** in 2010 to **\$32.9 billion** by 2035 (see Figure 1.11).
- US GDP impact from 2010-2035 as a result of the investment shocks is estimated at close to **CAD\$397 billion** (see Table 1.16).
- US employee compensation will exceed **\$189 billion** over the period.
- US employment totals are expected to grow from **80,000 jobs** to a peak of **200,000 jobs** in 2020 (see Figure 1.12).

Case 4

- Over the 2010-2035 period, the estimated investments, reinvestments, and revenues from operation of all oil sands projects are **\$4,783 billion**.
- Total Canadian GDP impact as a result of the investment shocks is estimated at close to **\$4,925 billion** over the 25-year period (see Table 1.18).
- Canadian employee compensation will reach almost **\$1,417 billion** over this time period.
- Employment in Canada (direct, indirect, and induced) is expected to grow from **390,000 jobs** to a peak of **1,600,000 jobs** in 2035 (see Figure 1.13).
- Alberta royalties are expected to grow from **\$3.56 billion** in 2010 to **\$65.2 billion** 2035 (see Figure 1.14).
- US GDP impact from 2010-2035 as a result of the investment shocks is estimated at close to **CAD\$775 billion** (see Table 1.21).
- US employee compensation will exceed **\$368 billion** over the period.
- US employment totals are expected to grow from **80,000 jobs** to a peak of **600,000 jobs** in 2035 (see Figure 1.15).

In all 4 cases, the oil sands affect Alberta much more than any other province. Ranked in order are the top 5 provinces most impacted by oil sands development:

1. Alberta
2. Ontario
3. British Columbia
4. Quebec
5. Saskatchewan

In all 4 cases, the following, ranked in order, are the top 5 states most impacted by oil sands development:

1. Illinois
2. California
3. Texas
4. New York
5. Wisconsin

Figures 2 through 5 isolate the impacts of each individual case, while demonstrating the overall impacts of all 4 cases summed together. Figure 6 illustrates the degree to which both Canada and the US are impacted by each case.

Figure 2: Canada Employment – Jobs (x 1,000) Created and Preserved, 2010-2035

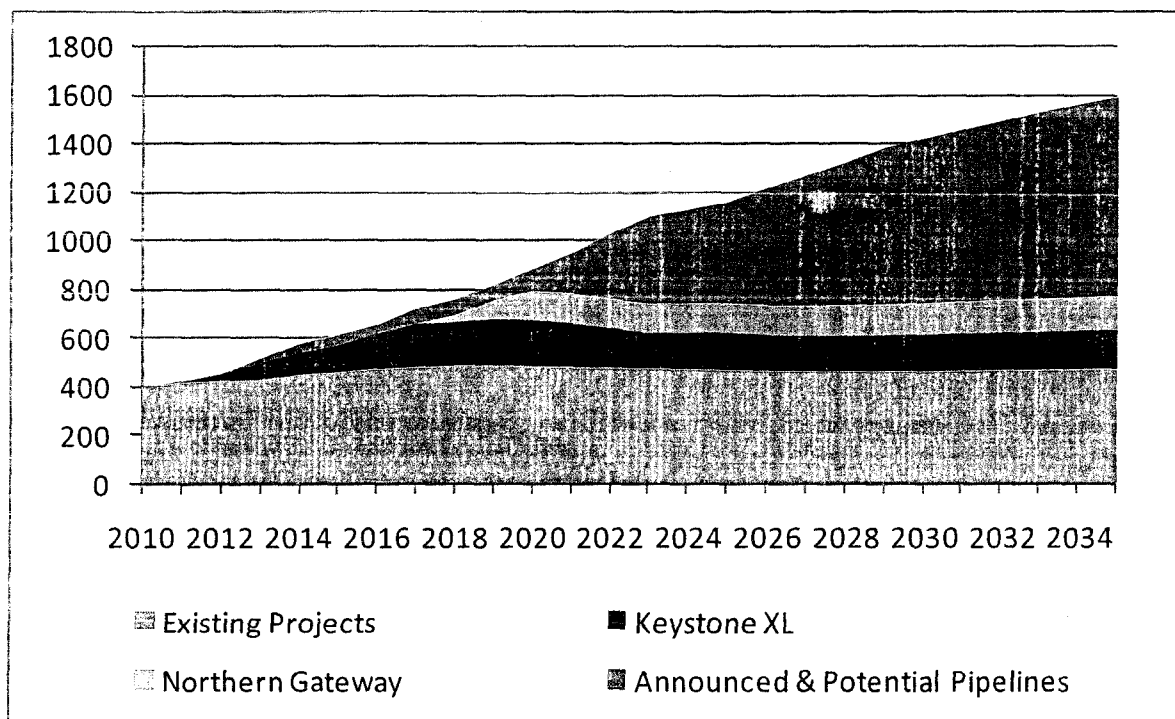


Figure 3: Canada GDP – Potential Additions, 2010-2035 – 4 Cases

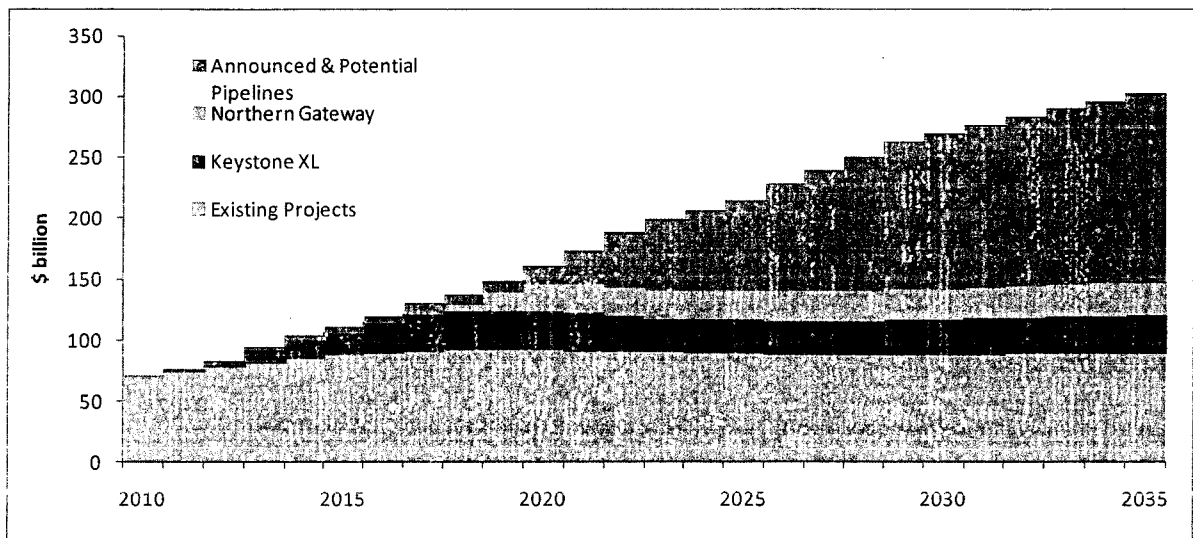


Figure 4: US Employment – Jobs (x 1,000) Created and Preserved, 2010-2035

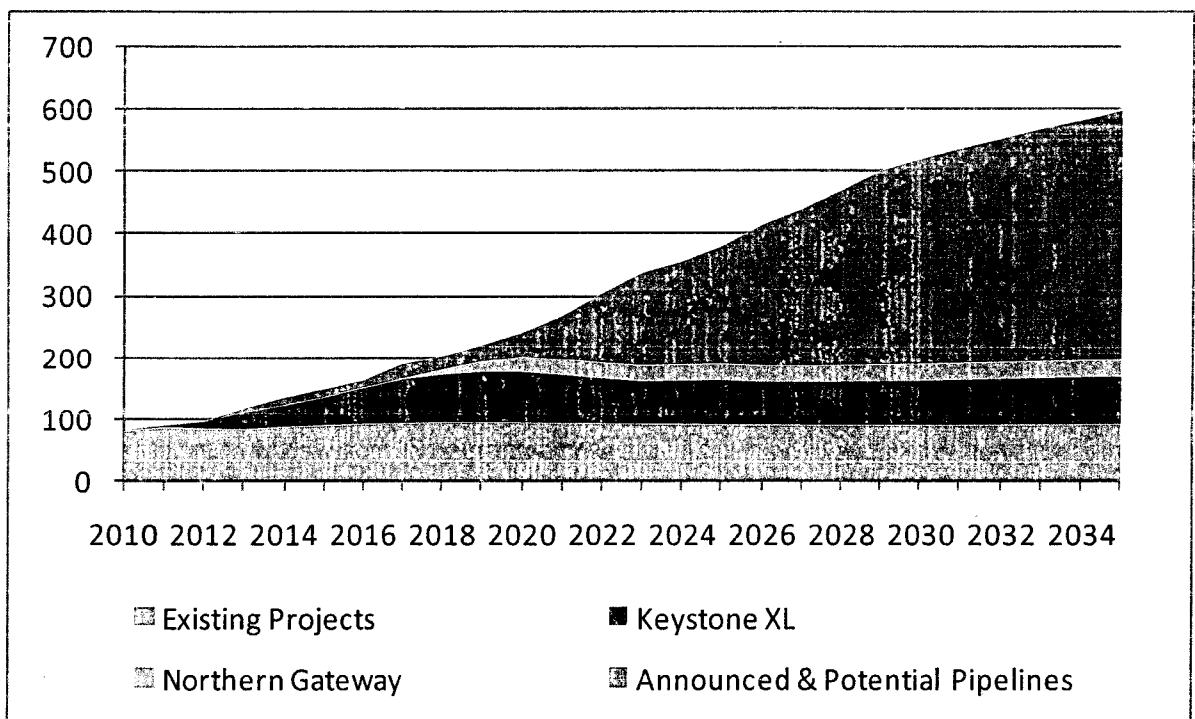


Figure 5: US GDP – Potential Additions, 2010-2035 – 4 Cases

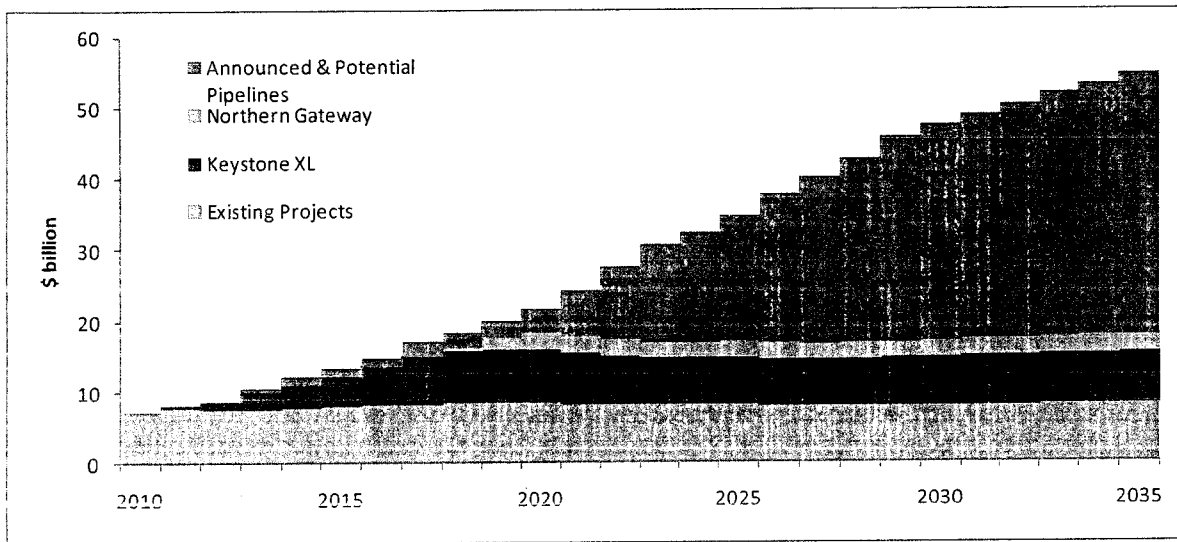
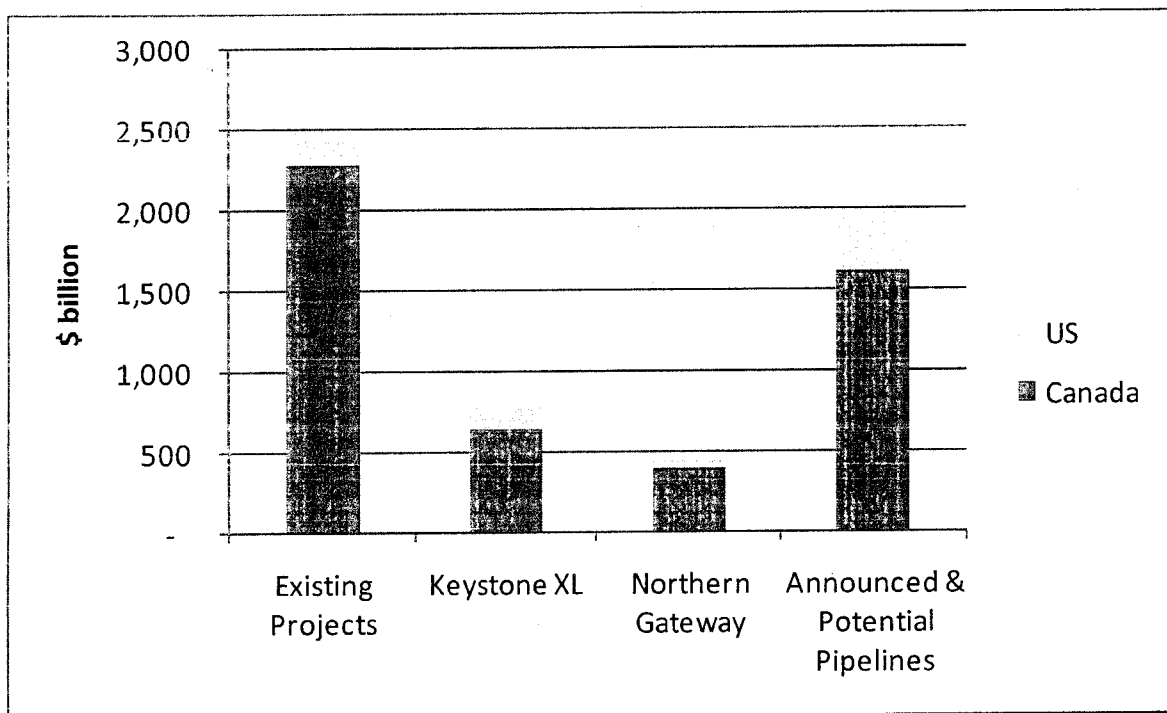


Figure 6: GDP Impact for the US and Canada, by Case



Terminology and Assumptions

- **Forecast Period** – The forecast period is 25 years, starting at the end of 2010, with 2011 being the first year of capital injections for the new oil sands projects and going out to 2035.
- All currency figures are in real 2010 (base year) Canadian dollars, unless specified otherwise.
- **Employment (Thousand Person Years):** Thousands of jobs created and preserved every year. For instance, if a new oil sands in situ project with a capacity of 10,000 BPD starts operation by hiring 60 people in the initial year, the employment is 0.06 thousand person years in the first year. If this new oil sands facility adds 5,000 BPD capacity in the second year and hires 25 more employees to operate the new facility, in the second year the in situ project has created and preserved 0.085 thousand person years of employment. Of the 0.085 thousand person years of employment, 0.06 represents preserved jobs and 0.025 refers to new jobs.
- **Jobs** – Thousand person years and jobs are used interchangeably throughout this report. Thousand person years is the unit for the number of people employed in a job for a year. A job is an occupation that one needs to do in order to be employed. This should not be confused with stating that a job is a position that one is hired into (i.e., as a plumber). For example, a company could hire 10 people in a year for a position as manager and not hire any managers for later years. For the first year, the total amount of jobs is 10 and the total amount of person years for that year is 10. However, for the second year, the total amount of manager jobs is still 10 but the person years are now 20 as 10 people have now worked for 2 years. While the definitions of job and person years of employment may be subject to interpretation, for the purposes of this report, the number 10,000 jobs and 10 thousand person years both denote that 10,000 people are employed for a year.
- **Taxes** – Note that all of the tax estimates presented in this study include direct, indirect and induced impacts. Generally speaking, taxes on income are considered direct taxes, while taxes on expenditures (such as GST, HST, and PST) and all taxes deductible by corporations for income tax purposes (such as property taxes) are considered indirect taxes. The tax impact on a province includes taxes generated by economic activity within a province payable to federal, provincial, and municipal governments.
- **PADD** – Petroleum Administration for Defence Districts. These are five groups of US states that were organized as such during WWII to ensure efficient distribution of petroleum resources. The groupings remain in place today.
 - PADD I – Connecticut, Delaware, District of Columbia, Florida, Georgia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia, West Virginia
 - PADD II – Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Ohio, Oklahoma, Tennessee, Wisconsin
 - PADD III – Alabama, Arkansas, Louisiana, Mississippi, New Mexico, Texas
 - PADD IV – Colorado, Idaho, Montana, Utah, Wyoming
 - PADD V – Alaska, Arizona, California, Hawaii, Nevada, Oregon, Washington
- **Oil Sands Projects** – The oil sands projects are reported by status in the following order: 1) on stream or existing; 2) under construction; 3) approved; 4) approved – on hold; 5) awaiting approval; and 6) announced.

Economic Impacts of Staged Development of Oil Sands Projects in Alberta (2010-2035)

Introduction

The existing crude oil pipeline infrastructure underwent a much needed expansion recently in order to accommodate growing volumes of oil sands production. A number of pipeline expansions were completed in 2009, and two major additional pipelines became operational at the end of 2010, namely TransCanada's Keystone and Enbridge's Alberta Clipper. Currently, there are several pipelines that are directly connected to the Canadian supply hubs, which are located in Edmonton and Hardisty, Alberta. These include: Enbridge Mainline, Kinder Morgan Trans Mountain, Kinder Morgan Express, Enbridge Alberta Clipper, and the TransCanada Keystone pipeline. The Alberta Clipper and Keystone pipelines have added 885,000 barrels per day (BPD) of pipeline capacity out of Western Canada, bringing the total export capacity to 3.5 million barrels per day (MMBPD) of crude oil, as shown in Table 1.1.

Table 1.1: Alberta Export Pipelines

Export Pipelines			
Name	Type	Destination	Capacity ('000b/d)]
Enbridge Pipeline	Crude oil	Eastern Canada US East coast US Midwest	1,868.0
Kinder Morgan (Express)	Crude oil	US Rocky Mountains US Midwest	280.0
Kinder Morgan (Trans Mountain)	Crude oil and Refined Products	British Columbia US West Coast Offshore	300.0
Enbridge Alberta Clipper	Heavy crude	US Midwest	450.0
TransCanada Keystone	Light/heavy crude	US Midwest	435.0
Milk River Pipeline	Light oil	US Rocky Mountains	118.3
Rangeland Pipeline	Cold Lake blend	US Rocky Mountains	84.9
TOTAL			3,536.2

Source: (1) Energy Resources Conservation Board (ERCB), "Alberta's Energy Reserves 2009 and Supply/Demand Outlook 2010-2019", ST98-2010, June 2010; and (2) CAPP, "Crude Oil Forecast, Markets, and Pipelines", June 2010.

The oil sands production projection profile under the Realistic Scenario in CERI Study 122 forecasts a significant increase;¹ add to that the forecast for Western Canadian crude oil production, and it becomes apparent that the current pipeline infrastructure in Alberta will not be sufficient to transport forecasted oil sands volumes. Expansion will be required.

Overall conventional crude oil production out of Western Canada has slowed down in recent years. However, the use of newer technology in mature fields in Saskatchewan, Alberta, and Manitoba is expected to increase light crude oil production from these provinces during the next few years. In particular, the industry is optimistic over the potential growth in production from the Cardium and Viking oil plays in Alberta, which promises an increase in production volumes similar to that witnessed recently from the Bakken formation in Saskatchewan.

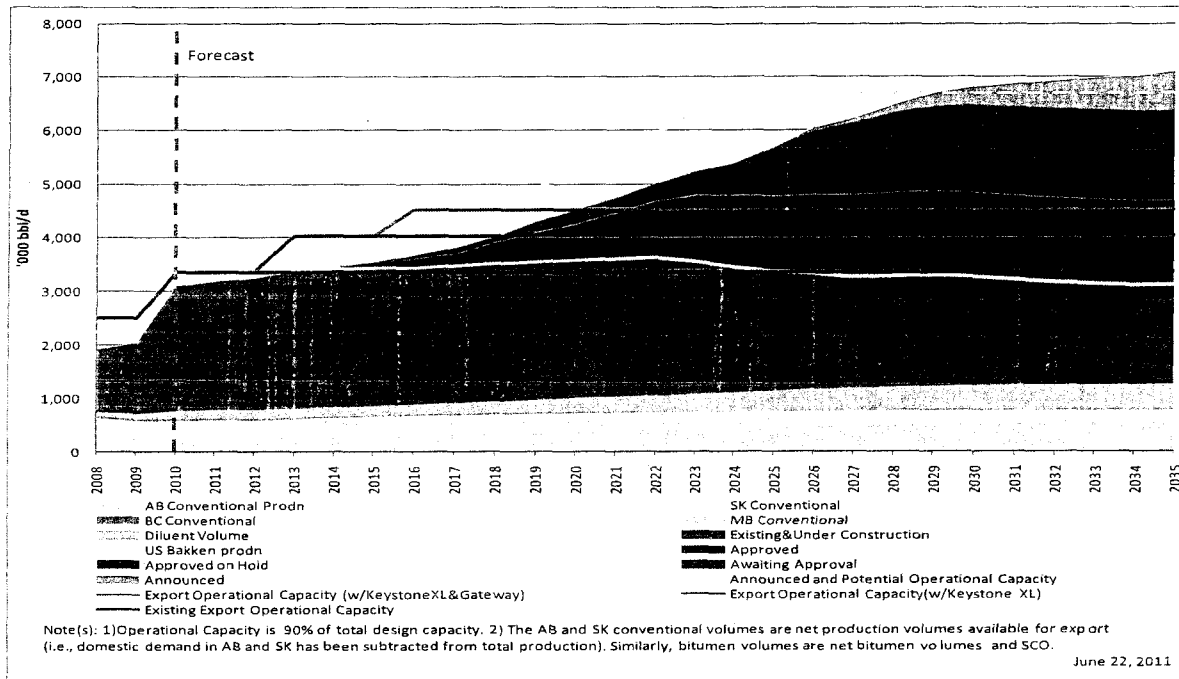
Figure 1.1 illustrates the historical and forecasted production levels from conventional crude sources in Western Canada. These include production volumes from conventional oil resources in Alberta and Saskatchewan, which are increasing at the beginning of the forecast period and levelling off in the latter part. The volumes out of British Columbia and Manitoba are also included; however, their production volumes are much smaller and may not be visible on the graph.

Figure 1.1 also includes Bakken production from the US. Since TransCanada has signed contracts with oil producers in the US² to carry crude from the US Bakken play via the Keystone XL pipeline, 65,000 BPD of US Bakken production is included. This is projected to increase to 100,000 BPD over the projection period. This crude is assumed to come on stream the year Keystone XL becomes operational.

¹For more information about the oil sands production forecasts and to download CERI Study 122, "Canadian Oil Sands Supply Costs and Development Projects (2010-2044)", see <http://ceri.ca/images/stories/CERI%20Study%20122.pdf>.

²The Bakken formation in the Williston Basin underlies parts of North Dakota, eastern Montana, and north western South Dakota. Current Bakken production is approximately 350,000 BPD, much of which is currently taken away by rail and truck.

Figure 1.1: Pipeline Capacity and Crude Exports



Source: CERL.

In addition, the graph presents historical and forecast volumes available for export from oil sands production. These are net bitumen and synthetic crude oil (SCO) volumes broken down by project status. The sudden jump in production from existing and under construction oil sands projects from 2009 to 2010 can be explained by an increase in production from four large mines belonging to Syncrude, Suncor, and CNRL. A large portion of bitumen and SCO volumes will come from the existing and under construction projects, with significant potential growth exhibited in projects that are approved, awaiting approval, and announced. Diluent volumes, calculated as a percentage of total oil sands production, are also included in this forecast. This analysis does not address any shortfall in diluent supply and assumes the industry will secure supply when necessary.

The three solid lines in Figure 1.1 represent export operational capacities – the red line being the current existing capacity, the blue representing Keystone XL, and the orange depicting the Northern Gateway pipeline. These three pipelines comprise the first three cases of this report. The announced and potential pipeline capacity for Case 4 is represented by the grey, dashed line.

This study is based on probabilities and delays. If the Keystone XL and the Northern Gateway pipelines are approved, several of the approved oil sands projects will advance construction schedules within the limits of labour and materials availability. In short, the feasibility of these oil sands projects is predicated on assured pipeline access to markets.

Case Analysis

This section provides a detailed overview of four cases. In each case, the pipeline capacity sets an upper bound limit on how much crude can be sent via the pipelines. It is assumed that conventional crude from British Columbia, Alberta, Saskatchewan, Manitoba, the US Bakken, and diluent volumes retain first place in the pipeline and, hence, might “push out” some volumes from oil sands production.

Case 1 – Existing Pipelines Operations

This case represents the existing export pipeline capacity out of Alberta, which is 3.5 MMBPD. If no other pipeline is built, the current capacity will be able to transport conventional production from Western Canada, diluent volumes, and exports from the oil sands projects that are currently on stream and a portion of under construction projects. The portion of under construction projects that will fill the existing pipelines is determined by the difference between Case 1 total production³ and the existing pipeline capacity. Here we do not explicitly judge individual projects from the under construction category that will be included in the existing pipeline capacity. The calculation is done at the aggregate industry level, where the projects are already summed accordingly, based on their project status. In fact, we assume one of two possibilities could occur: either some under construction projects will be halted or the entire supply side will be apportioned to pipeline capacity.

Case 1 omits the US Bakken production because crude from US Bakken will only come on stream when the Keystone XL pipeline’s capacity is added to the total existing capacity. The total crude volume that can be transported via the current pipelines is represented by the area under the red line in Figure 1.1. In other words, if no other pipeline is constructed, the oil sands projects that are above the red line will not get built because there will be no take-away capacity to move these crude volumes to markets. The projects affected include those categorized as approved, approved – on hold, awaiting approval, and announced.

Case 2 – Existing Pipelines Operations + TransCanada Keystone XL Pipeline

Case 2 differs from Case 1 by adding the capacity of the proposed Keystone XL pipeline, which is shown as a blue line in Figure 1.1. With US State Department approval of the project, Western Canada’s total pipeline capacity would expand by 700,000 BPD to 4.2 MMBPD in 2013. Case 2 includes all the crude volumes from Case 1. In addition, it takes into account US Bakken crude, oil sands under construction volumes that were not included in Case 1, and the portion of oil sands approved projects volumes that would fill Keystone XL to operational capacity. Similarly, as in Case 1, the portion of approved projects is determined by the difference between Case 2 production⁴ and the sum of existing pipeline capacity and Keystone XL. Again, the difference is calculated at the aggregate level, not on the individual project level.

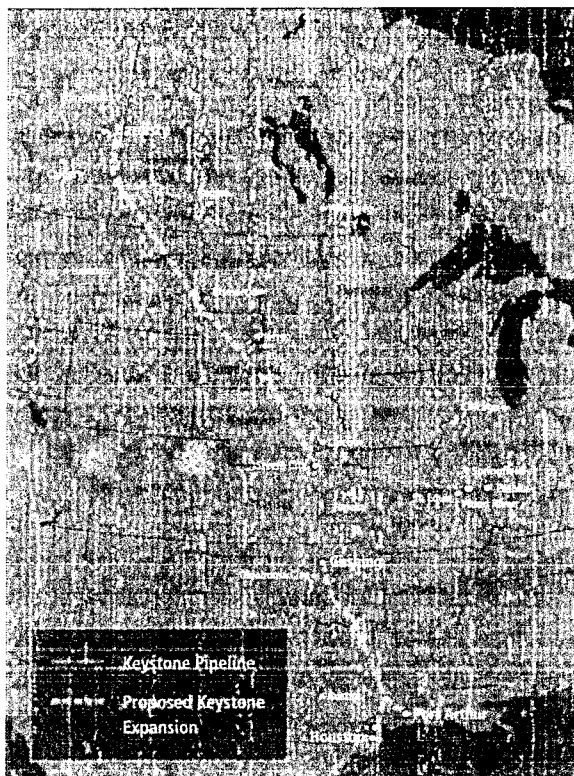
The Keystone Gulf Coast Expansion pipeline (Keystone XL) is a 36-inch crude oil pipeline that would begin at Hardisty, Alberta and extend southeast through Saskatchewan, Montana, South Dakota, Nebraska, Oklahoma, and Texas, as illustrated in Figure 1.2. The proposed pipeline would be built in two

³Case 1 production consists of Western Canadian conventional crude production, diluent, on stream and under construction projects.

⁴Case 2 production consists of Western Canadian conventional crude production, diluent, US Bakken, on stream, under construction and approved projects.

phases and have capacity to transport 700,000 BPD, delivering crude to the US Gulf Coast refineries.⁵ The pipeline could ultimately transport up to 900,000 BPD by increasing its pumping capacity.⁶

Figure 1.2: Keystone XL Pipeline Project



Source: TransCanada, Inc.

The total crude volume that can be transported via the existing pipelines and the Keystone XL is represented by the area under the blue line in Figure 1.1. The difference between the red and blue lines is the impact Keystone XL would have on oil sands projects. In other words, if Keystone XL comes on stream, the additional volumes that can be transported lie between the red and blue lines. The oil sands projects that are above the blue line would not get built because there would be no take-away capacity to move these crude volumes to markets.

Case 3 – Existing Pipelines Operations + TransCanada Keystone XL Pipeline + Northern Gateway Pipeline

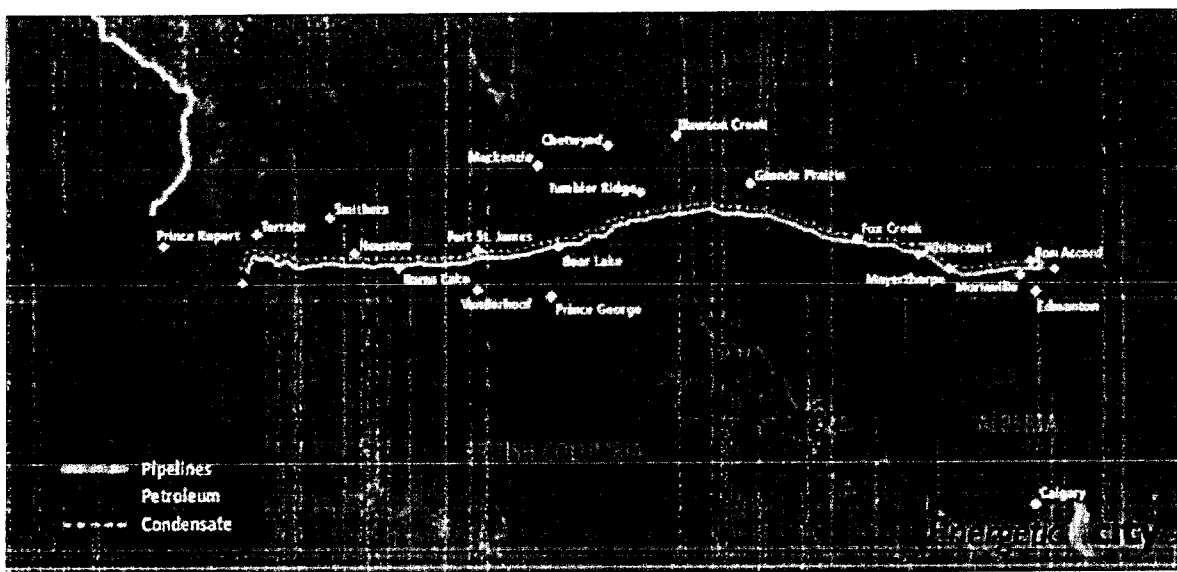
Case 3 sees the addition of the Northern Gateway pipeline, represented by the orange line in Figure 1.1, to already existing and Keystone XL capacities. The total pipeline capacity would then be expanded by 525,000 BPD in 2016 to almost 4.8 MMBPD. Case 3 includes all the crude volumes from Case 2; in addition, a portion of approved oil sands projects that lies between the blue and orange lines will be added to the total volume of crude that can be transported with inclusion of the Gateway pipeline. As with the two cases above, the portion of approved projects is calculated at the aggregate level.

⁵Congressional Research Service. "Keystone XL Pipeline Project: Key Issues". March 4, 2011.

⁶U.S. Department of State. "Draft Environmental Impact Statement for the Keystone XL Oil Pipeline Project". April 16, 2010.

The Enbridge Northern Gateway Pipelines Project is a proposal to construct two pipelines running from Bruderheim, Alberta to Kitimat, British Columbia – as shown in Figure 1.3. The eastbound pipeline would import natural gas condensate and the westbound pipeline would export crude oil. The crude oil pipeline, a 36-inch diameter line, would provide capacity of 525,000 BPD. The 20-inch condensate pipeline would run at a capacity of 193,000 BPD.

Figure 1.3: Northern Gateway Pipeline Project



Source: Enbridge

The total crude volume that can be transported via Keystone XL, Gateway, and all existing pipelines is represented by the area under the orange line in Figure 1.1. The difference between the blue and orange lines is the additional volumes from oil sands projects that can be transported to markets by Gateway. Cumulatively, if Keystone XL and Gateway become operational, the additional volumes that can be transported lie between the red and orange lines. The oil sands projects above the orange line will not get built because there will be no take-away capacity to move these crude volumes to markets.

Case 4 – Announced and Potential Capacity

This case is an if-you-come-they-will-build-it view of the potential growth in take-away pipeline capacity out of Western Canada. The grey, dashed line in Figure 1.1 represents the cumulative addition of all considered pipeline proposals. These pipelines are presented in Table 1.2.

Table 1.2: Announced and Potential Export Pipelines

Name	Type	Capacity ('000 b/d)	Destination
Kinder Morgan			
TMX2	Crude oil &RPPs	80	US West coast/Offshore/Far East
TMX3		320	
TMX Northern leg expansion	Crude oil &RPPs	400	British Columbia/US West coast/Far East
TCPL Keystone XL expansion	Crude oil	200	US Gulf Coast
Gas Transmission Northwest (GTN) conversion	Crude oil	500	US West coast/Offshore/Far East
Enbridge Southern Access Extension 1	Crude oil	400	US Gulf Coast
Enbridge Southern Access Extension 2	Crude oil	400	US Gulf Coast
Total		2,300	

Source: CAPP, CERl.

Some of these projects are more likely to come to fruition than others. For example, Kinder Morgan's TMX2, TMX3 and TMX Northern leg expansion are closer to being operational than the Enbridge Southern Access Extension. The conversion of one of the two gas pipelines to oil for Gas Transmission Northwest has only been mentioned a few times, but the Keystone XL expansion would only require increased pumping to bring total capacity up to 900,000 BPD.

If and/or when these pipelines become operational, they can add another 2.3 MMBPD by 2024 for a total export operational capacity approaching 7 MMBPD. The total crude volume that can be transported via this pipeline capacity is represented by the area under the grey, dashed line in Figure 1.1. Even with a significant increase to the take-away capacity, there remains a possibility that not all oil sands projects will be built. The portion that will be left out is above the grey line and represents projects from the announced category. The difference between the orange and grey lines is the additional volumes from oil sands projects that can be transported to markets by adding the announced and potential pipelines.

Methodology

Among the four cases, we recognize that the Keystone XL pipeline, the Northern Gateway pipeline, and the Announced and Potential Export Pipelines are intended to transport bitumen and SCO to different market destinations. More specifically, the Keystone XL and the Announced & Potential Export Pipelines would transport bitumen and SCO to the US market, while the Northern Gateway pipeline would provide transportation to the Pacific Ocean and the international oil market. In order to differentiate the economic impacts of the Alberta oil sands industry on the US and international markets, we have employed CERI's proprietary US-Canada Multi-Regional I/O Model (*UCMRIO 2.0*). We expect that the projects which deliver bitumen and SCO to the US will create stronger energy ties between Canada and the US. These stronger future energy ties, which will elevate the energy trade between the two countries, are not captured in the I/O tables.

The first case under discussion in this report, Existing Pipeline Operations, is based on the existing trade pattern between the US and Canada. CERI employs the *Reference Case* scenario of the above-mentioned I/O model to evaluate the economic impact of Alberta's existing oil sands projects on the US and Canadian economies.

As the Keystone XL Pipeline project has not yet received final State Department approval, judging its impact on North American crude transportation involves speculation on future developments. We therefore utilize a *Plausible Scenario* (see CERI Study 124⁷ for more information on this scenario) to forecast economic impacts and how the US-Canada trade pattern could be affected.

The Northern Gateway Pipeline project, also not yet approved, would not have as profound an effect as Keystone XL on the US-Canada trade pattern because the entire pipeline would be located within Canada – crude would ship to a Canadian port for delivery to various international destinations, possibly including or not including the US. For these reasons, we return to the *Reference Case* scenario to analyze economic impacts expected with an operational Gateway pipeline.

Finally, this report analyzes the effects of all oil sands projects and the required transportation capacity to move the produced product. In this case, the destination of much of the crude will be US refineries. Therefore, there would be considerable implications for the US-Canada trade pattern; the *Plausible Scenario* is the economic tool used to measure impacts under this situation.

⁷"Economic Impacts of New Oil Sands Projects in Alberta (2010-2035), May 2011.
<http://ceri.ca/images/stories/CERI%20Study%20124.pdf>

Results

This section describes the economic impacts of oil sands projects – both existing and new – over the period 2010-2035. The impacts are calculated both for Canada and the US, with Canadian impacts examined at the provincial level and US impacts broken down to PADD and state levels. The impacts under consideration are Gross Domestic Product (GDP), employee compensation, and employment; tax and royalty implications are also considered. The economic impacts associated with investment and operation of pipelines are outside the scope of this study.

Case 1 – Existing Pipelines Operations

This case examines the economic impacts of existing oil sands operations and those that are still under construction. It assumes no new pipeline capacity. The findings of this section serve as a baseline, relative to which the impacts of more expansive scenarios are to be compared.

Canadian Impacts

Cash injections into the oil sands industry over the next 25 years are estimated to be \$2,190 billion and consist of the following:

- a) investment outlays for projects currently under construction prior to commencing production, plus the gross value of their marketable bitumen and synthetic crude oil output over this period, plus
- b) “sustaining investment” outlays over the projects’ operating lives up to 2035 that are required to replace the worn out capital.

The cumulative sum of additional Canadian GDP from 2010 to 2035, as a result of the continued operation of existing projects and projects under construction is estimated at \$2,283 billion (see Table 1.3). Employment in Canada (direct, indirect, and induced) is expected to grow from 390,000 jobs to a peak of 490,000 jobs in 2020 (Figure 1.4). Direct employment in Alberta is estimated at 132,000 jobs at the beginning of the study period, reaching a peak of 163,000 jobs in 2019. Compensation of Canadian employees will reach a cumulative total of \$650 billion by 2035.

Table 1.4 further categorizes the person-years of employment into direct, indirect, and induced impacts. For every province except Alberta, the induced impact is the largest of all economic impact types. Alberta, however, captures the entire direct impact, and the induced impact is smaller than either the direct or the indirect impact within that province.

Figure 1.4 depicts the national pattern of employment creation and preservation in each year over the 25 year time frame of the study. The maximum employment impact occurs in the years 2017 to 2019.

Table 1.3: Economic Impact of Oil Sands in Alberta, 2010-2035 – Case 1
Investments and Operations

Investments and Operations	SCAD Million		Thousand Person Years
	GDP	Compensation of Employees	Employment
Alberta	2,165,038	581,607	10,372
British Columbia	28,776	15,886	426
Manitoba	4,323	2,341	67
New Brunswick	838	413	12
Newfoundland & Labrador	369	133	4
Northwest Territories	151	73	2
Nova Scotia	857	439	12
Nunavut	30	18	0
Ontario	64,888	37,283	882
Prince Edward Island	65	35	1
Quebec	14,066	7,842	211
Saskatchewan	4,525	1,964	55
Yukon Territory	40	25	1
Total Canada	2,283,966	648,059	12,046

Table 1.4: Jobs as a Result of Oil Sands Projects in Alberta, 2010-2035 – Case 1
Investments and Operations

	Direct	Indirect	Induced
Alberta	100.0%	82.3%	76.1%
British Columbia	0.0%	4.3%	6.3%
Manitoba	0.0%	0.7%	0.9%
New Brunswick	0.0%	0.1%	0.2%
Newfoundland & Labrador	0.0%	0.0%	0.1%
Northwest Territories	0.0%	0.0%	0.0%
Nova Scotia	0.0%	0.1%	0.2%
Nunavut	0.0%	0.0%	0.0%
Ontario	0.0%	9.6%	12.4%
Prince Edward Island	0.0%	0.0%	0.0%
Quebec	0.0%	2.1%	3.1%
Saskatchewan	0.0%	0.6%	0.7%
Yukon Territory	0.0%	0.0%	0.0%
SUM	100.0%	100.0%	100.0%

Figure 1.4: Jobs (x 1,000) Created and Preserved in Canada, 2010-2035 – Case 1

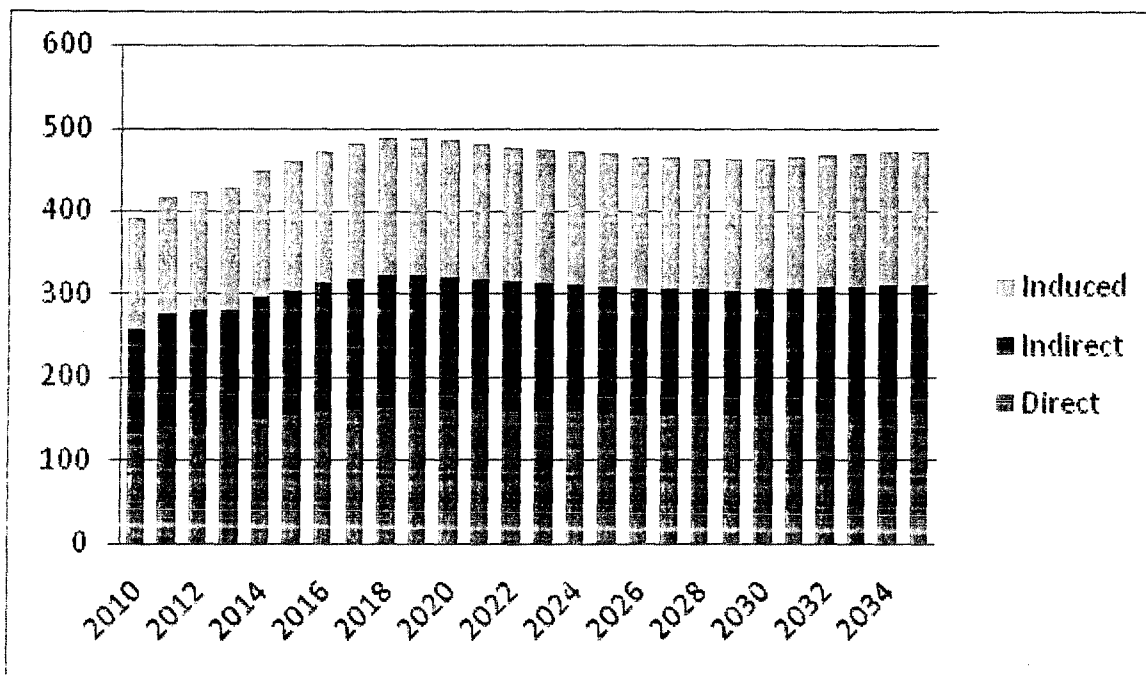


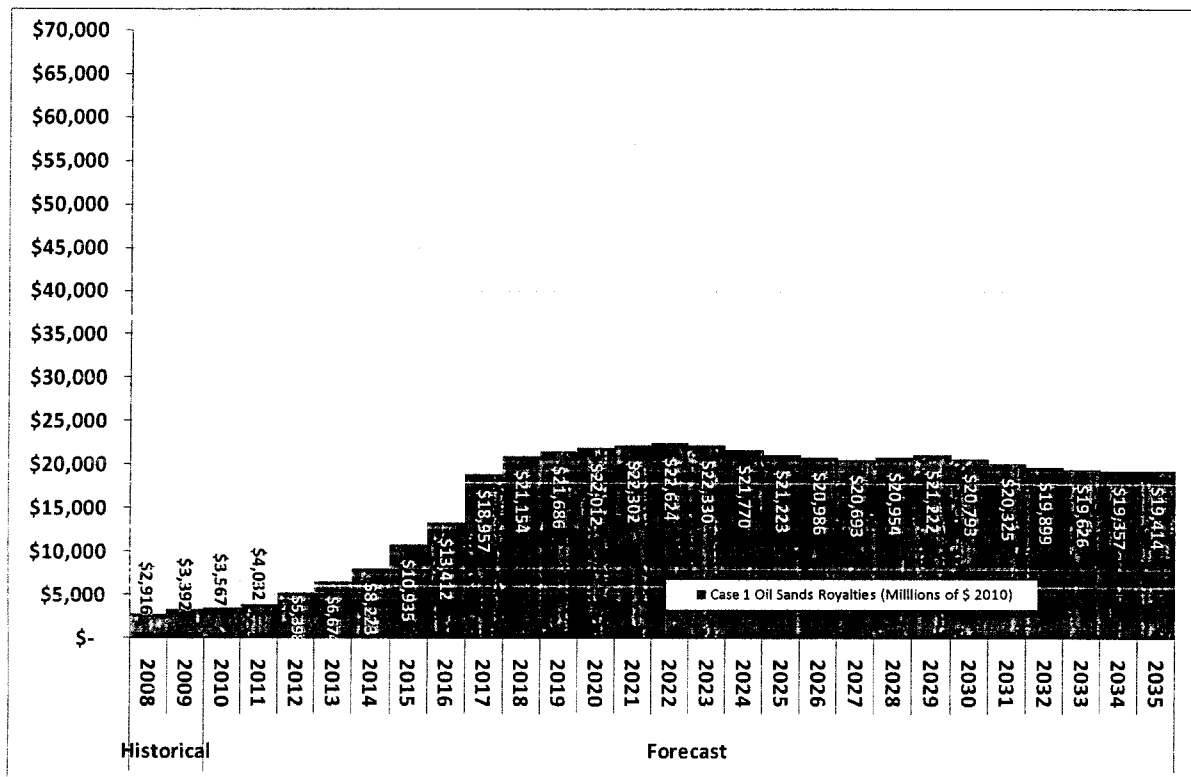
Table 1.5 summarizes the tax impacts by type of tax and by taxpayer's province. Note that in this format federal, provincial, and municipal taxes are shown together. Once again, Alberta leads the pack, followed by Ontario and British Columbia. Not shown in Table 1.5 are total royalties over the 25-year period of \$450 billion, all payable to the Alberta government; those royalties are broken down year by year in Figure 1.5.

Table 1.5: Tax Receipts as a Result of Alberta Oil Sands Investments and Operations,
2010-2035 – Case 1
Federal and Provincial-Municipal

Province/Territory	Indirect Tax	Personal Income Tax	Corporate Tax	Sum
Alberta	134249	206684	102024	442956
British Columbia	3808	3140	711	7660
Manitoba	657	473	77	1208
New Brunswick	119	91	20	230
Newfoundland & Labrador	37	27	13	77
Northwest Territories	14	8	8	29
Nova Scotia	137	106	26	270
Nunavut	2	2	0	4
Ontario	10343	7748	3216	21308
Prince Edward Island	11	8	1	20
Quebec	2602	2028	589	5219
Saskatchewan	738	418	255	1412
Yukon Territory	4	3	0	7

Royalties increase over the 2010-2022 time frame as a direct result of the increase in real oil price and the increase in royalty rates as a result of individual projects advancing from pre- to post-payout condition. After 2022, royalties remain flat as a result of declining production from older existing projects, even though real oil prices continue to increase.

Figure 1.5: Royalties Paid to the Alberta Government – Case 1



US Impacts

Total cumulative GDP impact in the US for Case 1 as a result of continued operation of existing oil sands projects and projects under construction is estimated to be CAD\$210 billion over the 25-year projection period, approximately 10 percent of the total GDP generated in Canada. Total employment in the US is projected to grow from 80,000 jobs created and preserved to a peak of 94,000 jobs created and preserved in 2019. Cumulative compensation of employees in the US will reach CAD \$100 billion by the end of the study period in 2035.

The total economic impacts on the US by PADD are presented in Table 1.6. Although these aggregate impacts are lower than those for Alberta, they are higher than all other provinces and territories combined. Table 1.7 shows the total economic impacts in the US on a state level for Case 1.

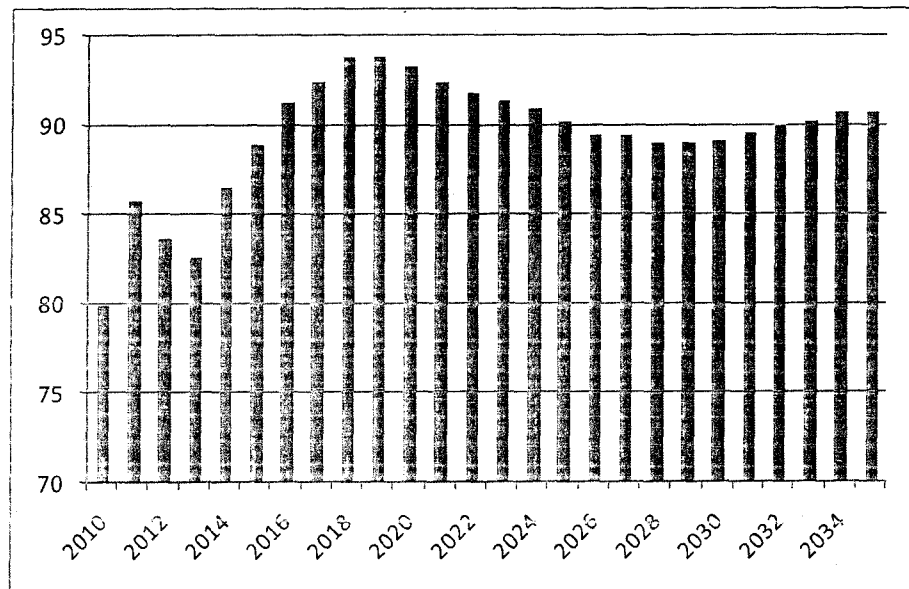
Table 1.6: Total Economic Impact of Alberta Oil Sands by US PADD – Case 1

2010-2035	SCAD Million		Thousand Person Years
	GDP	Compensation of Employees	Employment
PADD I	56,907	28,805	657
PADD II	75,972	37,523	868
PADD III	29,398	11,579	289
PADD IV	12,167	5,670	133
PADD V	36,088	16,827	381
Total US	210,531	100,403	2,328

Table 1.7: Total Economic Impact of Alberta Oil Sands in US by State, 2010-2035 – Case 1

	SCAD: Million		Thousand
	GDP	Compensation of Employees	Person Years
Alabama	1,890	948	28
Alaska	772	168	4
Arizona	2,533	1,243	33
Arkansas	1,107	521	17
California	22,155	10,292	221
Colorado	4,978	2,354	53
Connecticut	2,499	1,231	22
Delaware	700	260	6
District of Columbia	701	431	6
Florida	7,558	3,674	102
Georgia	4,158	2,165	56
Hawaii	585	268	8
Idaho	548	281	9
Illinois	26,437	12,886	264
Indiana	3,573	1,777	44
Iowa	1,563	686	21
Kansas	3,042	1,479	35
Kentucky	1,778	877	26
Louisiana	5,230	1,679	40
Maine	499	262	9
Maryland	2,557	1,315	31
Massachusetts	3,751	2,141	42
Michigan	6,618	3,510	80
Minnesota	3,000	1,559	38
Mississippi	1,123	541	17
Missouri	2,533	1,347	37
Montana	4,916	2,327	50
Nebraska	870	411	12
Nevada	1,333	639	17
New Hampshire	625	347	9
New Jersey	5,225	2,654	52
New Mexico	894	313	10
New York	11,342	5,739	104
North Carolina	4,568	2,031	54
North Dakota	305	129	5
Ohio	9,982	5,028	116
Oklahoma	2,011	817	24
Oregon	1,982	932	25
Pennsylvania	5,958	3,081	74
Rhode Island	495	243	6
South Carolina	1,637	881	26
South Dakota	369	143	6
Tennessee	2,729	1,398	40
Texas	19,153	7,577	177
Utah	1,157	561	16
Vermont	252	131	4
Virginia	3,789	1,930	45
Washington	6,727	3,284	72
West Virginia	591	287	9
Wisconsin	11,164	5,478	120
Wyoming	567	146	4
Total US	210,531	100,403	2328

Figure 1.6: Total Jobs (x 1,000) Created and Preserved in the US, 2010-2035 – Case 1



Case 2 – Existing Pipelines Operations + TransCanada Keystone XL Pipeline

This case considers the economic impacts of existing oil sands operations and those currently under construction. It assumes the Keystone XL pipeline comes on stream in 2013 and that a portion of approved oil sands projects not yet under construction will in fact become operational. The difference between the impacts of Case 1 and Case 2, therefore, is a measure of the impacts attributable to constructing and operating a portion of approved oil sands projects that require the capacity of the Keystone XL pipeline to deliver their output to market.

Canadian Impacts

Cumulative cash injections into the oil sands industry over the next 25 years for Case 2 are estimated to be \$2,821 billion. The cumulative sum of additional Canadian GDP from 2010 to 2035, as a result of the continued operation of existing projects and projects under construction, and the development of new projects to support the Keystone XL pipeline is estimated at \$2,916 billion (see Table 1.8). Employment in Canada (direct, indirect, and induced) is expected to grow from 390,000 jobs to a peak of 690,000 jobs in 2019 (Figure 1.7). Direct employment in Alberta is estimated at 132,000 jobs at the beginning of the study period, peaking at 229,000 jobs by 2019. Compensation of Canadian employees will reach a cumulative total of \$834 billion by 2035.

Table 1.9 further categorizes the person-years of employment into direct, indirect, and induced impacts. For every province except Alberta, the induced impact is the largest of all economic impact types. Alberta, however, captures the entire direct impact, and the induced impact is smaller than either the direct or the indirect impact within that province.

Figure 1.7 depicts the national pattern of employment creation and preservation in each year over the 25-year time frame of the study. The maximum employment impact occurs in the year 2019.

Table 1.8: Economic Impact of Oil Sands in Alberta, 2010-2035 – Case 2
Investments and Operations

Investments and Operations	\$CAD Million		Thousand Person Years
	GDP	Compensation of Employees	Employment
Alberta	2,761,936	748,617	13,394
British Columbia	37,363	20,622	553
Manitoba	5,659	3,062	88
New Brunswick	1,093	538	16
Newfoundland & Labrador	480	172	5
Northwest Territories	196	96	2
Nova Scotia	1,115	572	16
Nunavut	38	23	1
Ontario	83,830	48,202	1,141
Prince Edward Island	84	46	1
Quebec	18,238	10,176	274
Saskatchewan	5,997	2,602	72
Yukon Territory	52	32	1
Total Canada	2,916,081	834,759	15,563

Impacts, in terms of employment created and preserved, are shown in Table 1.9 by province and by the categories of direct, indirect, and induced employment. As in Case 1, the induced impact in each province except Alberta equals or exceeds the indirect impact, whereas in Alberta direct impact is greatest, followed by indirect impact and induced impact.

Table 1.9: Jobs as a Result of Oil Sands Projects in Alberta, 2010-2035 – Case 2
Investments and Operations

Thousand Person Years	Direct	Indirect	Induced
Alberta	100.0%	82.2%	76.0%
British Columbia	0.0%	4.4%	6.3%
Manitoba	0.0%	0.7%	1.0%
New Brunswick	0.0%	0.1%	0.2%
Newfoundland & Labrador	0.0%	0.0%	0.1%
Northwest Territories	0.0%	0.0%	0.0%
Nova Scotia	0.0%	0.1%	0.2%
Nunavut	0.0%	0.0%	0.0%
Ontario	0.0%	9.6%	12.4%
Prince Edward Island	0.0%	0.0%	0.0%
Quebec	0.0%	2.2%	3.1%
Saskatchewan	0.0%	0.6%	0.8%
Yukon Territory	0.0%	0.0%	0.0%
SUM	100.0%	100.0%	100.0%

Figure 1.7 portrays Case 2 employment impacts by year, classified by direct, indirect, and induced impacts. Employment impact reaches a plateau in 2018- 2019.

Figure 1.7: Jobs (x 1,000) Created and Preserved in Canada, 2010-2035 – Case 2

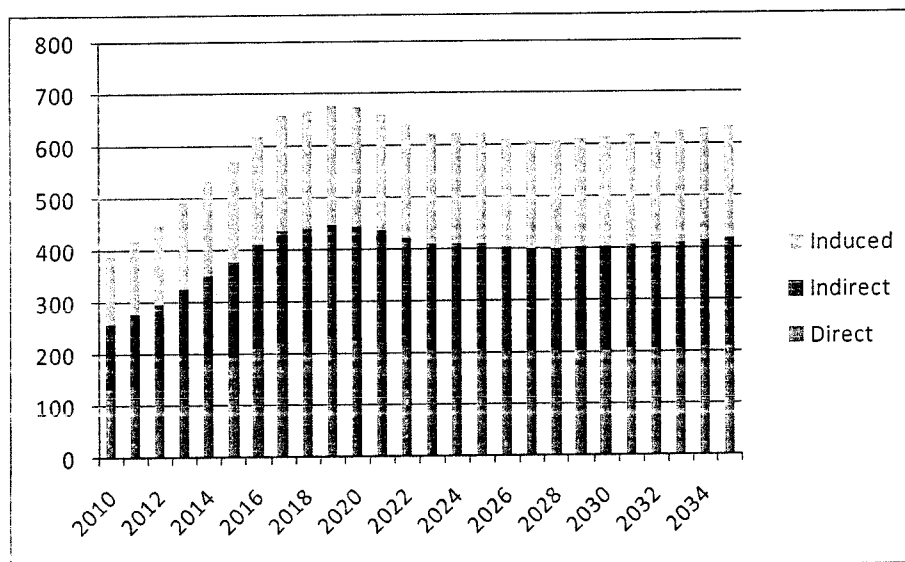
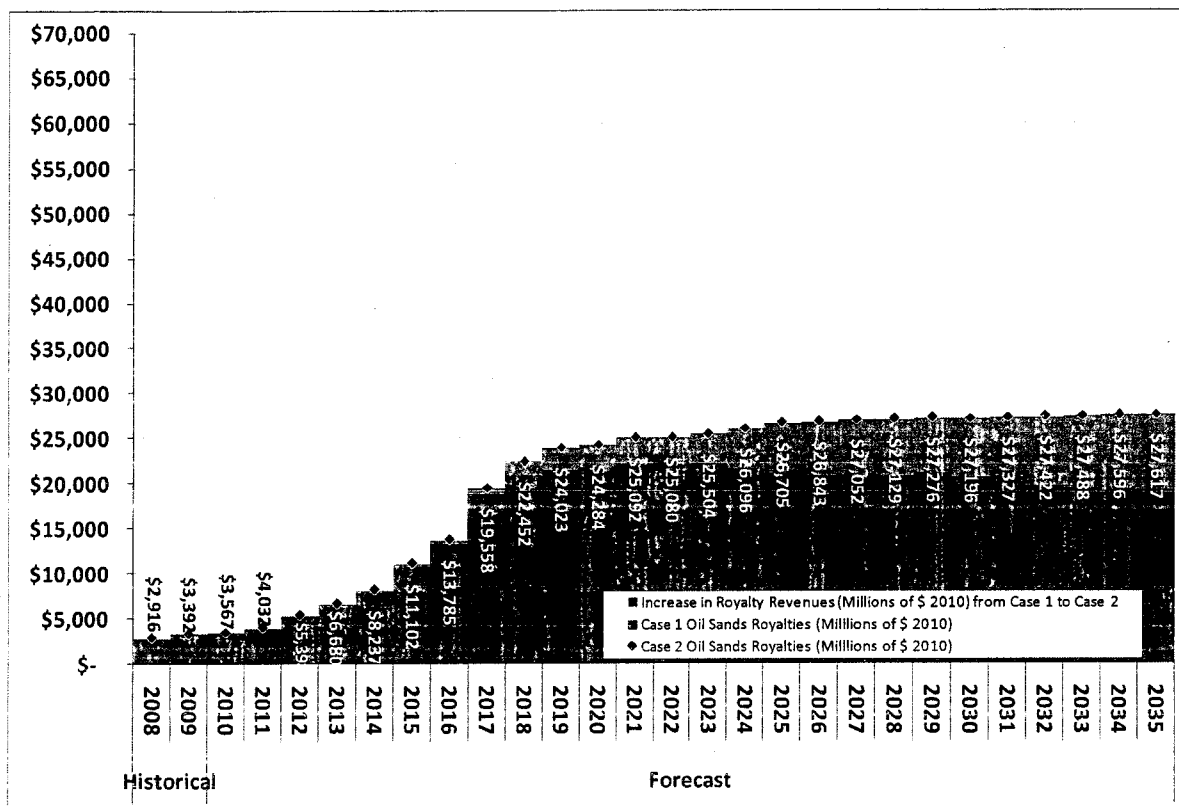


Table 1.10 summarizes the tax impacts by type of tax and by taxpayer's province. By far, Alberta collects the most revenue through tax, followed by Ontario and British Columbia. Figure 1.8 shows the annual royalties paid over the 25-year period which has a cumulative total of \$551 billion, all payable to the Alberta government.

Table 1.10: Tax Receipts as a Result of Alberta Oil Sands Investments and Operations,
2010-2035 – Case 2
Federal and Provincial-Municipal

Province/Territory	Indirect Tax	Personal Income Tax	Corporate Tax	Sum
Alberta	171,400	263,666	130,151	565,218
British Columbia	4,943	4,077	924	9,944
Manitoba	861	620	101	1,582
New Brunswick	155	118	26	300
Newfoundland & Labrador	49	35	17	101
Northwest Territories	18	10	10	38
Nova Scotia	179	138	34	351
Nunavut	2	3	1	6
Ontario	13,341	10,010	4,155	27,506
Prince Edward Island	15	10	2	27
Quebec	3,366	2,629	763	6,759
Saskatchewan	990	554	338	1,883
Yukon Territory	5	4	0	9

Figure 1.8: Royalties Paid to the Alberta Government – Case 1 + Case 2



US Impacts

Total cumulative GDP impact in the US for Case 2 as a result of continued operation of oil sands projects is estimated to be CAD\$359 billion over the 25-year projection period, approximately 10 percent of the total GDP generated in Canada. Total employment in the US is projected to grow from 80,000 jobs created and preserved at the beginning of the study period to a peak of 179,000 jobs created and preserves in the year 2019. Compensation of employees in the US will reach a cumulative total of CAD\$171 billion by the end of the study period in 2035.

As shown in Table 1.11, the greatest US impacts – in all three categories – are felt in PADD II, the Midwest region, which is the leading importer of Canadian liquid hydrocarbons. Table 1.12 shows the economic impacts on the US by state for Case 2.

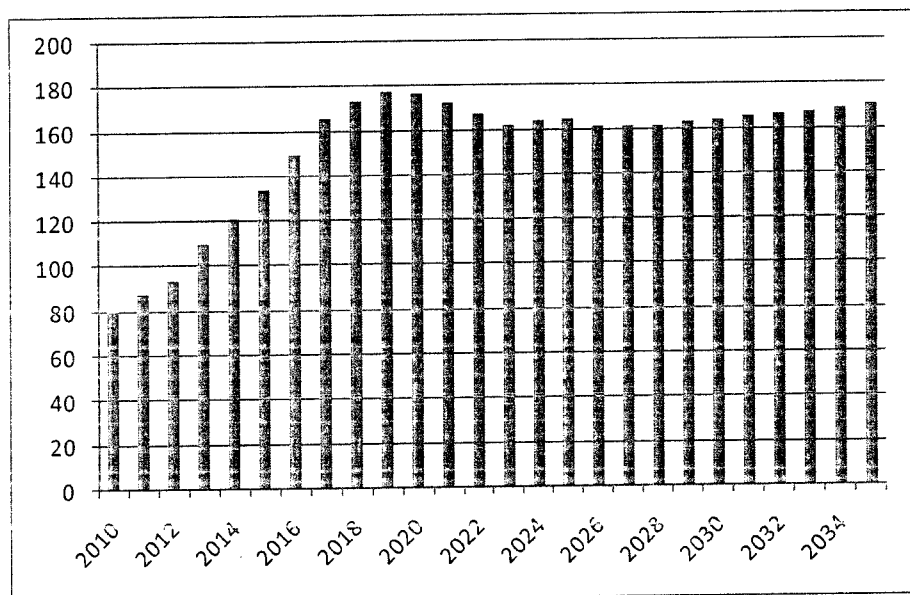
Table 1.11: Total Economic Impact of Alberta Oil Sands by US PADD – Case 2

2010-2035	\$CAD Million		Thousand Person
	GDP	Compensation of Employees	Years Employment
PADD I	98,832	49,977	1,135
PADD II	127,285	62,893	1,458
PADD III	50,601	19,919	495
PADD IV	19,932	9,276	219
PADD V	62,517	29,151	657
Total US	359,167	171,216	3,965

Table 1.12: Total Economic Impact of Alberta Oil Sands in US by State, 2010-2035 – Case 2

	SCAD: Million		Thousand Person Years
	GDP	Compensation of Employees	Employment
Alabama	3,340	1,672	48
Alaska	1,319	285	7
Arizona	4,441	2,179	57
Arkansas	1,938	911	29
California	38,698	17,983	385
Colorado	8,245	3,897	88
Connecticut	4,362	2,147	39
Delaware	1,196	445	9
District of Columbia	1,190	733	11
Florida	13,049	6,343	175
Georgia	7,195	3,743	96
Hawaii	992	454	14
Idaho	992	505	17
Illinois	42,685	20,831	427
Indiana	6,401	3,175	78
Iowa	2,797	1,231	37
Kansas	4,994	2,429	59
Kentucky	3,156	1,553	45
Louisiana	8,784	2,784	67
Maine	866	455	15
Maryland	4,431	2,277	54
Massachusetts	6,618	3,757	73
Michigan	11,501	6,089	138
Minnesota	5,272	2,733	66
Mississippi	1,948	939	30
Missouri	4,437	2,352	65
Montana	7,717	3,651	79
Nebraska	1,524	719	22
Nevada	2,265	1,086	29
New Hampshire	1,121	619	15
New Jersey	8,990	4,567	89
New Mexico	1,568	552	17
New York	19,572	9,896	180
North Carolina	8,062	3,590	94
North Dakota	544	231	8
Ohio	16,859	8,495	195
Oklahoma	3,523	1,434	42
Oregon	3,738	1,757	47
Pennsylvania	10,402	5,368	129
Rhode Island	858	422	11
South Carolina	2,904	1,557	46
South Dakota	652	256	10
Tennessee	4,859	2,482	70
Texas	33,024	13,061	304
Utah	2,013	976	28
Vermont	446	231	7
Virginia	6,547	3,333	78
Washington	11,064	5,406	119
West Virginia	1,023	496	15
Wisconsin	18,082	8,886	195
Wyoming	965	247	7
Total US	359,167	171,216	3,965

Figure 1.9: Total Jobs (x 1,000) Created and Preserved in the US, 2010-2035 – Case 2



Lost Growth if Keystone XL Pipeline Project Cancelled

In 2011, Western Canada's total pipeline export capacity stands at 3.5 MMBPD. The addition of the Keystone XL Pipeline would grow the export capacity by 700,000 BPD. Substantial GDP and employment increases would then follow throughout North America. However, if the project does not go ahead, Canada would forego \$632 billion in additional GDP over the next 25 years, with 94 percent of the loss being felt in Alberta. The US would forego \$148 billion in GDP, with 34 percent lost to PADD II, 28 percent lost to PADD I, 18 percent lost to PADD V, 14 percent lost to PADD III, and 5 percent lost to PADD IV.

In terms of employment, over the 25-year period, Canada would lose out on a total of 3.5 million person years of employment creation. Alberta would stand to lose the most because the vast majority of created employment would be within the province; more than 86 percent of foregone Canadian employment would be lost within Alberta. Ontario would lose 7 percent, followed by British Columbia with 3.5 percent.

The US total of lost employment would be 1.6 million person years. PADD II would lose 36 percent of that total, followed by PADD I (29 percent), PADD V (17 percent), PADD III (13 percent), and PADD IV (5 percent).

In terms of uncollected federal, provincial, and municipal tax revenues in the event of the cancellation of Keystone XL, the most would be from Alberta – more than \$122 billion in foregone tax collections, 92 percent of the total. Not surprising, considering that the majority of oil sands related employment occurs within Alberta, personal income tax would be most affected, with almost half of foregone revenues arising from that category. Indirect taxes make up a greater proportion of the total in other jurisdictions. Royalties foregone to the Government of Alberta would total \$95 billion.

Case 3 – Existing Pipelines Operations + TransCanada Keystone XL Pipeline + Enbridge Northern Gateway Pipeline

Case 3 includes all of the projects considered in Case 2 and adds an additional portion of approved projects that can be accommodated by the Northern Gateway pipeline in operation by 2016. The difference between the impacts of Case 2 and Case 3, therefore, is a measure of the impacts attributable to constructing and operating the oil sands projects that would require the capacity of the Northern Gateway pipeline in order to deliver output to market.

Canadian Impacts

Cumulative cash injections into the oil sands industry over the next 25 years for Case 3 are estimated to be \$3,208 billion. The cumulative sum of additional GDP from 2010 to 2035 as a result of the continued operation of existing projects, the start up of projects under construction, and the development of new projects to support the Keystone XL and Gateway pipelines is estimated at \$3,317 billion (see Table 1.13). Employment in Canada (direct, indirect, and induced) is expected to grow from 390,000 jobs to a peak of 790,000 jobs in 2020 (Figure 1.10). Direct employment in Alberta is estimated at 132,000 jobs at the beginning of the study period, peaking at 268,000 in 2020. Direct employment includes people working at the individual oil sands sites and people working in the manufacturing industries that build products specifically required for the operation of these projects. Compensation of Canadian employees will reach a cumulative total of close to \$950 billion by 2035.

The economic impacts presented for Case 3 are uniformly larger than for Case 2 (see Tables 1.14-1.16 and Figure 1.10). It should be noted that employment peaks in 2020, and nears that peak again by the last year under consideration in this study (see Figure 1.10). It is also notable that Table 4.3 does not report royalty revenue paid to the Government of Alberta, a total of \$618 billion over the 25-year projection period; royalties are broken down by year in Figure 1.11.

Table 1.13: Economic Impact of Oil Sands in Alberta, 2010-2035 – Case 3
Investments and Operations

Investments and Operation	SCAD Million		Thousand Person Years
	GDP	Compensation of Employees	Employment
Alberta	3,142,308	851,065	15,222
British Columbia	42,446	23,428	628
Manitoba	6,425	3,477	100
New Brunswick	1,241	611	18
Newfoundland & Labrador	545	195	5
Northwest Territories	223	109	3
Nova Scotia	1,267	649	18
Nunavut	44	26	1
Ontario	95,274	54,779	1,296
Prince Edward Island	95	52	2
Quebec	20,721	11,561	311
Saskatchewan	6,802	2,951	82
Yukon Territory	59	37	1
Total Canada	3,317,449	948,939	17,687

Table 1.14: Jobs as a Result of New Oil Sands Projects in Alberta, 2010-2035 – Case 3
Investments and Operations

Thousand Person	Direct	Indirect	Induced
Alberta	100.0%	82.2%	76.0%
British Columbia	0.0%	4.4%	6.3%
Manitoba	0.0%	0.7%	1.0%
New Brunswick	0.0%	0.1%	0.2%
Newfoundland & Labrador	0.0%	0.0%	0.1%
Northwest Territories	0.0%	0.0%	0.0%
Nova Scotia	0.0%	0.1%	0.2%
Nunavut	0.0%	0.0%	0.0%
Ontario	0.0%	9.6%	12.4%
Prince Edward Island	0.0%	0.0%	0.0%
Quebec	0.0%	2.2%	3.1%
Saskatchewan	0.0%	0.6%	0.8%
Yukon Territory	0.0%	0.0%	0.0%
SUM	100.0%	100.0%	100.0%

Figure 1.10: Jobs (x 1,000) Created and Preserved in Canada, 2010-2035 – Case 3

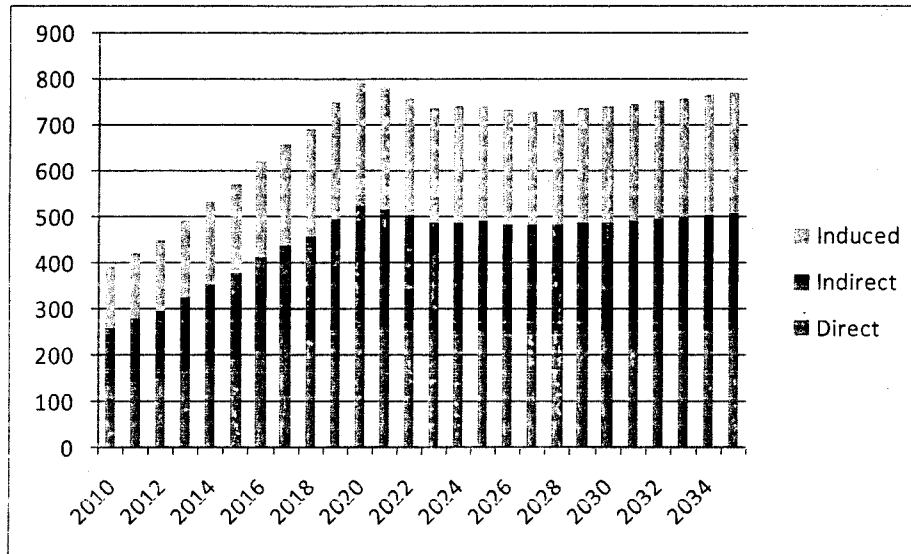
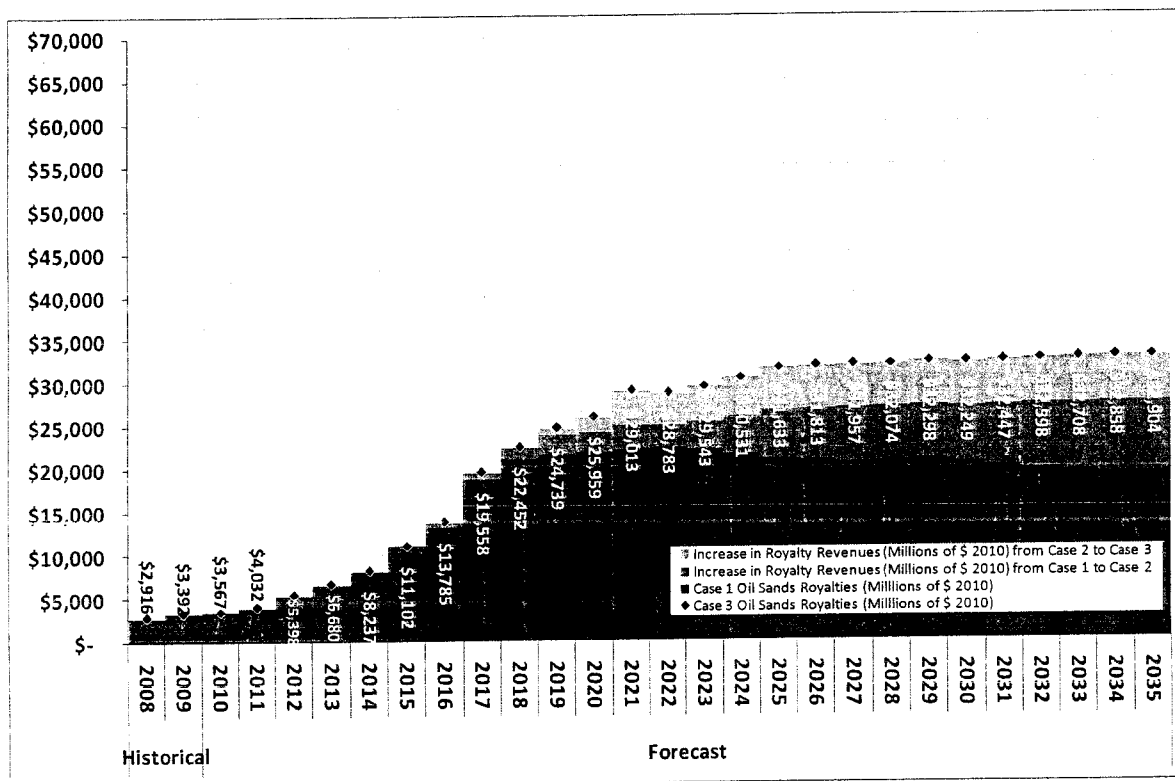


Table 1.15: Tax Receipts as a Result of Alberta Oil Sands Investments and Operations,
2010-2035 – Case 3
Federal and Provincial-Municipal

Province/Territory	Indirect Tax	Personal Income Tax	Corporate Tax	Sum
Alberta	194,994	299,978	148,076	643,048
British Columbia	5,616	4,632	1,049	11,297
Manitoba	977	703	115	1,796
New Brunswick	176	134	29	340
Newfoundland & Labrador	55	40	19	114
Northwest Territories	20	12	11	43
Nova Scotia	203	157	39	398
Nunavut	3	3	1	6
Ontario	15,164	11,377	4,722	31,263
Prince Edward Island	17	11	2	30
Quebec	3,825	2,987	867	7,680
Saskatchewan	1,122	629	383	2,135
Yukon Territory	5	5	0	11

Figure 1.11: Royalties Paid to the Alberta Government – Case 1 + Case 2 + Case 3



US Impacts

Total cumulative GDP impact in the US for Case 3 as a result of continued operation of oil sands projects is estimated to be CAD\$397 billion over the 25-year projection period. Total employment in the US is projected to grow from 80,000 jobs created and preserved to a peak of 200,000 jobs created and preserved in 2020. Cumulative compensation of employees in the US will reach CAD\$189 billion by the end of the study period in 2035.

US GDP and employment figures are not affected as significantly for Case 3 as they are for Case 2 because the Gateway pipeline will ship crude primarily to destinations outside of North America. It will not, therefore, affect the US economy as profoundly as the Keystone XL which will transport the crude directly into the United States and its refineries along the Gulf coast.

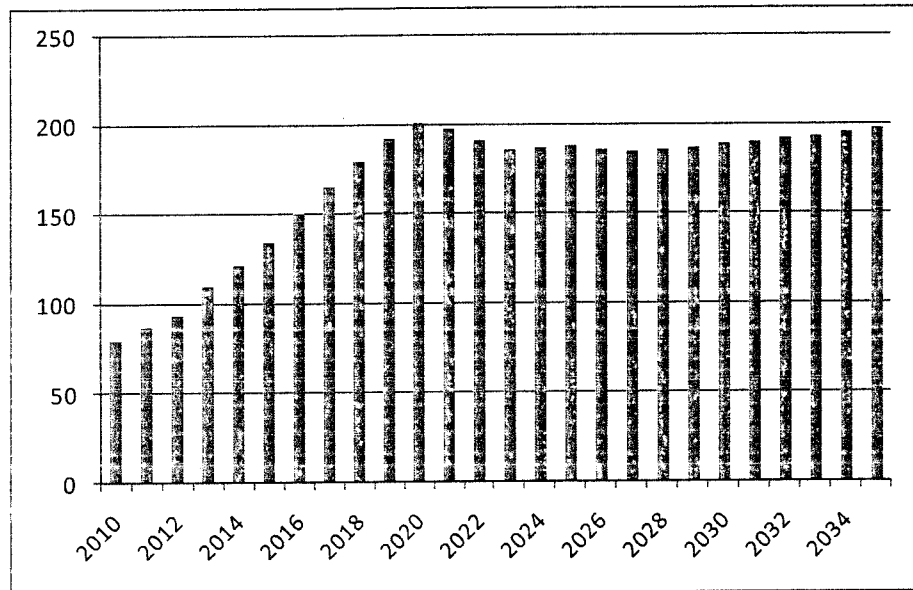
Table 1.16 shows that the greatest US impacts – in all three categories – are felt in PADD II. Table 1.17 shows the economic impacts on the US by state for Case 3.

Table 1.16: Total Economic Impact of Alberta Oil Sands by US PADD – Case 3

2010-2035	SCAD Million		Thousand
	GDP	Compensation of Employees	Person Years Employment
PADD I	108,949	55,098	1,252
PADD II	140,716	69,527	1,611
PADD III	55,820	21,974	547
PADD IV	22,075	10,275	243
PADD V	68,930	32,141	725
Total US	396,491	189,016	4,378

Table 1.17: Total Economic Impact of Alberta Oil Sands in US by State, 2010-2035 – Case 3

	SCAD Million		Thousand Person Years
	GDP	Compensation of Employees	Employment
Alabama	3,677	1,840	53
Alaska	1,456	315	7
Arizona	4,892	2,401	63
Arkansas	2,135	1,004	32
California	42,640	19,815	425
Colorado	9,123	4,312	98
Connecticut	4,806	2,366	43
Delaware	1,320	491	10
District of Columbia	1,315	809	12
Florida	14,392	6,996	193
Georgia	7,933	4,127	106
Hawaii	1,095	502	15
Idaho	1,090	556	18
Illinois	47,332	23,096	474
Indiana	7,040	3,492	86
Iowa	3,076	1,353	41
Kansas	5,530	2,690	65
Kentucky	3,473	1,709	50
Louisiana	9,709	3,080	74
Maine	955	501	17
Maryland	4,885	2,510	59
Massachusetts	7,287	4,138	80
Michigan	12,677	6,713	152
Minnesota	5,806	3,010	73
Mississippi	2,148	1,035	33
Missouri	4,888	2,591	71
Montana	8,578	4,059	88
Nebraska	1,679	792	24
Nevada	2,501	1,199	32
New Hampshire	1,233	681	17
New Jersey	9,918	5,039	98
New Mexico	1,727	608	19
New York	21,586	10,915	198
North Carolina	8,876	3,952	104
North Dakota	598	254	9
Ohio	18,626	9,385	216
Oklahoma	3,881	1,579	46
Oregon	4,095	1,925	51
Pennsylvania	11,462	5,916	142
Rhode Island	946	465	12
South Carolina	3,196	1,714	51
South Dakota	718	281	11
Tennessee	5,346	2,731	77
Texas	36,425	14,406	335
Utah	2,219	1,076	31
Vermont	491	254	8
Virginia	7,220	3,675	86
Washington	12,250	5,985	131
West Virginia	1,128	547	17
Wisconsin	20,045	9,849	216
Wyoming	1,065	273	8
Total US	396,491	189,016	4,378

Figure 1.12: Total Jobs (x 1,000) Created and Preserved in the US, 2010-2035 – Case 3

Lost Growth if Northern Gateway Pipeline Project Cancelled

As mentioned previously, Western Canada's 2011 total crude oil pipeline export capacity stands at 3.5 MMBPD. Keystone XL would add 700,000 BPD to that capacity, and the Northern Gateway Pipeline would add another 525,000 BPD; it would also serve to open up passage to the Pacific Rim. This would mean a sizeable increase in GDP and employment numbers for Alberta and Canada. If the Northern Gateway is cancelled, however, Canada would lose \$400 billion in additional GDP over the next quarter century – 95 percent of it lost within Alberta. The US would lose \$37 billion in GDP, with 37 percent of that amount lost in PADD II, 28 percent lost in PADD I, 16 percent lost in PADD V, 12 percent lost in PADD III, and the remaining 6 percent lost in PADD IV.

Cancellation of the Gateway project would see Canada foregoing approximately 2.1 million person years of employment creation. Alberta would lose 86 percent of this total, with Ontario losing 5.4 percent and British Columbia losing 3.5 percent.

The US will also lose out on employment creation if the Gateway project is cancelled; a total of 413 thousand person years of employment would be foregone. PADD II would lose 37 percent of the total, followed by PADD I (28 percent), PADD V (16 percent), PADD III (12 percent) and PADD IV (5.7 percent).

Uncollected federal, provincial, and municipal tax revenues in the event of a cancellation of Gateway would be highest in Alberta – more than \$77 billion in lost tax collections would be the result, which is 92 percent of the total foregone nationwide. Because most oil sands related employment occurs within Alberta, personal income tax would be most affected. Indirect taxes make up a greater proportion of the total in other jurisdictions. Royalties foregone to the Government of Alberta would total \$74 billion.

Case 4 – Announced and Potential Capacity

Case 4 assumes that all oil sands projects, regardless of their current status, will proceed; it also assumes that the required pipeline capacity will be constructed in time to prevent transportation bottlenecks. The difference between the impacts of Case 3 and Case 4, therefore, is a measure of the impacts attributable to construction and operating all planned oil sands projects over the study period and gauging the transportation capacity required to deliver all possible output to market.

Canadian Impacts

Cumulative cash injections into the oil sands industry over the next 25 years for Case 4 are estimated to be \$4,783 billion (see Figure 1.13). The cumulative sum of additional GDP from 2010 to 2035 as a result of the continued operation of existing oil sands projects, the start-up of projects under construction, and the development of new projects is estimated at \$4,925 billion (see Table 1.18). Employment in Canada (direct, indirect, and induced) is expected to grow from 390,000 jobs to a peak of 1,600,000 jobs in 2035 (Figure 1.13). Direct employment in Alberta is estimated at 132,000 jobs in 2010 and could grow to 533,000 jobs by 2035 if all projects proceed. Compensation of Canadian employees will reach a cumulative total of \$1,417 billion by 2035.

In terms of taxes, Table 1.20 shows that Alberta will see total taxes generated over the 25-year period approaching \$1 trillion. This does not include royalties, which will move above \$927 billion in total; the breakdown by year can be seen in Figure 1.14.

Table 1.18: Economic Impact of Oil Sands in Alberta, 2010-2035 – Case 4
Investments and Operations

Investments and Operations	CAD Million		Thousand Person Years
	GDP	Compensation of Employees	Employment
Alberta	4,662,765	1,271,074	22,788
British Columbia	63,774	35,195	943
Manitoba	9,708	5,250	150
New Brunswick	1,871	921	26
Newfoundland & Labrador	820	292	8
Northwest Territories	335	163	4
Nova Scotia	1,907	977	27
Nunavut	65	39	1
Ontario	142,656	82,065	1,942
Prince Edward Island	144	79	3
Quebec	31,105	17,365	468
Saskatchewan	10,362	4,496	125
Yukon Territory	88	55	2
Total Canada	4,925,599	1,417,971	26,487

Table 1.19: Jobs as a Result of Oil Sands Projects in Alberta, 2010-2035 – Case 4
Investments and Operations

	Direct	Indirect	Induced
Alberta	100.0%	82.1%	75.9%
British Columbia	0.0%	4.4%	6.3%
Manitoba	0.0%	0.7%	1.0%
New Brunswick	0.0%	0.1%	0.2%
Newfoundland & Labrador	0.0%	0.0%	0.1%
Northwest Territories	0.0%	0.0%	0.0%
Nova Scotia	0.0%	0.1%	0.2%
Nunavut	0.0%	0.0%	0.0%
Ontario	0.0%	9.6%	12.4%
Prince Edward Island	0.0%	0.0%	0.0%
Quebec	0.0%	2.2%	3.1%
Saskatchewan	0.0%	0.7%	0.8%
Yukon Territory	0.0%	0.0%	0.0%
SUM	100.0%	100.0%	100.0%

Figure 1.13: Jobs (x 1,000) Created and Preserved in Canada, 2010-2035 – Case 4

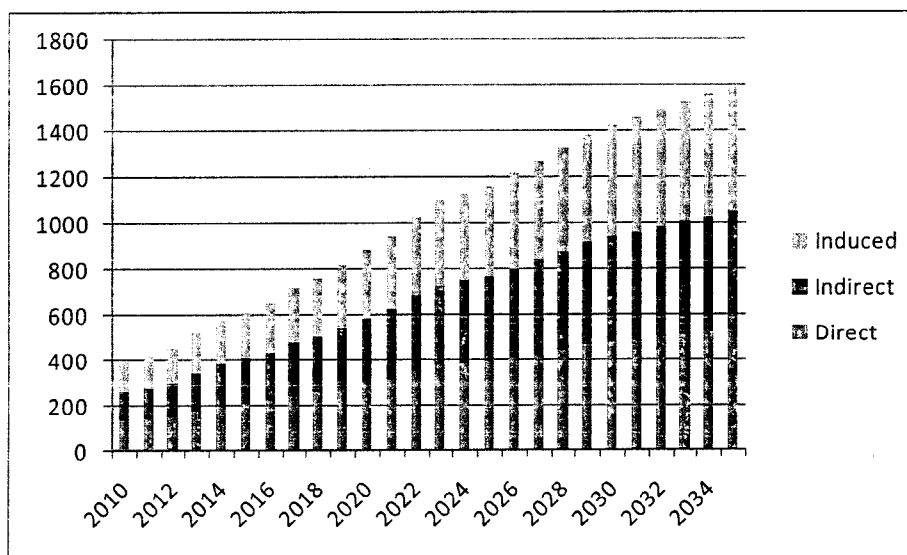
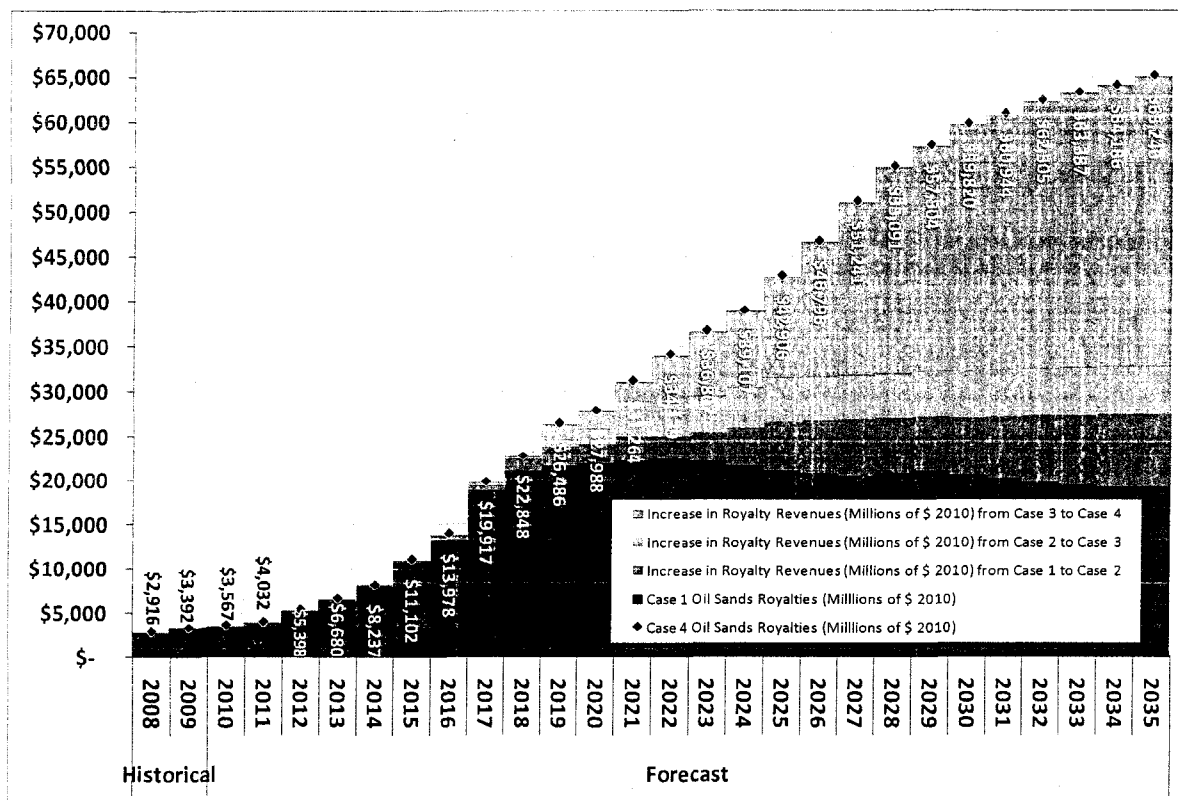


Table 1.20: Tax Receipts as a Result of Alberta Oil Sands Investments and Operations,
2010-2035 – Case 4
Federal and Provincial-Municipal

CAD Millions	Indirect Tax	Personal Income Tax	Corporate Tax	Sum
Alberta	289,498	445,128	219,725	954,350
British Columbia	8,436	6,959	1,577	16,972
Manitoba	1,478	1,063	174	2,715
New Brunswick	266	203	44	513
Newfoundland & Labrador	83	60	28	172
Northwest Territories	30	18	17	65
Nova Scotia	305	236	58	599
Nunavut	4	5	1	10
Ontario	22,680	17,034	7,071	46,785
Prince Edward Island	25	17	3	46
Quebec	5,732	4,484	1,302	11,518
Saskatchewan	1,724	958	584	3,266
Yukon Territory	8	7	1	16

Figure 1.14: Royalties Paid to the Alberta Government – Case 1 + Case 2 + Case 3 + Case 4



US Impacts

Total cumulative GDP impact in the US for Case 4 is estimated to be CAD\$774 billion over the 25-year projection period. Total employment in the US is projected to grow from 80,000 jobs created and preserved to a peak of 600,000 jobs created and preserved in 2035. Cumulative compensation of employees in the US will reach CAD \$368 billion by the end of the study period in 2035.

There is a significant difference in the US impacts for Case 4 compared to the US impacts for Case 3. The Northern Gateway pipeline, which determines Case 3 outcome, would be built entirely within Canada and would ship crude to a number of international destinations – not just the US. However, the infrastructure considered in Case 4 would be built to deliver crude almost exclusively to US markets; thus the impacts on the US would be considerable.

Table 1.21 indicates that the greatest US impacts would be felt in PADD II. Table 1.22 shows the economic impacts on the US by state for Case 4.

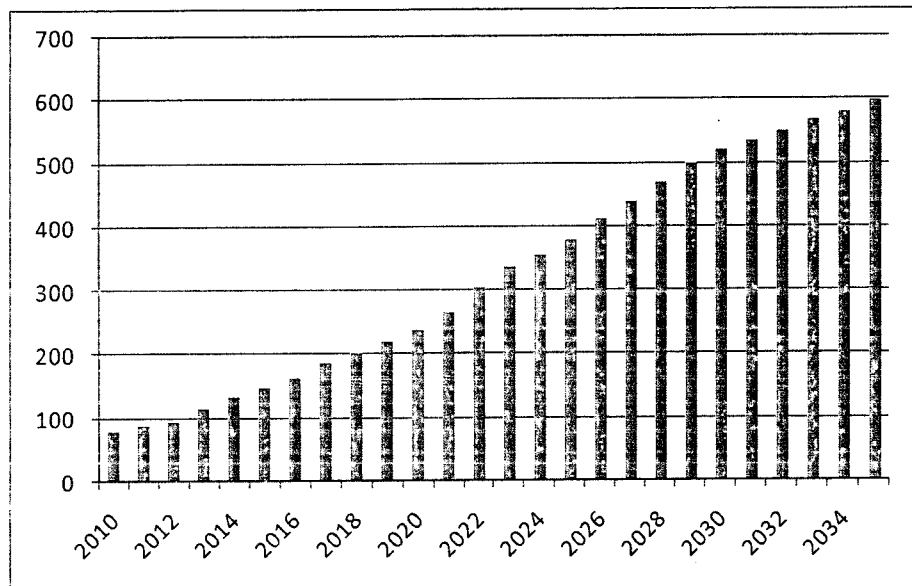
**Table 1.21: Total Economic Impact of Alberta Oil Sands in US by State,
2010-2035 – Case 4**

2010-2035	SCAD Million		Thousand Person
	GDP	Compensation of Employees	Years Employment
PADD I	214,209	108,135	2,446
PADD II	272,713	134,584	3,110
PADD III	109,355	42,982	1,064
PADD IV	42,385	19,691	465
PADD V	135,391	63,045	1,416
Total US	774,052	368,436	8,502

Table 1.22: Total Economic Impact of Alberta Oil Sands by US PADD – Case 4

	SCAD Million		Thousand Person
	GDP	Compensation of Employees	Years
Alabama	7,279	3,635	104
Alaska	2,845	612	14
Arizona	9,655	4,730	123
Arkansas	4,209	1,977	62
California	84,022	38,996	832
Colorado	17,597	8,304	188
Connecticut	9,469	4,653	84
Delaware	2,578	959	20
District of Columbia	2,562	1,575	23
Florida	28,230	13,704	377
Georgia	15,575	8,088	206
Hawaii	2,134	976	29
Idaho	2,176	1,106	36
Illinois	90,322	44,037	901
Indiana	14,007	6,932	169
Iowa	6,118	2,690	81
Kansas	10,627	5,164	124
Kentucky	6,886	3,381	98
Louisiana	18,832	5,937	143
Maine	1,877	983	33
Maryland	9,597	4,922	115
Massachusetts	14,416	8,157	158
Michigan	24,932	13,175	297
Minnesota	11,467	5,931	144
Mississippi	4,221	2,030	65
Missouri	9,642	5,098	140
Montana	16,170	7,638	165
Nebraska	3,313	1,561	47
Nevada	4,875	2,334	62
New Hampshire	2,454	1,349	33
New Jersey	19,429	9,857	191
New Mexico	3,407	1,201	38
New York	42,335	21,370	387
North Carolina	17,559	7,812	204
North Dakota	1,188	504	18
Ohio	36,217	18,225	417
Oklahoma	7,656	3,113	90
Oregon	8,302	3,898	103
Pennsylvania	22,581	11,631	277
Rhode Island	1,860	913	23
South Carolina	6,336	3,388	99
South Dakota	1,422	558	21
Tennessee	10,614	5,408	151
Texas	71,407	28,202	653
Utah	4,365	2,114	61
Vermont	972	502	15
Virginia	14,166	7,199	168
Washington	23,558	11,499	252
West Virginia	2,215	1,072	33
Wisconsin	38,303	18,807	412
Wyoming	2,077	529	15
Total US	774,052	368,436	8,502

Figure 1.15: Total Jobs (x 1,000) Created and Preserved in the US, 2010-2035 – Case 4



Lost Growth if Further Pipeline Capacity Cancelled

Besides the Keystone XL and Northern Gateway projects, additional pipeline capacity would be needed in order to transport the volumes of crude bitumen produced, assuming that all oil sands projects – on stream, under construction, approved, approved – on hold, awaiting approval, and announced – are developed.

In this hypothetical situation, CERI projects that a total of 2.3 MMBPD of pipeline capacity, above and beyond Keystone XL and Gateway, could be feasibly constructed. This would grow export capacity significantly and bring a high degree of GDP and employment growth.

Cancellation of this extra capacity, though, would result in significant lost growth. Approximately \$1.6 trillion of additional Canadian GDP growth over the study period would be lost, with 95 percent of that GDP lost within the province of Alberta. In the United States, an additional \$377 billion in GDP would be lost, with 35 percent lost in PADD II, 28 percent lost in PADD I, 18 percent lost in PADD V, 14 percent lost in PADD III, and the remaining 5 percent lost in PADD IV.

Foregone employment in Canada would total approximately 8.8 million person years. Again, Alberta would lose the most, approximately 86 percent, with Ontario losing 7.3 percent, and BC losing 3.5 percent.

The US would also be affected substantially in terms of employment with about 60 percent as much employment at risk as Canada. In total, the US stands to lose 4.1 million person years of employment years, with PADD II losing 36 percent of the total, followed by PADD I (29 percent), PADD V (17 percent), PADD III (13 percent) and PADD IV (5 percent).

No construction of further pipeline infrastructure after Keystone XL and Gateway would affect federal, provincial, and municipal tax revenues in the following ways: Alberta would see more than \$311 billion in foregone tax collections, which is 92 percent of the Canadian total. As discussed earlier, most oil

sands related employment occurs within Alberta, therefore personal income tax would be most affected in that jurisdiction. Indirect tax makes up the greatest proportion of the total in other provinces, followed by personal and then corporate taxes. The nationwide total of foregone tax revenue, not including Alberta, would amount to approximately \$339 billion. Royalties foregone to the Government of Alberta would total \$302 billion.

Concluding Remarks

This report evaluated the economic impacts of staged development of Alberta's oil sands projects. The report showed that without additional pipeline capacity (assuming only the existing export capacity out of Western Canada), the benefits that will be lost in Alberta, Canada and the US are substantial.

As oil sands production increases, more pipeline capacity and more diluent will be needed. Pipelines will be needed within Alberta (i.e., regional pipelines) as well as outside Alberta to reach markets in the US and Pacific Rim through accessing Canada's West Coast. In an effort to continue to investigate issues pertaining to accessing markets and transportation, CERI will be undertaking a new study. A significant part of this new study will focus on the relative dynamics of the upstream and downstream industries and identify various markets for Canadian crude and how they can be accessed, specifically the energy-hungry Asian markets. Based on CERI's oil sands production forecast, we estimate the timing and magnitude of regional pipeline additions and discuss numerous proposals that have been announced for new pipeline projects. Also, we take a closer look at export pipeline proposals, including Northern Gateway and Trans Mountain that would help Canadian crude, namely oil sands bitumen to reach Pacific Rim.

Diluent supply – another major issue affecting the oil sands production – will be discussed in the new study as well. Condensate supply in Western Canada from natural gas production is near its peak, while diluent demand is increasing, reflecting higher bitumen production. Condensate is in short supply and this has resulted in a significant price premium. Some potential sources of condensate include imports and diluent recycling but economical transportation systems would be required. We will assess the potential for condensate imports, either from the US or internationally (through inclusion of an eastbound twin condensate pipeline of the Gateway project) and look at the potential impact the diluent may have on bitumen netback prices.

Canadian Energy Research Institute's (CERI) Methodology and Latest Results

CERI's analysis is based on a multi-regional input-output (I/O) methodology that uses a table of inter-industry transactions to estimate the inputs required to produce a unit of another sector's goods or service. CERI uses these inter-industry tables to estimate other industry outputs required to support the oil sands sector; CERI then estimates the potential direct and indirect economic benefits that would result from projected oil sands activity and investments over the next 25-years. Their model then uses a multiplier to calculate the induced effects that this increased economic activity and employment would generate throughout the Canadian and United States (U.S.) economies. These direct, indirect and induced activities associated with oil sands development are defined as follows:

- **Direct:** Located in Alberta and consist of geological expenditures, drilling and other extraction expenditures, facility construction and site restoration at end of field's useful life;
- **Indirect:** Direct activities generate demand for the goods and services produced by other sectors, such as steel pipe, electricity, transportation, financial and administrative services. These inter-industry transactions are captured in the I/O tables published by Statistics Canada and the U.S. Bureau of Economic Analysis;
- **Induced:** Both the direct and indirect activities raise income levels that lead to an induced effect in response to this increased spending, which is distributed based on consumer spending patterns in both Canada and the U.S.

Statistics Canada I/O tables do not disaggregate the Mining, Oil and Gas Extraction sector. Therefore, CERI's model estimates the inputs that would flow to five different subsectors (i.e. Conventional oil, Oil sands, Natural gas and natural gas liquids, Coal and Other mining) by assigning a weight to each input (i.e. 0, 25, 50, 75, 100 percent).

Similarly, given that the trade flow patterns between individual provinces and the U.S. are not provided by Statistics Canada I/O tables, CERI estimates the trade flows by reviewing data from a variety of sources, such as the National Energy Board and industry trade specialists.

The economic impact of the oil sands industry on the overall national economy is derived by summing up the direct, indirect and induced (multiplier) impacts across sectors and regions, and comparing them to the Gross Domestic Product and employment in the absence of this investment and activity.

Comparison of CERI's Results (both 2009 & 2011 Studies) against latest Statistics Canada Data

	Current Statistics Canada Data	2009 CERI Study	May 2011 CERI Study (includes only new projects)	Existing Pipelines (Case 1)	July 2011 CERI Study + Keystone XL (Case 2)	+ Northern Gateway (Case 3)	All necessary pipeline (Case 4)
CANADIAN DATA							
Production (MMB/D)	1.5 in 2010	2.1 in 2015 4.3 in 2030	2.1 in 2015 4.9 in 2035	3.1 in 2020 (peak)	3.8 in 2020 (peak)	4.3 in 2020 (peak)	7.0 in 2035 (peak)
Investment	\$11B in 2010	\$218B over 25 yrs \$9B/year	\$2.1B over 25 yrs \$83B/year	\$2.2B over 25 yrs \$88B/year	\$2.8B over 25 yrs \$112B/year	\$3.2B over 25 yrs \$128B/year	\$4.8B over 25 yrs \$192B/year
Direct Employment in 2010	NA (~40,000 – 50,000 jobs)	48,840 jobs	25,500 jobs		132,000 jobs		
Peak Direct Employment	NA	200,000 jobs in 2033	307,000 jobs in 2035	163,000 jobs in 2020	229,000 jobs in 2020	268,000 jobs in 2020	533,000 jobs in 2035
Total Employment in 2010 (Direct, Indirect, Induced)	NA	148,000 jobs	75,000 jobs		390,000 jobs		
Peak Total Employment	NA	590,000 jobs in 2033	905,000 jobs in 2035	490,000 jobs in 2020	690,000 jobs in 2020	790,000 jobs in 2020	1.6M jobs in 2035
Cumulative Employment, 2010-2035	NA	11,419,000 person years	11,686,000 person years	12,046,000 person years	15,563,000 person years	17,697,000 person years	26,487,000 person years
Total GDP over 25 years	NA	\$1.7 Trillion	\$2.1 Trillion	\$2.3 Trillion	\$2.9 Trillion	\$3.3 Trillion	\$4.9 Trillion
Oil Sands direct contribution to GDP per year	NA (~15B in 2010)	~23B/year	~29B/year	~31B/year	~40B/year	~45B/year	~67B/year
US DATA							
US Cumulative Employment	NA	625,000 person years by 2025	5,688,000 person years by 2035	2,328,000 person years by 2035	4,000,000 person years by 2035	4,380,000 person years by 2035	8,500,000 person years by 2035
Average US Employment	NA	36,765 jobs	227,520 jobs	93,120 jobs	160,000 jobs	175,000 jobs	340,000 jobs
US Peak Total Employment	NA	343,000 jobs (2011 -2015)	465,000 jobs in 2035	94,000 jobs in 2020	179,000 jobs in 2020	200,000 jobs in 2020	600,000 jobs in 2035
US GDP over 25 years	NA	\$531B by 2025	\$521B by 2035	\$210B by 2035	\$359B by 203	\$397B by 2035	\$775B by 2035
ROYALTIES AND TAXES							
Alberta Royalties	\$3.3B in 2009	\$185B over 25 yrs \$7.4 B per year	\$350B over 25 yrs \$48B/Y by 2035	\$450B over 25 yrs \$22B/Y by 2020	\$550B over 25 yrs \$27B/Y by 2025	\$618B over 25 yrs \$33B/Y by 2035	\$927B over 25 yrs \$65B/Y by 2035
Corporate Income Taxes (F/P)	\$4B in 2009 for O&G Sector	\$306B over 25 yrs	\$99B over 25 yrs	\$107B over 25 yrs	\$137B over 25 yrs	\$156B over 25 yrs	\$231B over 25 yrs

Personal Income Tax (F/P)	NA		\$204B over 25 yrs	\$220B over 25 yrs	\$282B over 25 yrs	\$321B over 25 yrs	\$476B over 25 yrs
Indirect Taxes (F/P/M)	NA		\$142B over 25 yrs	\$153B over 25 yrs	\$195B over 25 yrs	\$222B over 25 yrs	\$330B over 25 yrs

Attachment 3
w/123355

EDU

From: ES.SE Ministerial Correspondence-Correspondance ministérielle
Sent: 2011-07-28 12:42 PM
To: EDU
Cc: ES.SE Ministerial Correspondence-Correspondance ministérielle
Subject: URGENT: Docket # 123355 - CERI Oil Sands Impact

Importance: High

Attachments: 123355 Attachment 3 CERI Study.pdf

Hi Carmen,

URGENT

This docket has been routed to EDU yesterday but Attachment 3 just came in, can you please make sure that it goes in the above-mentioned docket.



123355
hment 3 CERI St

Thank you so much.
Carmen Caron

Page(s) 000185 to / à 000200

**is (are) exempted and excluded pursuant to section(s)
est(sont) exemptée(s) et exclue(s) en vertu de(s)(l')article(s)**

**69(1)(g) re: , 21(1)(c), 21(1)(b), 21(1)(b), 21(1)(a), 21(1)(c),
21(1)(a)**

**of the Access to Information
Loi sur l'accès à l'information**

OCT - 5 2011



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OCT 05 2011

MEMORANDUM TO THE DEPUTY MINISTER

CARBON PRICING

(Information by October 7, 2011)

SUMMARY

- The purpose of the note is to inform you of the Australian government's intention to pass a bill to implement a carbon tax.
- A summary of carbon prices in various jurisdictions is provided under Attachment 1.

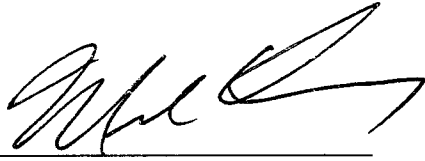
BACKGROUND

Australia is the latest jurisdiction to announce its intention to implement a carbon tax. On October 12, 2011, the parliament will vote to apply a tax of \$23 per tonne of carbon dioxide on its 500 largest emitters.

Although this has been called a carbon tax, it is actually a fixed price for emissions credits. The price of credits will rise annually at 2.5 percent over inflation and transit to a floating-price emissions trading scheme from July 1, 2015. ✓

The Honourable Julia Gillard, Prime Minister of Australia, leads a minority government and needs the support of independents supportive of the carbon tax for survival. Therefore, passage of the bill is likely. ✓

However, outside of the non-governmental organization community, there is little support from industry and the general population. A Nielsen poll conducted mid-August indicated that 56 percent of Australian voters are against the tax scheme.

A handwritten signature in black ink, appearing to read 'Mark Corey', is positioned above a horizontal line.

Mark Corey

Attachment: (1)

Contact: David Henry, 613-996-6474
Energy Policy Branch, ES

Examples of Carbon Prices in Various Jurisdictions

Jurisdiction	Instrument	Carbon Price ¹	Comments
Australia	Carbon Tax from July 1, 2012; Emissions Trading from July 1, 2015.	\$23.13 ² /t CO ₂ (on largest 500 emitters)	Scheduled for a vote in parliament October 12, will become law by November 21 if passed.
European Union	Emissions Trading	\$15.89 ³ /t CO ₂	
New Zealand	Tax-or-Trade	\$10.02 ⁴ /t CO ₂ (tax) \$11.70 ⁵ /t CO ₂ (market spot price)	No overall cap on allocation of credits
California	Emissions Trading	\$21.35 ⁶ /t CO ₂ (speculative trading of Dec 2013 offsets)	Facing delays in implementation due to lawsuits.
Western Climate Initiative	Emissions Trading	To be determined	Proposed to begin January 2012
Regional Greenhouse Gas Initiative	Emissions Trading	\$1.91 ⁷ /t CO ₂ (Dec 2012 allowances)	
Midwestern Greenhouse Gas Reduction Accord	Emissions Trading	N/A	Proposed but not currently operating.
British Columbia	Carbon Tax on Fuel	\$25/t CO ₂ 5.56¢/L gasoline 6.39¢/L light fuel oil 4.75¢/m ³ natural gas 3.85¢/L propane \$51.93/t high heat coal	Revenue-neutral tax on consumption, with funds channelled back to taxpayers as income tax cuts.
Alberta	Carbon Tax on Excess Emissions	\$15/t CO ₂	Emitters over 100,000 t must make reductions or pay for the excess.
Quebec	Carbon Tax on Fuel	0.8¢/L gasoline 0.9¢/L diesel 0.5¢/L propane \$8/t coal	Fossil fuels taxed on the production side.

¹ All values are in Canadian dollars, and current as of September 22nd, 2011 unless otherwise noted.

² AU\$23, where AU\$1 = C\$1.005.

³ €11.45, where €1 = C\$1.388.

⁴ NZ\$12.50, where NZ\$1 = C\$0.802.

⁵ NZ\$14.60, same as (3).

⁶ US\$18.75 per short ton, where US\$1 = C\$1.033 and 1 ton = 0.90718474 metric tonnes.

⁷ US\$1.75 per short ton, traded Monday, September 19th, 2011, where US\$1 = C\$0.98988 and 1 ton = 0.90718474 metric tonnes.

Further Details on Carbon Pricing Strategies in Various Jurisdictions

A. International

- On October 12th, 2011, the Government of Australia will vote to apply a tax of AU\$23 per tonne of CO₂ on its 500 biggest emitters. Although this has been called a carbon tax, it is actually a fixed price for emissions credits. The price of credits will rise annually at 2.5 per cent over inflation and transit to a floating-price emissions trading scheme from July 1st, 2015.
- The European Union created the first large-scale emissions trading system (ETS) in 2005. It operates in 30 countries and requires large emitters, such as power plants and emissions-intensive industries, to surrender enough credits to cover their annual GHG emissions. Facilities receive a specified amount of free permits, and can buy or sell them in the marketplace depending on whether each has a shortfall or a surplus. An overall cap on the number of permits is intended to gradually reduce the combined emissions of participating countries.
- New Zealand launched its own ETS in 2008, and recently expanding it to include more sectors of the economy. Unlike the EU ETS, there is no overall cap on the number of credits in the market. However, there are far fewer credits allocated for free, and companies can either surrender credits traded in the New Zealand market, or pay a tax of NZ\$12.50 per tonne of CO₂ or other GHG equivalent emitted. After January 1st, 2013, the price of a New Zealand credit will be determined by the international carbon market.

B. North America

- In 2009 when Barack Obama was elected in the US, and the House of Representatives passed the Waxman-Markey Bill, it appeared likely that the US would implement an emissions trading, or cap-and-trade, system to put a price on carbon. At that time, the Government of Canada also examined the possibility of using a cap-and-trade system in Canada. However, the Senate version of the Waxman-Markey Bill failed to pass,

s.15(1)

s.21(1)(b)

- Within North America, there are several carbon pricing approaches at the regional, state, and provincial level:
 - The Western Climate Initiative (WCI) is a proposed ETS that would encompass several participating states and provinces (BC, Manitoba, Ontario and Québec), to be implemented in January 2012;

- The Regional Greenhouse Gas Initiative is a legally binding ETS which allows the use of credits and offsets. Jointly run by ten northeastern US states since 2009, it places an overall cap on the region's CO₂ emissions of 188 million tonnes;
- The Midwestern Greenhouse Gas Reduction Accord is an initiative of the US Midwestern Governors Association. A cap-and-trade system was recommended in a January 2009 report, but it has yet to be implemented.
- California intends to implement a state-wide ETS, to become enforceable January 1st, 2012, although covered entities will not have emissions obligations until 2013;
- Alberta has effectively set a carbon price: under Alberta's *Climate Change and Emissions Management Act* (2007), companies that produce more than 100,000 tonnes of greenhouse gas (GHG) emissions annually must reduce their emissions intensity by 12% below 2005 levels. To comply with the act they can buy offsets within Alberta or pay a tax of \$15 per tonne of CO₂ emitted over their reduction target into a provincial green technology fund.
- British Columbia has a carbon tax on fossil fuels. An overall carbon price of \$25 per tonne of CO₂ is used to determine an appropriate tax on fossil fuel purchases, based on the emissions intensity of each fuel. As a participant in the WCI, BC also intends to participate in emissions trading.
- Québec also has a carbon tax on fossil fuels. The tax is paid by fossil fuel producers, and the effective carbon price is about 14% of the carbon price in BC.



OCT 05 2011

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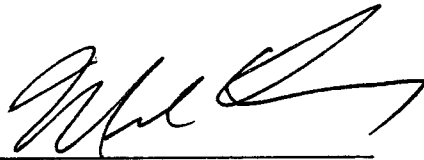
BACKGROUND

Australia is the latest jurisdiction to announce its intention to implement a carbon tax. On October 12, 2011, the parliament will vote to apply a tax of \$23 per tonne of carbon dioxide on its 500 largest emitters.

Although this has been called a carbon tax, it is actually a fixed price for emissions credits. The price of credits will rise annually at 2.5 percent over inflation and transit to a floating-price emissions trading scheme from July 1, 2015.

The Honourable Julia Gillard, Prime Minister of Australia, leads a minority government and needs the support of independents supportive of the carbon tax for survival. Therefore, passage of the bill is likely.

However, outside of the non-governmental organization community, there is little support from industry and the general population. A Nielsen poll conducted mid-August indicated that 56 percent of Australian voters are against the tax scheme.

A handwritten signature in black ink, appearing to read 'Mark Corey', written over a horizontal line.

Mark Corey

Attachment: (1)

Contact: David Henry, 613-996-6474
Energy Policy Branch, ES

Examples of Carbon Prices in Various Jurisdictions

Jurisdiction	Instrument	Carbon Price ¹	Comments
Australia	Carbon Tax from July 1, 2012; Emissions Trading from July 1, 2015.	\$23.13 ² / t CO ₂ (on largest 500 emitters)	Scheduled for a vote in parliament October 12, will become law by November 21 if passed.
European Union	Emissions Trading	\$15.89 ³ / t CO ₂	
New Zealand	Tax-or-Trade	\$10.02 ⁴ / t CO ₂ (tax) \$11.70 ⁵ / t CO ₂ (market spot price)	No overall cap on allocation of credits
California	Emissions Trading	\$21.35 ⁶ / t CO ₂ (speculative trading of Dec 2013 offsets)	Facing delays in implementation due to lawsuits.
Western Climate Initiative	Emissions Trading	To be determined	Proposed to begin January 2012
Regional Greenhouse Gas Initiative	Emissions Trading	\$1.91 ⁷ / t CO ₂ (Dec 2012 allowances)	
Midwestern Greenhouse Gas Reduction Accord	Emissions Trading	N/A	Proposed but not currently operating.
British Columbia	Carbon Tax on Fuel	\$25/ t CO ₂ 5.56¢/ L gasoline 6.39¢/ L light fuel oil 4.75¢/ m ³ natural gas 3.85¢/ L propane \$51.93/ t high heat coal	Revenue-neutral tax on consumption, with funds channelled back to taxpayers as income tax cuts.
Alberta	Carbon Tax on Excess Emissions	\$15/ t CO ₂	Emitters over 100,000 t must make reductions or pay for the excess.
Quebec	Carbon Tax on Fuel	0.8¢/ L gasoline 0.9¢/ L diesel 0.5¢/ L propane \$8/ t coal	Fossil fuels taxed on the production side.

¹ All values are in Canadian dollars, and current as of September 22nd, 2011 unless otherwise noted.

² AU\$23, where AU\$1 = C\$1.005.

³ €11.45, where €1 = C\$1.388.

⁴ NZ\$12.50, where NZ\$1 = C\$0.802.

⁵ NZ\$14.60, same as (3).

⁶ US\$18.75 per short ton, where US\$1 = C\$1.033 and 1 ton = 0.90718474 metric tonnes.

⁷ US\$1.75 per short ton, traded Monday, September 19th, 2011, where US\$1 = C\$0.98988 and 1 ton = 0.90718474 metric tonnes.

Further Details on Carbon Pricing Strategies in Various Jurisdictions

A. International

- On October 12th, 2011, the Government of Australia will vote to apply a tax of AU\$23 per tonne of CO₂ on its 500 biggest emitters. Although this has been called a carbon tax, it is actually a fixed price for emissions credits. The price of credits will rise annually at 2.5 per cent over inflation and transit to a floating-price emissions trading scheme from July 1st, 2015.
- The European Union created the first large-scale emissions trading system (ETS) in 2005. It operates in 30 countries and requires large emitters, such as power plants and emissions-intensive industries, to surrender enough credits to cover their annual GHG emissions. Facilities receive a specified amount of free permits, and can buy or sell them in the marketplace depending on whether each has a shortfall or a surplus. An overall cap on the number of permits is intended to gradually reduce the combined emissions of participating countries.
- New Zealand launched its own ETS in 2008, and recently expanding it to include more sectors of the economy. Unlike the EU ETS, there is no overall cap on the number of credits in the market. However, there are far fewer credits allocated for free, and companies can either surrender credits traded in the New Zealand market, or pay a tax of NZ\$12.50 per tonne of CO₂ or other GHG equivalent emitted. After January 1st, 2013, the price of a New Zealand credit will be determined by the international carbon market.

B. North America

- In 2009 when Barack Obama was elected in the US, and the House of Representatives passed the Waxman-Markey Bill, it appeared likely that the US would implement an emissions trading, or cap-and-trade, system to put a price on carbon. At that time, the Government of Canada also examined the possibility of using a cap-and-trade system in Canada. However, the Senate version of the s.15(1) s.21(1)(b) Waxman-Markey Bill failed to pass, [REDACTED]
- Within North America, there are several carbon pricing approaches at the regional, state, and provincial level:
 - The Western Climate Initiative (WCI) is a proposed ETS that would encompass several participating states and provinces (BC, Manitoba, Ontario and Québec), to be implemented in January 2012;



N11-125142

MEMORANDUM TO THE DEPUTY MINISTER

OCT 20 2011

**TREATMENT OF CANADIAN CRUDE OIL UNDER
CALIFORNIA'S LOW CARBON FUEL STANDARD**

(Decision by October 20, 2011)

SUMMARY

- The purpose of this note is to seek your approval of a letter from Cassie Doyle, Canada's Consul General in San Francisco, addressed to John Laird, California's Secretary of Natural Resources. The letter seeks to register Canada's concerns with California's Low Carbon Fuel Standard (LCFS), and to provide information on the timing, considerations, and proposed Government of Canada next steps.
- Natural Resources Canada (NRCan), Foreign Affairs and International Trade Canada (DFAIT) and the Government of Alberta are pursuing coordinated messaging to intervene on the proposed treatment of crude oil under the LCFS.
- The strategy includes: the aforementioned letter from Consul General Doyle; setting-up Canada-Alberta rapid response team to review the proposed amendments when they are released later this month; and possible outreach in advance of the December 15–16, 2011, California Air Resources Board (CARB) vote on the amendments to the LCFS.

BACKGROUND

California's LCFS: California's LCFS requires Californian fuel suppliers (refiners and importers) to reduce the carbon intensity of the fuel they supply into the market. The LCFS aims to reduce the carbon intensity of California's fuel by 10 percent by 2020 over 2010 levels.

Although established in 2009, to date, two six-month exemptions have been applied, which have delayed implementation of the LCFS until the end of 2011. With further exemptions unlikely to be granted, it is expected that amended LCFS implementation measures will take effect in early 2013.

Preliminary Draft Regulatory Amendment: On October 14, 2011, CARB released preliminary draft amendments to the implementing regulations for the LCFS. The draft proposes establishing a crude oil carbon intensity for the entire State of California based on the lifecycle greenhouse gas (GHG) profiles of gasoline and diesel consumed in California in 2009. This approach allows the composition of crude oil slate consumed within the State to shift without penalty, as long as the carbon intensity of crude oils does not increase. For example, Californian refiners could replace declining supplies of Mexican heavy crude oil with oil sands crude.

s.15(1)
s.21(1)(b)

Process and Timing: Towards the end of October 2011, a final draft regulatory option for the treatment of carbon intensive crude oil will be released for a 45-day public comment period. CARB is scheduled to meet on December 15–16, 2011, to vote on the regulatory amendment option and it is anticipated that implementation will come into effect in early 2012.

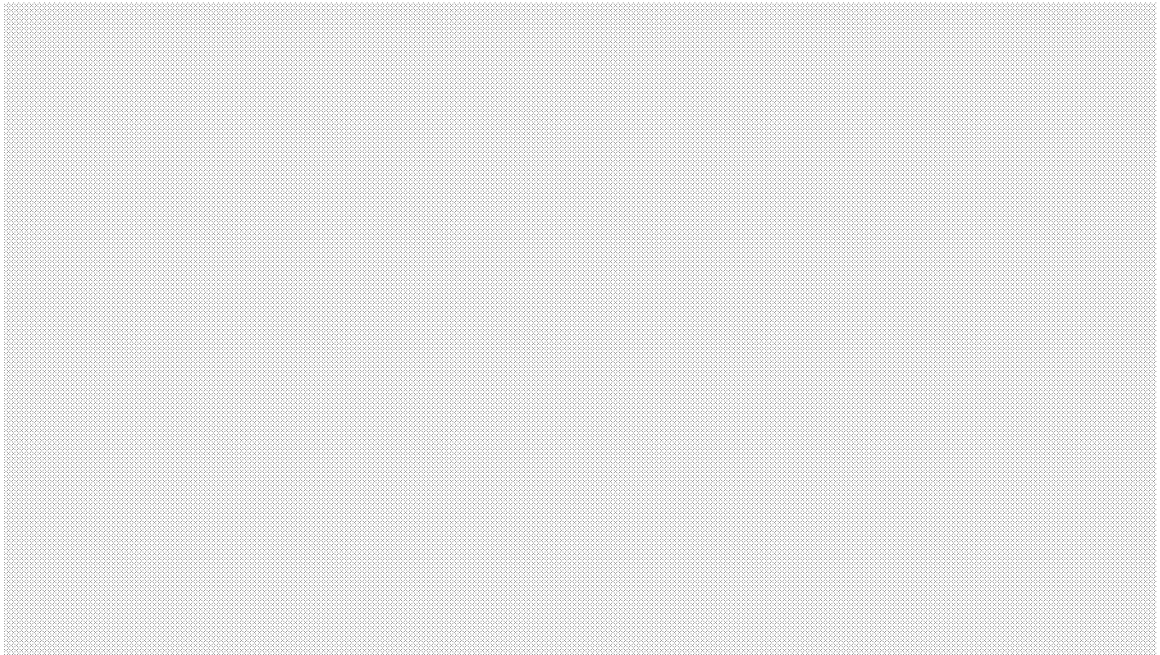
CONSIDERATIONS

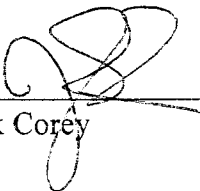
s.14

s.20(1)(b)
s.21(1)(b)

NEXT STEPS

s.14
s.21(1)(c)




for Mark Corey

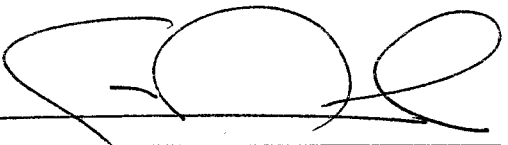
Attachments: (2)

Contact: Jeff Labonté, 613-992-8609
Petroleum Resources Branch, ES

I agree ☒

I disagree ☐

I wish to discuss ☐


Serge P. Dupont, Deputy Minister
Date: OCT 20 2011

PROPOSED TREATMENT OF CRUDE OIL UNDER CALIFORNIA'S LOW CARBON FUEL STANDARD

On October 14, 2011, the California Air Resources Board (CARB) released a 106-page preliminary draft regulation, which details the implementation of the Low Carbon Fuel Standard (LCFS). Under CARB's proposed regulation, the carbon intensity (CI) of Californian transportation fuel needs to be reduced by 10% from 2010 levels by 2020. The CI is measured in grams of CO₂ equivalent emissions per megajoule for 2010.

In addition, CARB proposes an approach to deal with any increases in the share of high CI crude oils used in the state. This is done through a "California Average Approach" that will counteract any CI increases in the California crude oil slate by requiring companies to make commensurate reductions.

Refiners and importers can meet the LCFS requirement by reducing the CI of the crude oil they use through: (i) actions that decrease life-cycle emissions, such as blending biofuels (ii) purchasing credits from companies that provide alternate transportation fuels, such as low GHG intensive electricity, (iii) creating credits through investing in innovative technology, or (iv) offsetting any emissions increases with other reductions within the State of California.

For illustrative purposes, outlined below is how the implementation of the LCFS's California Average Approach may be applied to California refiners and importers of transportation fuels.

- **To meet the LCFS's target of a 10% reduction by 2020**, CARB sets out the average CI requirements for gasoline and diesel under the LCFS. Higher incremental reductions are required in the latter part of the compliance period. Please see the table below (for gasoline).

Average Carbon Intensity Requirements for Gasoline		
Year	Average CI Requirement (gCO₂E/MJ)	% Reduction
2013	96.42	1.00
2014	95.93	1.50
2015	94.95	2.51
2016	93.98	3.50
2017	92.52	5.00
2018	91.06	6.50
2019	89.6	8.00
2020	87.65	10.00

- **Under this approach, crude oils are still differentiated as to whether they are high CI crude oils or not** – The LCFS sets two tiers for crude oil, high CI crude oil and others. High CI crude oil will likely include most oil sands crude, other heavy crude oils (including California heavy crude oil) and lighter oils with high rates of flaring.

- Under this approach, the shares of high CI crude oils used in the State can change without impacting the California average. As heavy Californian crude oil is depleted, other heavy crude oils, including oil sands crude, could instead without penalty.
- **To account for any shifts towards more CI crude oil used in California from 2010 to 2020** - At the end of 2012, California will recalculate the State's average crude oil CI and, if the average has increased from 2010 base year levels, then companies are required to make further reductions to make up this difference.
 - Notably, the additional reduction requirement appears to be shared equally across all Californian fuel suppliers, irrespective of their individual actions, i.e., whether they increased the CI of their own crude oil or not.
 - The point above is notable as it is not clear how this provision could impact the decisions of fuel suppliers¹. While heavy oil trades at a discount to light oil, significant investments are required to retool refineries to process heavy crude oil vs. light crude oil.

¹ The provision could result in a "Prisoner's Dilemma," whereby all suppliers would have an incentive to increase their heavy oil consumption (which tends to be more CI), as the penalty for doing so would accrue to all the entire industry.

**Draft letter from Cassie Doyle to the
California Secretary of Natural Resources, John Laird
Copy to California Air Resources Board
Copy to California Energy Commission**

Dear Secretary Laird:

It was a pleasure to meet with you last month. I am writing to follow-up on the discussions you had with Canada's Minister of Natural Resources, the Honourable Joe Oliver, regarding an issue that is of ongoing concern to Canada: the treatment of Canadian oil sands crude under California's Low Carbon Fuel Standard (LCFS).

I understand that the California Air Resources Board (CARB) will be meeting in mid-December to vote on proposed amendments to the regulation, and I appreciate your consideration in helping to ensure the treatment of crude oil under the LCFS is fair, proportional and grounded in science.

Canada is supportive of California's efforts to reduce greenhouse gas (GHG) emissions from the transportation sector.

**s.21(1)(a)
s.21(1)(c)**

Furthermore, Canada would like to ensure the LCFS: (i) applies equal scrutiny and proportional treatment to crude oil sources based on actual GHG emissions; (ii) encourages transparency from crude oil producers; and (iii) does not duplicate Canada's existing regulatory measures.

As you will recall, on a life-cycle basis (i.e. from well-to-wheels), oil sands crude has GHG emissions similar to other crude oils used in California, including California's own heavy crude oil, as well as crude oil from Venezuela, Angola, Nigeria, and some heavy Middle Eastern crude oils. The LCFS should seek to assign individual GHG values to all crude oils used in California and allow each crude oil to stand on its own merits, based on sound science.

In terms of transparency, Canada supplies detailed, verifiable data regarding GHG emissions from the production of crude oil. In contrast, several other Californian suppliers have relatively lax or opaque regulatory oversight and lack data concerning their oil sector's GHG emissions. The LCFS should encourage transparency from other crude oil producers to ensure that the carbon intensities of crude oils used in California are not based on estimates or concealed by using country or regional averages.

The LCFS should also avoid duplicating existing Canadian regulatory measures. Unlike most other major oil producers and exporters, Canada is a responsible supplier of crude oil, with a highly regulated oil industry. Canada also has an economy-wide GHG emissions reduction target of 17 percent below 2005 levels by 2020, as inscribed in the Copenhagen Accord and aligned with the United States (U.S.). Federal regulations are being developed for the oil sands as part of Canada's sector-by-sector approach to meet this target. The Province of Alberta, where oil sands crude is produced, has regulations to limit GHG emissions already in place, which includes a carbon price for the energy industry where emitters fail to meet reduction targets. Canada believes that the LCFS should reflect actions taken by Canadian producers to meet domestic regulations and should account for the fact that both Canada and the U.S. have aligned, economy-wide GHG reduction targets.

Finally, as California is a major importer of crude oil, I trust that CARB takes into account the implications of the LCFS for California's energy security. Any policy that impedes the market-based flow of global crude oil supplies could have a negative impact on the security of California's energy supply. For its part, Canada seeks to remain a stable, reliable and responsible supplier.

Yours sincerely,

Cassie Doyle
Consulate General of Canada
San Francisco/Silicon Valley

Draft Letter:

→ consulted with CIAPP
and Alberta

/ Dossier 125142

ernal ☐ External / Externe

I

☒ Information

☐ Decision / Approval
Décision / Approbation

Other / Autre reply

For / Pour

☐ Minister / Ministre

☒ Deputy Minister / Sous-ministre

☐ Associate DM
Sous-ministre déléguée

Other / Autre

Sector / Secteur

Energy

Contact:
(name/nom - tel.)

Annette Tobin

Due Date /
Échéance October 7, 2011

Subject / Objet

California's Low Carbon Fuel Standard

Priority / Priorité

(If urgent, state reason /deadline – Si urgent, donner la raison / date limite)

Sector Consulted – Secteur consulté

- ☒ AECL Restructuring / Restructuration d'EACL
- ☐ Audit Branch / Direction de la vérification
- ☐ Canadian Forest Service / Service canadien des forêts
- ☐ Corporate Mgt and Services / Secteur de la gestion et des services intégrés
- ☐ Earth Sciences Sector / Secteur des sciences de la Terre
- ☐ Energy Sector / Secteur de l'énergie
- ☐ Innovation and Energy Technology Sector / Secteur de l'innovation et de la technologie énergétique

Other / Autre

- ☐ Legal Services / Services juridiques
- ☐ Major Projects Mgt Office /Bureau de gestion des grands projets
- ☐ Minerals and Metals Sector / Secteur des minéraux et des métaux
- ☐ Northern Pipeline Agency / Administration du pipe-line du Nord
- ☐ Public Affairs and Portfolio Mgt Sector / Secteur de la gestion des affaires publiques et du portefeuille
- ☐ Science and Policy Integration / Intégration des sciences et des politiques

Approval – Approbation

Signature

Date

Director / Directeur	<i>Donna Heath</i>	Oct 4, 2011
Director General / Directeur général	<i>Pauline</i>	Oct 10, 2011
Assistant DM / Sous-ministre adjoint		
Comments / Commentaires		



OCT 13 2011

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N11-125216

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MEMORANDUM TO THE DEPUTY MINISTER

OCT 13 2011

c.c.: Dale Eisler, ADM, ESPS

**PAYMENTS TO GOVERNMENTS
BY THE ENERGY SECTOR**

(Information by October 14, 2011)

SUMMARY

- This note is to provide you with a summary of recent payments to governments in the form of corporate income taxes, Crown royalties and land bonuses by the various segments of the energy sector (see Attachment 1).
- It also reports on projections of future payments by the upstream oil and gas industry, including the oil sands, over the next five years developed by ARC Financial and the Canadian Energy Research Institute.

OCT 14 2011

Mark Corey

Attachment: (1)

Contact: James Zeni, 613-992-6780
Energy Policy Branch, ES

Mark
Thank you. I am
from the presentation
that we must not
rely on CERI for
this measure (e.g.,
given use of 2006 tax
rates, in ...)

000218

Payments to governments by the Energy Sector (ES)

Over the last five years, annual payments to governments by the oil and gas extraction industry have averaged more than \$22 billion (B).

- The oil and gas extraction industry is the largest contributor to total corporate taxes payable by the ES, paying more than \$4.3B or 61 percent in 2009.
- The oil and gas extraction industry also pays a substantial amount in Crown royalties and land bonuses to governments: \$15.2B in 2010, up 42 percent from the \$10.7B it paid in 2009, but below the record high reached in 2008 of \$25.4B.

Crown royalty regimes differ between conventional oil and gas development (which are usually based on gross revenues before the deduction of costs) and offshore projects and oil sands (which initially are set at a low rate on gross revenues but which then increase to a higher percentage of net revenues once project costs are recovered).

- The bulk of Crown royalties are currently paid by the conventional oil and gas sector. Royalty payments by oil sands producers are expected to increase as more projects reach pay-out.
- In 2010, Alberta received more than 40 percent of total Crown royalties paid, followed by Newfoundland and Labrador and Saskatchewan.

The ES share of total corporate income taxes paid in a given year is roughly in line with its share of total operating revenues in Canada.

- Corporate income tax rates in Canada have been decreasing since 2000 and are legislated federally to continue to do so through to 2012.
- Like other industries, income tax paid by the ES fluctuates based on profits. The sector is highly capital intensive (with more than 20 percent of total private and public capital investments in Canada). Thus corporate income taxes paid by the sector vary as a result of capital cost allowance deductions.

ARC Financial estimates that total payments to governments by upstream oil and gas companies will increase over the next five years, due solely to increasing Crown royalty payments as corporate income taxes decline slightly. (It is important to note that the estimate by ARC Financial is based on a smaller subset of oil and gas companies than that reported by Statistics Canada).

Canadian Energy Research Institute (CERI), on the other hand, shows large increases in both corporate income taxes and Crown royalty payments for oil sands. CERI's forecasts for tax

revenues and royalties assume that the applicable rules and rates from 2006 remain in effect throughout the forecast period. As noted above, federal corporate tax rates have declined from 23 percent in 2006 to 16.5 percent currently and will decrease to 15 percent in 2012. In addition, CERI's estimates include corporate income tax payable by companies indirectly supporting the oil sands.

ES: Payments to governments
(\$ Millions)

	2005	2006	2007	2008	2009
Oil and gas extraction and support activities					
Operating revenues	139,018	155,311	168,355	209,225	134,199
Federal income tax	2,644	3,641	2,307	3,101	2,747
Provincial/territorial income tax	1,167	1,543	1,006	1,722	1,559
Total income tax	3,811	5,184	3,313	4,823	4,306
Conventional oil and gas Crown royalties	13,610	11,126	11,732	15,319	6,856
Oil sands Crown royalties	799	2,139	1,864	3,514	1,911
Total Crown royalties ¹	14,409	13,265	13,596	18,833	8,767
Conventional oil and gas Crown land sales	2,599	2,435	2,810	6,280	1,940
Oil sands Crown land sales	433	1,963	650	288	10
Total Crown land sales ¹	3,032	4,398	3,460	6,568	1,950
Total income tax and other Crown payments	21,252	22,847	20,369	30,224	15,023
Petroleum and coal products manufacturing					
Operating revenues	83,845	82,727	88,249	109,733	84,373
Federal income tax	1,597	2,089	1,527	1,258	1,017
Provincial/territorial income tax	725	878	746	747	597
Total income tax	2,322	2,967	2,274	2,005	1,615
Utilities (includes electricity & NG distribution)					
Operating revenues	95,552	99,604	103,899	116,612	97,785
Federal income tax	351	336	330	308	357
Provincial/territorial income tax	189	192	191	186	208
Total income tax	539	528	522	493	565

Projections of Future Payments to governments
(**\$ Millions**)

Upstream Oil and Gas (ARC Financial–April 2011)

ARC Financial estimates the payments to governments made by exploration and production companies, but excludes oilfield service companies and other support services. These projections are for both conventional oil and gas and oil sands activities.

	2010E	2011E	2012E	2013E	2014E	2015E
Operating revenues	100,08	115,03	120,03	122,93	124,93	128,06
	6	3	9	7	1	6
Conventional oil and natural gas	62,943	68,930	69,785	69,348	68,699	69,326
Oil sands	37,143	46,103	50,253	53,589	56,232	58,740
Federal income tax	2,762	2,736	2,538	2,454	2,455	2,439
Provincial/territorial income tax	1,524	1,481	1,642	1,611	1,612	1,551
Total income tax	4,286	4,217	4,180	4,065	4,067	3,990
Crown royalties	11,219 ²	13,552	14,454	14,778	14,910	15,274
Crown land sales	3,957 ²	2,781	2,578	2,646	2,747	2,884
Total Payments to Governments	19,462	20,550	21,212	21,489	21,724	22,148

Oil Sands (CERI–June 2011)

CERI estimates the total income taxes paid by all corporations that are both directly and indirectly associated with future oil sands development.

Note that these estimates are much higher than the ARC Financial forecasts above (even though the ARC Financial numbers include both conventional and oil sands). The CERI forecasts are based on the fiscal regime of 2006, when the federal corporate income tax rate was 23 percent. The current federal corporate income tax rate is 16.5 percent and will decrease to 15 percent in 2012. CERI also includes companies indirectly associated with the oil sands in its forecast.

	2010E	2011E	2012E	2013E	2014E	2015E
Corporate income taxes	2,254	2,406	2,654	2,945	3,163	3,368
Alberta royalties	3,567	4,032	5,390	6,680	8,237	11,102
Total	5,821	6,438	8,044	9,625	11,400	14,470

² Actual 2010–CAPP Statistical Handbook/Statistics Canada

Pipelines					
Operating revenues	39,985	36,495	41,112	46,566	44,333
Federal income tax	436	450	565	421	312
Provincial/territorial income tax	229	226	276	223	181
Total income tax	665	676	841	645	493
Total energy sector					
Operating revenues	358,400	374,137	401,615	482,136	360,690
Energy sector share of all industries	12.5%	12.4%	12.7%	14.5%	11.9%
Federal income tax	5,028	6,516	4,729	5,088	4,433
Provincial/territorial income tax	2,310	2,839	2,219	2,878	2,545
Total income tax	7,337	9,355	6,950	7,966	6,978
Energy sector share of all industries	15.5%	16.9%	13.0%	15.1%	13.5%
Crown royalties and land sales ¹	17,441	17,663	17,056	25,401	10,717
Total corporate taxes, royalties and land sales	24,778	27,018	24,006	33,367	17,695

Source: Statistics Canada, Financial and Taxation Statistics for Enterprises, 2009

¹ Payments paid by oil and gas exploration companies to governments for the right to explore and extract the resource on Crown lands. Amounts do not include land bonuses or royalties paid to private freehold land owners (approximately 15 percent of total royalties and land sales paid annually by oil and gas companies).



N11-125216

MEMORANDUM TO THE DEPUTY MINISTER

OCT 13 2011

c.c.: Dale Eisler, ADM, ESPS

**PAYMENTS TO GOVERNMENTS
BY THE ENERGY SECTOR**

(Information by October 14, 2011)

SUMMARY

- This note is to provide you with a summary of recent payments to governments in the form of corporate income taxes, Crown royalties and land bonuses by the various segments of the energy sector (see Attachment 1).
- It also reports on projections of future payments by the upstream oil and gas industry, including the oil sands, over the next five years developed by ARC Financial and the Canadian Energy Research Institute.

Mark Corey

Attachment: (1)

Contact: James Zeni, 613-992-6780
Energy Policy Branch, ES



HQRO-PA

JAN - 3 2012

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JAN 9 2012

N11-126176

EX1480-1

JAN 03 2012

MEMORANDUM TO THE DEPUTY MINISTER

TRENDS IN CANADIAN CRUDE OIL IMPORTS

(Information by January 6, 2012)

SUMMARY

- The purpose of this note is to provide information on trends in Canadian crude oil imports and analysis of the energy security implications.
- Canada is becoming less dependent on crude oil imports due to rising domestic oil sands production and decreased domestic demand. Measured by volume, Canadian crude oil imports have declined by 16 percent since 2005.
- North Sea crude oil imports, which represented 58 percent of Canada's crude oil imports in 2000, fell to just 22 percent by 2010. At the same time, the Organization of Petroleum Exporting Countries' (OPEC) share of total imports by Canada grew from 33 to 49 percent.
- Eastern Canada's reliance on OPEC crude oil imports may increase the region's vulnerability to supply disruption due to instability in OPEC member states. However, this risk could be partly mitigated as more Western Canadian crude enters the Eastern Canadian market. Note that Enbridge has proposed a reversal of its Line 9 pipeline (see details below).
- Not all crude oil imported into Eastern Canada is used for domestic consumption as Eastern Canadian refineries are significant exporters as well. For example, more than [REDACTED]
- Natural Resources Canada (NRCan) will continue to monitor trends in oil markets and keep you apprised of any developments that may impact Canada's energy security.

s.20(1)(b)

s.20(1)(c)

BACKGROUND

Declining Crude Oil Imports

Currently, of the 1.8 million b/d (Mb/d) of crude oil processed in Canada, 44 percent is imported. However, with rising domestic crude oil production and decreased demand, Canada is becoming less dependent on crude oil imports. Canada's crude oil imports averaged 929 thousand b/d (Kb/d) in 2005, but have since fallen to 777 Kb/d in 2010—a 16-percent decline.

Canada's crude oil supply is growing significantly, driven by increased oilsands production. Oilsands production averaged 610 kb/d in 2000 and reached 1.5 mb/d in 2010¹. Production from Canada's oil sands is expected to increase substantially by 2020.

Changing Source of Crude Oil Imports

Between 2000 and 2010, North Sea crude oil imports (Norway and the United Kingdom [U.K.]) declined from 58 to 22 percent of Canada's crude oil imports², and this trend is expected to continue. (A table showing Canada's crude oil imports, by country, for the 2000 to 2010 period is provided under Attachment 1.)

As North Sea crude oil imports decline, the percentage of Canadian crude oil imports from OPEC member countries has been rising. Between 2000 and 2010, OPEC's share of Canada's crude oil imports grew from 33 to 49 percent (see Attachment 2 for graphic comparison.) Since 2008, Algeria (an OPEC member) has supplied the largest volume of crude oil imports into Canada.

In 2010, Algeria, the U.K., Nigeria, Norway and Saudi Arabia were the largest suppliers of crude oil to Canada. Over the 2000 to 2010 period, the highest growth rates in Canada's oil imports came from African OPEC member countries. Canada's oil imports from Angola increased from 5 Kb/d in 2000, to 60 Kb/d in 2010 (an 1,100 percent increase), followed by Nigeria from 21 Kb/d in 2000 to 74 Kb/d in 2010 (a 252 percent increase). Canada's oil imports from Algeria increased from 74 Kb/d in 2000, to 113 Kb/d in 2010 – a 52-percent increase (see Attachment 1.)

¹ Statistics Canada, Energy Statistics Handbook, 2nd Quarter 2011, Crude Oil and Equivalent Production by Type, Table 4.2-2, Published September 30, 2011.

² Source: International Energy Agency, Norway and United Kingdom oil production has declined from the 6.05 Mb/d in 2000 to 3.54 Mb/d in 2010.



N11-126176

JAN 03 2012

MEMORANDUM TO THE DEPUTY MINISTER

TRENDS IN CANADIAN CRUDE OIL IMPORTS

(Information by January 6, 2012)

SUMMARY

- The purpose of this note is to provide information on trends in Canadian crude oil imports and analysis of the energy security implications.
- Canada is becoming less dependent on crude oil imports due to rising domestic oil sands production and decreased domestic demand. Measured by volume, Canadian crude oil imports have declined by 16 percent since 2005.
- North Sea crude oil imports, which represented 58 percent of Canada's crude oil imports in 2000, fell to just 22 percent by 2010. At the same time, the Organization of Petroleum Exporting Countries' (OPEC) share of total imports by Canada grew from 33 to 49 percent.
- Eastern Canada's reliance on OPEC crude oil imports may increase the region's vulnerability to supply disruption due to instability in OPEC member states. However, this risk could be partly mitigated as more Western Canadian crude enters the Eastern Canadian market. Note that Enbridge has proposed a reversal of its Line 9 pipeline (see details below).
- Not all crude oil imported into Eastern Canada is used for domestic consumption as Eastern Canadian refineries are significant exporters as well. For example, more than [REDACTED]
- Natural Resources Canada (NRCan) will continue to monitor trends in oil markets and keep you apprised of any developments that may impact Canada's energy security.

s.20(1)(b)

s.20(1)(c)

BACKGROUND

Declining Crude Oil Imports

Currently, of the 1.8 million b/d (Mb/d) of crude oil processed in Canada, 44 percent is imported. However, with rising domestic crude oil production and decreased demand, Canada is becoming less dependent on crude oil imports. Canada's crude oil imports averaged 929 thousand b/d (Kb/d) in 2005, but have since fallen to 777 Kb/d in 2010—a 16-percent decline.

Canada's crude oil supply is growing significantly, driven by increased oilsands production. Oilsands production averaged 610 kb/d in 2000 and reached 1.5 mb/d in 2010¹. Production from Canada's oil sands is expected to increase substantially by 2020.

Changing Source of Crude Oil Imports

Between 2000 and 2010, North Sea crude oil imports (Norway and the United Kingdom [U.K.]) declined from 58 to 22 percent of Canada's crude oil imports², and this trend is expected to continue. (A table showing Canada's crude oil imports, by country, for the 2000 to 2010 period is provided under Attachment 1.)

As North Sea crude oil imports decline, the percentage of Canadian crude oil imports from OPEC member countries has been rising. Between 2000 and 2010, OPEC's share of Canada's crude oil imports grew from 33 to 49 percent (see Attachment 2 for graphic comparison.) Since 2008, Algeria (an OPEC member) has supplied the largest volume of crude oil imports into Canada.

In 2010, Algeria, the U.K., Nigeria, Norway and Saudi Arabia were the largest suppliers of crude oil to Canada. Over the 2000 to 2010 period, the highest growth rates in Canada's oil imports came from African OPEC member countries. Canada's oil imports from Angola increased from 5 Kb/d in 2000, to 60 Kb/d in 2010 (an 1,100 percent increase), followed by Nigeria from 21 Kb/d in 2000 to 74 Kb/d in 2010 (a 252 percent increase). Canada's oil imports from Algeria increased from 74 Kb/d in 2000, to 113 Kb/d in 2010 – a 52-percent increase (see Attachment 1.)

¹ Statistics Canada, Energy Statistics Handbook, 2nd Quarter 2011, Crude Oil and Equivalent Production by Type, Table 4.2-2, Published September 30, 2011.

² Source: International Energy Agency, Norway and United Kingdom oil production has declined from the 6.05 Mb/d in 2000 to 3.54 Mb/d in 2010.

CONSIDERATIONS

Energy Security Implications

Western Canadian provinces do not generally import crude oil as they have access to lower priced domestic crude supplies. For economic reasons, Eastern Canada uses both domestic and imported crude. As reliance on OPEC crude oil imports grows, the risk of a crude oil supply disruption may increase due to higher incidents of civil unrest and political instability in some OPEC member states.

In 2011, civil unrest in some OPEC member states threatened and/or impacted global oil supply. Canada saw much higher Brent prices as a result of disrupted supplies. In 2011, the West Texas Intermediate (WTI)-Brent differential widened, due to record high inventories in the U.S. Midwest market, where the WTI price is established. Most Canadian crude oil trades at prices which track the WTI. In 2011, a disruption in Libyan crude exports pushed the price of Brent crude oil up and this also contributed to the wide WTI-Brent crude oil differential.

Factors Mitigating Risk

Line 9 Reversal

There is potential for western crude to reach further east if Enbridge's Line 9, also called the Sarnia-to-Montréal crude oil pipeline, is reversed to flow from west to east. At present, Canadian domestic crude oil production meets the needs of the four western provinces and more than three-quarters of Ontario's refinery capacity. In August 2011, Enbridge applied to the National Energy Board (NEB) for a partial reversal of Line 9 (from Sarnia to Westover, Ontario). From Westover, western Canadian crude oil can be supplied to Imperial Oil's Nanticoke refinery in Ontario. The proposed in-service date for this pipeline reversal will be set following the public hearing.

s.20(1)(b)

s.20(1)(c)

s.21(1)(b)

Eastern Canadian Refined Product Exports

Not all crude imported into Eastern Canada is used for domestic consumption. Eastern Canadian refineries are significant exporters; in 2010, 419 Kb/d of refined petroleum product was exported to the U.S.

s.20(1)(b)

s.20(1)(c)



CONCLUSION

NRCan will continue to monitor trends in oil markets and keep you apprised of any developments that may impact Canada's energy security.

A handwritten signature in black ink, appearing to read 'Mark Corey', is written over a horizontal line.

Mark Corey

Attachments: (2)

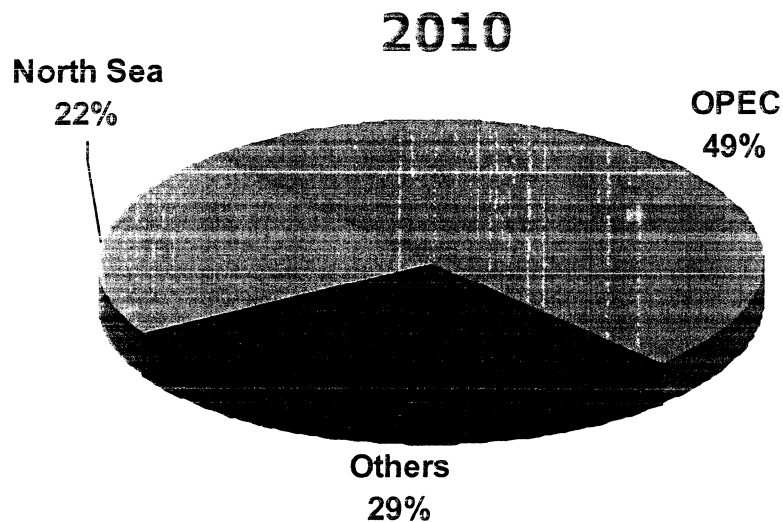
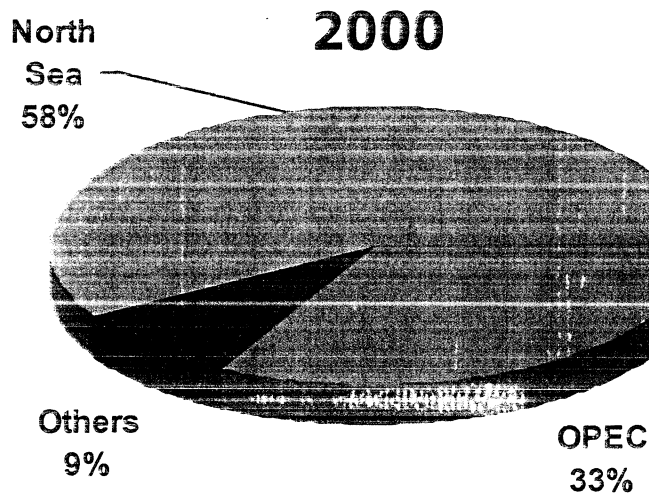
Contact: Jeff Labonté, 613-992-8609
Petroleum Resources Branch, ES

Canadian Crude Oil Imports by Country
(Thousand Barrels Per Day)

	2000	2005- 2010 Increase or Decrease	2005	2005- 2010 Increase or Decrease	2010	2000- 2010 Increase or Decrease
United States	23	-9%	21	-43%	12	-48%
Russia	12	83%	22	-18%	18	50%
Mexico	27	37%	37	-30%	26	-4%
Venezuela	91	-47%	48	-44%	27	-70%
Iraq	47	40%	66	-39%	40	-15%
Angola	5	220%	16	+275%	60	1100%
Saudi Arabia	58	31%	76	-9%	69	19%
Norway	265	-9%	241	-70%	72	-73%
Nigeria	21	19%	25	+196%	74	252%
United Kingdom	268	-46%	146	-34%	97	-64%
Algeria	74	120%	163	-31%	113	53%
All Others	14	386%	68	+149%	169	1107%

Source: Statistics Canada, Energy Statistics Handbook, Crude Oil and Equivalent Imports by Country of Origin, Second Quarter 2011, Published September 30, 2011.

Canada's Crude Oil Imports 2000 versus 2010



**Declining North Sea Crude Oil Imports Have Been Replaced by OPEC
and Other Crude Oil Imports**

Source: Statistics Canada, Energy Statistics Handbook, Second Quarter 2011

Page(s) 000232 to / à 000237

**is (are) excluded pursuant to section(s)
est(sont) exclue(s) en vertu de(s)(l')article(s)**

69(1)(g) re: re: (a)(c)

**of the Access to Information
Loi sur l'accès à l'information**



N11-126813

DEC - 8 2011

MEMORANDUM TO THE DEPUTY MINISTER

c.c.: Brian Gray, ADM, ESS
Tom Rosser, ADM, CFS
Geoff Munro, ADM, IETS

**UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE'S
IN-DEPTH REVIEW OF CANADA'S
FIFTH NATIONAL COMMUNICATION'S REPORT**

(For Information)

SUMMARY

- On February 12, 2010, Canada submitted its fifth National Communications Report (NC5), which outlines steps being taken to implement its commitments under the United Nations Framework Convention on Climate Change (UNFCCC).
- The UNFCCC Secretariat published a review of this report on November 10, 2011. The review was prepared by a team of experts, following an in-depth review conducted in Ottawa in May 2011. Officials from Natural Resources Canada (NRCan) participated in the review process.
- The review report concludes that Canada has fulfilled all mandatory reporting requirements under the UNFCCC and the *Kyoto Protocol*. However, concern was expressed that Canada may not meet its Copenhagen Accord commitments, and "could potentially become non-compliant" with its emissions reduction obligation under the *Kyoto Protocol*.

BACKGROUND

As a developed country, Canada is required to prepare a report every four years, outlining the steps it is taking to implement its commitments under the UNFCCC and the *Kyoto Protocol*. Canada submitted its NC5 on February 12, 2010. Preparation of Canada's NC5 was led by Environment Canada (EC), with input from a number of other departments, including NRCan.

The report focuses on the following six areas:

- National circumstances that effect greenhouse gas trends;
- Policies and measures being implemented to address climate change;
- Greenhouse gas inventory and emissions projections;
- Climate research and systematic observation;
- Implementation of adaptation measures; and
- Support provided to developing countries to address climate change.

Following the submission of a National Communication's Report, the UNFCCC conducts an in-depth review (see Attachment 1) to assess compliance with UNFCCC commitments, and completeness and accuracy of reporting. The in-depth review of Canada's NC5 took place in Ottawa on May 16–21, 2011. The review was conducted by a visiting expert review team of four officials from other countries, supported by an official from the UNFCCC Secretariat. The review consisted of a series of presentations and discussions with Canadian government officials.

EC coordinated Canada's participation in the review. NRCan, together with a number of other departments, delivered presentations and addressed questions from the expert review team. In particular, NRCan provided an overview of: policies and measures in the energy and forestry sectors; technology development and transfer; and adaptation measures.

CONSIDERATIONS

The review concludes that the information provided in Canada's NC5 meets the mandatory reporting requirements, and that Canada provided additional information during the review that improved the initial report. The review outlines a number of detailed recommendations for Canada to take into consideration during the preparation of future National Communications Reports, including a recommendation to move beyond "bare minimum" reporting and provide additional detail on policies and measures in all sectors.

During the review, NRCan led the presentation outlining Canada's climate change impacts, vulnerability and adaptation measures. This area was singled out by the UNFCCC as particularly impressive. In particular, they "commend Canada for its well-organized and systematic approach to identifying climate change impacts and adaptation measures." They also note that "significant progress has been made in Canadian scientific research and the understanding of the continuing impacts of climate change" since Canada's previous National Communications Report.

The review finds that based on available data, there is a risk that Canada could be found non-compliant with its emissions reduction obligation under the *Kyoto Protocol*. It also indicates that, during the review, Canada did not demonstrate that implemented or planned measures would be sufficient to reach its Copenhagen Accord target of reducing emissions by 17 percent compared to 2005 levels, by 2020. They also assert that changes in Canada's policy framework have significantly slowed down mitigation action in Canada, and have resulted in a number of planned policies and measures not being implemented. The review makes particular reference to Canada's failure to implement regulations contained in the 2007 *Turning the Corner* climate change plan. These findings are likely to generate media interest and public criticism, particularly in the context of COP17, which is taking place in South Africa in November–December 2011.

As lead of the NC5 preparation and review process, EC has prepared a communications advisory note for the Minister of the Environment, to address media interest and criticism that may arise from the publication of the UNFCCC review (see Attachment 2).

Key messages include the following:

- the Government of Canada is committed to accountability and transparency through reporting;
- federal and provincial/territorial measures have brought Canada 25 percent of the way towards meeting its *Copenhagen Accord* target; and
- under the *Kyoto Protocol*, compliance with commitments is not determined until after the end of the first commitment period in 2013.

CONCLUSION

NRCan officials played an important role in the UNFCCC review of Canada's approach to addressing climate change. EC will address communications issues arising from the release of the report. Given NRCan's role in the review process, the department will continue to monitor developments on this issue.



Mark Corey

Attachments: (2)

Contact: Sally Garden, 613-944-6158
Energy Policy Branch, ES



COMPLIANCE COMMITTEE

CC/ERT/2011/25
10 November 2011

Report of the in-depth review of the fifth national communication of Canada

Note by the secretariat

The report of the in-depth review of the fifth national communication of Canada was published on 10 November 2011. For purposes of rule 10, paragraph 2, of the rules of procedure of the Compliance Committee (annex to decision 4/CMP.2, as amended by decision 4/CMP.4), the report is considered received by the secretariat on the same date. This report, FCCC/IDR.5/CAN, contained in the annex to this note, is being forwarded to the Compliance Committee in accordance with section VI, paragraph 3, of the annex to decision 27/CMP.1.



United Nations

FCCC/IDR.5/CAN



Framework Convention on Climate Change

Distr.: General
10 November 2011

English only

Report of the in-depth review of the fifth national communication of Canada

Parties included in Annex I to the Convention are requested, in accordance with decision 10/CP.13, to submit a fifth national communication to the secretariat by 1 January 2010. In accordance with decision 8/CMP.3, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol shall include in their fifth national communications supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. In accordance with decision 15/CMP.1, these Parties shall start reporting the information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention for the first year of the commitment period. This includes supplementary information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol. This report presents the results of the in-depth review of the fifth national communication of Canada conducted by an expert review team in accordance with the relevant provisions of the Convention and Article 8 of the Kyoto Protocol.

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I. Introduction and summary

A. Introduction

1. For Canada, the Convention entered into force on 21 March 1994 and the Kyoto Protocol on 16 February 2005. Under the Kyoto Protocol, Canada committed itself to reducing its greenhouse gas (GHG) emissions by 6 per cent compared with the base year¹ level during the first commitment period from 2008 to 2012.
2. This report covers the in-country in-depth review (IDR) of the fifth national communication (NC5) of Canada, coordinated by the UNFCCC secretariat, in accordance with the guidelines for review under Article 8 of the Kyoto Protocol (decision 22/CMP.1). The review took place from 16 to 21 of May 2011 in Ottawa, Canada, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Mr. Amit Garg (India), Mr. Niklas Höhne (Germany), Ms. Suvi Monni (Finland) and Mr. Eric Mugurusi (United Republic of Tanzania). Mr. Garg and Mr. Höhne were the lead reviewers. The review was coordinated by Ms. Barbara Muik (UNFCCC secretariat).
3. During the IDR, the expert review team (ERT) examined each section of the NC5. The ERT also evaluated the supplementary information provided by Canada as a part of the NC5 in accordance with Article 7, paragraph 2, of the Kyoto Protocol. In addition, the ERT reviewed the information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, which was provided by Canada in its 2010 annual submission and elaborated on further in its 2011 annual submission under Article 7, paragraph 1, of the Kyoto Protocol.
4. In accordance with decision 22/CMP.1, a draft version of this report was communicated to the Government of Canada, which provided comments that were considered and incorporated, as appropriate, in this final version of the report.

B. Summary

5. The ERT noted that Canada's NC5 complies in general with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications" (hereinafter referred to as the UNFCCC reporting guidelines). As required by decision 15/CMP.1, supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol² is provided in the NC5. Canada considered most recommendations provided in the review report of the fourth national communication of Canada.³ The ERT commended Canada for its improved reporting in many sections.
6. The supplementary information on the minimization of adverse impacts referred to in paragraph 3 above was generally complete and broadly transparent and was provided on time. During the review, Canada provided further relevant information.

¹ "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for all gases. The base year emissions include emissions from sectors/source categories listed in Annex A to the Kyoto Protocol.

² Decision 15/CMP.1, annex, chapter II.

³ FCCC/IDR.4/CAN.

1. Completeness

7. The NC5 covers all sections required by the UNFCCC reporting guidelines, and most of the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol, except for information on complementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 (see para. 90); information on its domestic and regional legislative arrangements and enforcement and administrative procedures established pursuant to the implementation of the Kyoto Protocol (see para. 32); and a description of legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraph 3, and elected activities under Article 3, paragraph 4, also contribute to the conservation of biodiversity and the sustainable use of natural resources (see para. 19). The NC5 does not include some information required by the UNFCCC reporting guidelines on national circumstances for the agriculture and forestry sectors (see para. 11); on policies and measures (PaMs) in tabular format by gas; PaMs in agriculture, forestry and waste sectors both in textual and tabular formats (see para. 26); information on how Canada believes its PaMs are modifying longer term trends in anthropogenic GHG emissions (see para. 27); projections on a sectoral and gas-by-gas basis; relevant information on factors and activities by sector for the years 1990–2020 (see para. 75); and a clear distinction between activities related to technology transfer undertaken by the public sector and those undertaken by the private sector (see para. 105). Further relevant information on these elements was provided by Canada during the review. The ERT recommends that Canada enhance the completeness of its reporting by providing this information in its next national communication.

2. Transparency

8. The ERT acknowledged that Canada's NC5, including supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol is broadly transparent. The NC5, together with the additional information and documents provided during the review, provide clear information on most aspects of the implementation of the Convention and its Kyoto Protocol. The ERT noted that the NC5 is structured following the outline contained in the annex to the UNFCCC reporting guidelines and supplementary information submitted under Article 7, paragraph 2, of the Kyoto Protocol is identifiable. In the course of the review, the ERT formulated a number of recommendations that could help Canada to further increase the transparency of its reporting with regard to PaMs (see para. 28), projections and total effects of PaMs (see para. 85), and financial resources and technology transfer (see para. 105).

3. Timeliness

9. The NC5 was submitted on 12 February 2010, after the deadline of 1 January 2010 mandated by decision 10/CP.13. Canada informed the secretariat about its difficulties with the timeliness of its national communication submission in accordance with decision 22/CMP.1, paragraph 139. The ERT noted with concern the delay in the submission of the NC5.

II. Technical assessment of the reviewed elements

A. National circumstances relevant to greenhouse gas emissions and removals, including legislative arrangements and administrative procedures

10. In its NC5, Canada has provided a concise description of its national circumstances, and has elaborated on the framework legislations and key policy documents on climate change. The NC5 also referred to the description of a national system provided in the national inventory report of the 2009 annual submission. Further technical assessment of the institutional and legislative arrangements for the coordination and implementation of PaMs are provided in chapter II.B.I of this report.

1. National circumstances

11. In its NC5, Canada has provided a description of its national circumstances, and information on how these national circumstances affect GHG emissions in Canada and how changes in national circumstances affect GHG emissions over time. However, the ERT noted that Canada did not provide the following reporting elements required by UNFCCC reporting guidelines: a description of its national circumstances for the agriculture and forestry sectors, how these national circumstances affect GHG emissions and removals in Canada, and how national circumstances and changes in national circumstances affect GHG removals over time. Information on these areas was provided by Canada during the review. The ERT recommends that Canada elaborate further on its national circumstances by including the above mentioned sectoral information in its next national communication.

12. The ERT notes that historically the main drivers of emission trends in Canada include population increase mainly due to immigration, a strong growth in energy production for exports, including the upstream oil and gas industry (mainly oil from oil sands, the production of which is more energy intensive than that from conventional sources) and heavy oil and bitumen upgrading and increasing road transport levels. In addition, annual variations in precipitation and temperature affected emission levels. The economy of Canada is dominated by primary industry, for example, mining, and energy intensive industrial sectors. Also, Canada is a major exporter of energy, mainly to the United States of America. Altogether, this leads to very high per capita emissions, albeit 78 per cent of Canada's electricity is produced by non-GHG emitting sources, and on this indicator, Canada ranks among the top of industrialized countries.

13. To explain how its national circumstances are relevant to factors affecting GHG emissions, the ERT encourages Canada to report in more detail on per capita trends such as energy consumption and production, electricity consumption, GHG emissions and gross domestic product (GDP); and on energy intensity of the economy (i.e. total primary energy supply (TPES) per GDP) and the GHG intensity of TPES. The ERT also encourages Canada to provide a comparison with disaggregated indicators of other Parties with similar national circumstances to improve the transparency of reporting and to enhance understanding of the impacts of Canada's national circumstances on its GHG emissions. Table 1 illustrates the national circumstances of the country by providing some indicators relevant to GHG emissions and removals.

14. Canada is a parliamentary democracy with a federal structure, consisting of provinces and territories. The Constitution Act of 1867 sets out federal and provincial legislative authorities. The Federal Government may legislate and regulate with respect to the environment, including climate change issues, but it must be linked to an appropriate constitutional federal head of power. The overall responsibility for climate change

policymaking lies with Environment Canada and a number of ministries and national institutions are involved in the implementation of the climate policy. The Kyoto Protocol Implementation Act (KPIA) expresses the will of the Parliament in 2007 that the Government proceed to implement the Kyoto Protocol. Federal, provincial and municipal levels share jurisdiction for implementing a significant part of the PaMs. Further legislative arrangements and administrative procedures, including those for the national system and the national registry are presented in chapters II.A.2, II.A.3 and II.B.

15. Canada has provided a summary of information on GHG emission trends for the period 1990–2007. This information is consistent with the 2009 national GHG inventory submission. Summary tables, including trend tables for emissions of carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) (given in the common reporting format), are also provided in an annex to the NC5 as required by the UNFCCC reporting guidelines with the exception of that for CO₂ eq. During the review, the ERT assessed the emissions data from the Party's recently submitted 2011 annual submission and has reflected the findings in this report.

Table I
Indicators relevant to greenhouse gas emissions and removals for Canada

	1990	1995	2000	2005	2008	Change 1990–2000 (%)	Change 2000–2008 (%)	Change 1990–2008 (%)
Population (million)	27.69	29.30	30.69	32.25	33.33	10.8	8.6	20.4
GDP (USD 2 000 billion using PPP)	655.51	713.88	874.08	991.07	1 049.49	33.3	20.1	60.1
TPES (Mtoe)	208.68	230.91	251.44	272.34	267.24	20.5	6.3	28.1
GDP per capita (USD 2 000 thousand using PPP)	23.67	24.36	28.48	30.73	31.49	20.3	10.6	33.0
TPES per capita (toe)	7.54	7.88	8.19	8.44	8.02	8.6	–2.1	6.4
GHG emissions without LULUCF (Tg CO ₂ eq)	590.42	639.61	716.09	731.44	731.73	21.3	2.2	23.9
GHG emissions with LULUCF (Tg CO ₂ eq)	522.93	825.58	653.98	784.97	714.78	25.1	9.3	36.7
CO ₂ emissions per capita (Mg)	16.56	16.76	18.34	17.78	17.32	10.7	–5.6	4.6
CO ₂ emissions per GDP unit (kg per USD 2 000 using PPP)	0.70	0.69	0.64	0.58	0.55	–8.6	–14.1	–21.4
GHG emissions per capita (Mg CO ₂ eq)	21.32	21.83	23.33	22.68	21.95	9.4	–5.9	3.0
GHG emissions per GDP unit (kg CO ₂ eq per USD 2 000 using PPP)	0.90	0.90	0.82	0.74	0.70	–8.9	–14.6	–22.2

Sources: (1) GHG emissions data: Canada's 2011 greenhouse gas inventory submission; (2) Population, GDP and TPES data: International Energy Agency.

Note: The ratios per capita and per GDP unit are calculated relative to GHG emissions without LULUCF; the ratios are calculated using the exact (not rounded) values and may therefore differ from a ratio calculated with the rounded numbers provided in the table.

Abbreviations: GDP = gross domestic product, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, PPP = purchasing power parity, TPES = total primary energy supply.

16. Total GHG emissions excluding emissions and removals from land use, land-use change and forestry (LULUCF) increased by 16.9 per cent between the base year and 2009, whereas total GHG emissions including net emissions or removals from LULUCF increased by 29.6 per cent over this period. This was attributed mainly to CO₂ emissions,

which had increased by 18.2 per cent. Emissions of CH₄ also increased by 26.6 per cent, while emissions of N₂O decreased by 3.8 per cent. Emissions of fluorinated gases accounted for about 1.8 per cent of total GHG emissions in 1990 and 1.4 per cent in 2009. Trends of total GHG emissions were mostly underpinned by GHG emission trends in fossil fuel industries (coal-mining and the production, transmission, processing, refining and distribution of all oil and gas products, in particular oil sands mining, extraction and upgrading activities) (+55 Tg) and in road transportation (in particular light-duty gasoline trucks) (+35 Tg). Analysis of drivers for GHG emission trends in each sector is provided in chapter II.B. Table 2 provides an overview of GHG emissions by sector from the base year to 2009.

Table 2
Greenhouse gas emissions by sector in Canada, 1990–2009

Sector	GHG emissions (Tg CO ₂ eq)						Change (%)		Shares ^a by sector (%)	
							1990–	2008–	1990	2009
	1990	1995	2000	2005	2008	2009	2009	2009		
1. Energy	467.51	507.73	586.41	594.81	597.11	566.01	21.1	–5.2	79.2	82.0
A1. Energy industries	143.03	150.07	193.45	189.18	185.35	161.47	12.9	–12.9	24.2	23.4
A2. Manufacturing industries and construction	64.53	65.53	69.47	68.78	72.61	74.95	16.1	3.2	10.9	10.9
A3. Transport	146.12	160.16	179.86	192.99	196.10	190.06	30.1	–3.1	24.7	27.5
A4.–A5. Other	71.75	76.33	80.62	80.72	80.76	78.84	9.9	–2.4	12.2	11.4
B. Fugitive emissions	42.08	55.63	63.02	63.13	62.29	60.70	44.2	–2.6	7.1	8.8
2. Industrial processes	56.75	58.86	53.50	57.21	54.51	46.31	–18.4	–15.0	9.6	6.7
3. Solvent and other product use	0.18	0.21	0.25	0.18	0.34	0.26	45.8	–23.6	0.0	0.0
4. Agriculture	46.87	52.71	55.47	57.93	58.38	55.86	19.2	–4.3	7.9	8.1
5. LULUCF	–67.48	185.97	–62.11	53.53	–16.95	–12.10	–82.1	–28.6	–11.4	–1.8
6. Waste	19.11	20.09	20.46	21.30	21.39	21.61	13.1	1.0	3.2	3.1
7. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GHG total with LULUCF	522.93	825.58	653.98	784.97	714.78	677.95	29.6	–5.2	NA	NA
GHG total without LULUCF	590.42	639.61	716.09	731.44	731.73	690.05	16.9	–5.7	100.0	100.0

Note: The changes in emissions and the shares by sector are calculated using the exact (not rounded) values and may therefore differ from values calculated with the rounded numbers provided in the table.

Abbreviations: GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, NA = not applicable.

^a The shares of sectors are calculated relative to GHG emissions without LULUCF; for the LULUCF sector, the negative values indicate the share of GHG emissions that was offset by GHG removals through LULUCF.

17. Canada's GHG emissions rose steadily during 1990–2004, they declined marginally during 2004–2006, but increased again during 2006–2007. Since 2007, emissions have been declining mainly due to the global financial and economic crisis and its impact on Canada. Emissions from transport, the largest contributor to Canada's GHG emissions, have been increasing continuously since 1990, except for a decrease in 2008 and 2009, when emissions from both heavy-duty diesel on-road vehicles (for shipping), and off-road vehicles (for industry) fell, primarily as a result of reduced economic activity. The largest emission increase in transport can be observed in light-duty gasoline trucks or sport utility vehicles (SUVs) (21.05 Tg or a 104 per cent increase from the base year). Also, as presented by the Party during the review, GHG emissions from oil sand exploration mainly

for export, another strong contributor to Canada's GHG emission trend, has been increasing continuously (29 Tg or a 180 per cent increase from the base year). Together with emission increases from industries with intensive energy use these factors outweighed the decrease in other sectors and by far outweighed the effects of PaMs targeting energy efficiency and renewable energy.

2. National system

18. In accordance with decision 15/CMP.1, Canada provided in its NC5 a description of how its national system is performing the general and specific functions defined in the guidelines for national systems under Article 5, paragraph 1 (decision 19/CMP.1). The Party also provided a reference to the 2009 annual submission, which contains a more detailed description of the national system. The description includes all the elements as required in decision 15/CMP.1.

19. In the NC5, Canada did not report on national legislative arrangements and administrative procedures that seek to ensure that implementation of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol also contribute to the conservation of biodiversity and the sustainable use of natural resources. During the review, Canada presented information on such arrangements: the Greencover Canada Program and the Prairie Shelterbelt Program include incentives for conserving or enhancing the protection of biodiversity at the farm level; and the Canadian Boreal Initiative and the Federal Government's Habitat Conservation Program strategy contribute to the conservation of biodiversity in the forestry sector. The ERT recommends that Canada report information on the conservation of biodiversity and the sustainable use of natural resources in relation to activities under Article 3, paragraphs 3 and 4, in the next national communication.

20. During the review, Canada provided additional information on the national system, elaborating on institutional and legislative arrangements and administrative procedures for GHG inventory planning, preparation and management.

21. The ERT took note of the recommendations of the report of the individual review of the 2010 annual submission of Canada.⁴ The ERT concluded that the national system continued to perform its required functions as set out in decision 19/CMP.1.

3. National registry

22. In its NC5, Canada has provided information on the national registry, including a description of how its national registry performs the functions defined in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1 and how it complies with the requirements of the technical standard for data exchange between registry systems.

23. During the review, Canada provided additional information on the measures put in place to safeguard, maintain and recover registry data, the security measures employed in the registry to prevent unauthorized manipulations, the measures put in place to protect the registry against security compromises, the test procedures related to performance of the current version of the national registry and on the recording of the changes, operational plan and administrative guide. In response to the questions raised by the ERT, Canada provided documents demonstrating how it records the changes related to the national registry and how it maintains these records. The questions posed during the review were answered directly and succinctly by Canada. The ERT noted that updates of databases and applications, implemented security measures and changes to the national registry software are documented on a regular basis by nominated responsible staff.

⁴ FCCC/ARR/2010/CAN. Available at <<http://unfccc.int/resource/docs/2011/arr/can.pdf>>.

24. The ERT took note of the conclusion of the standard independent assessment report (SIAR) that Canada has acted on the recommendations of the previous ERT and that no further problems were identified in the SIAR.

25. The ERT concluded that Canada's national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with decisions 16/CP.10 and 12/CMP.1.

B. Policies and measures, including those in accordance with Article 2 of the Kyoto Protocol

26. As required by the UNFCCC reporting guidelines, Canada has provided in its NC5 information on its package of PaMs implemented and adopted in order to fulfil its commitments under the Convention and its Kyoto Protocol, even though the text of the NC5 did not refer explicitly to commitments under the Kyoto Protocol. Energy and transport sectors had their own textual descriptions of the principal PaMs, whereas agriculture, forestry and waste were presented in one section together. These policy descriptions were not supplemented by summary tables on PaMs. Such a table was provided in an annex to the NC5, but was not divided by sector or by gas, and was not referred to in the main text of the NC5.

27. The ERT noted that Canada did not provide the following reporting elements required by the UNFCCC reporting guidelines: information on how it believes its PaMs are modifying longer term trends in anthropogenic GHG emissions and removals, consistent with the objective of the Convention. During the review, Canada indicated that PaMs which improve the energy efficiency of buildings have a long-term impact on GHG emissions. Some of the recommendations from the previous review were taken into consideration to improve reporting in the NC5, including recommendations to organize the chapter on PaMs along the main sectors, and to provide quantitative estimates of the effects of federal PaMs. The ERT recommends that Canada also include information on longer term trends, provide the information on PaMs by sector and gas and include sectoral tables of PaMs in accordance with the UNFCCC reporting guidelines.

28. The ERT recommends that the Party improve transparency by reporting on the PaMs promoting transportation biofuels in the transport sector rather than in the energy sector and that Canada improve completeness by reporting on PaMs in agriculture, forestry and waste sectors both in textual and tabular formats.

29. Canada provided information on PaMs at national, provincial and territorial levels. The ERT noted that the set of PaMs reported in the NC5 was significantly different from that reported in the fourth national communication (NC4), which reflects the changes in policy framework between 2006 and 2009 from a regulatory framework to a cap and trade system. In the NC4, Canada reported on the Clean Air Act (tabled in Parliament in October 2006), which represented a significant shift from the previous voluntary approach to a regulatory one by setting new regulations on all major sectors. The Clean Air Act was expected to contribute significantly to long-term reductions of air pollutants and GHG emissions in several sectors. In the NC5, Canada reported on the Turning the Corner Regulatory Framework from 2007 for industrial GHG emissions. The proposed regulations were based on emission intensity targets covering major industrial sectors, and also included an offset system and credit for early action. In 2011, the policy framework shifted again to a regulatory approach due to economic circumstances and policy developments in the United States, Canada's largest trading partner.

30. During the review, Canada explained that as a consequence of the financial and economic crisis of 2008/2009, and also due to a new administration in the United States in the same period, the Government reassessed the regulatory framework, and decided to align its approach with that of the United States where possible. As noted in the NC5, in 2008, Canada announced its commitment to develop and implement a North America-wide cap and trade system. When it became apparent in 2009–2010 that the United States would not set up such a system, the direction of climate policy in Canada changed again. Currently, the Canadian climate policy is based on a sector-by-sector regulatory approach, aligned with the approach of the United States, given the highly integrated nature of the North American economy. The ERT noted that these changes in the policy framework have slowed down the mitigation action in Canada considerably as they did not create a stable framework for mitigation action by relevant stakeholders, in particular by business. Also, earlier planned PaMs (e.g. the regulatory regime for GHGs from major industrial emission sources) have not yet been fully replaced by others, thus equivalent emission reductions have not been achieved.

31. Currently, Canada's national PaMs rely largely on economic incentives for renewable energy and energy efficiency, and to some extent, on regulations for emissions from transportation and the energy efficiency requirements of products and appliances.

32. In the NC5, Canada did not report explicitly on its domestic and regional legislative arrangements and on its enforcement and administrative procedures established pursuant to the implementation of the Kyoto Protocol, in particular with regard to national strategies to meet its Kyoto Protocol target of –6 per cent compared with the base year level. During the review, the Party provided information on the KPIA. The purpose of the KPIA is to ensure that Canada meets its global climate change obligations under the Kyoto Protocol. It requires the Minister of the Environment to establish an annual Climate Change Plan for the Purposes of the Kyoto Protocol Implementation Act (Climate Change Plan) and states that the Governor in Council may make regulations regarding greenhouse gas emissions. The KPIA also requires the Commissioner of the Environment and Sustainable Development to submit to the Speaker of the House of Commons in Canada a report on progress in the implementation of the plans (see para. 40 below). The KPIA includes descriptions of the measures to be taken to ensure that Canada meet its obligations under Article 3, paragraph 1, of the Kyoto Protocol.

33. In the annex to its NC5, Canada provided a table of federal, and provincial and territorial PaMs, including estimates of the effects of federal PaMs for 2008–2012 that were based on the 2009 version of the Climate Change Plan. During the review, Canada presented estimates of the actual emission reductions for 2008 and the updated estimates for 2009–2012, based on the Climate Change Plan 2010. The ERT noted that only the effects of federal PaMs are quantified in the climate change plans under the KPIA, but according to the Party, provincial and territorial PaMs contribute equally to expected emission reductions (see para. 41). Considering the importance of provincial and territorial PaMs, the ERT encourages Canada to report on the mitigation effects of the most important provincial and territorial PaMs in addition to the federal PaMs in the next national communication, and to discuss the synergies and overlap between different federal, and provincial and territorial PaMs.

Table 3
Summary of information on policies and measures

<i>Major policies and measures</i>	<i>Examples/comments</i>
<i>Policy framework and cross-sectoral measures</i>	
Kyoto Protocol Implementation Act 2007	Legislative framework to ensure that Canada meets its commitments under the Kyoto Protocol
Clean Air and Climate Change Trust Fund	Fund through which the Federal Government supported major mitigation projects in provinces and territories
<i>Policies and measures by sector</i>	
<i>Energy</i>	
ecoENERGY for Renewable Power (2007–2011)	Incentives for the supply of electricity from renewable sources (4.7 Mt)
ecoENERGY Retrofit (2007–2011)	Incentives for the addition of energy efficiency improvements to homes and small- to medium-sized organizations (1.72 Mt)
ecoENERGY for Buildings and Houses (2007–2011)	Construction and operation of more energy efficient buildings and houses, encouraged through for example, the adoption of more stringent building energy codes, a home energy rating system and the provision of training (1.26 Mt)
Energy efficiency standards and labelling	Energy efficiency standards in place for 44 products, those for another 11 products are imminent; 55 voluntary Energy Star high performance specifications; and 8 products subject to mandatory EnerGuide comparative labelling
<i>Transport</i>	
ecoFREIGHT Programme (2007–2011)	Cost shared funding and support provided to the freight industry to reduce the emissions from the freight transportation sector by reducing barriers to freight technology market penetration (1.12 Mt)
Green levy	CAD 1,000–4,000 levy applies to passenger vehicles with an average fuel consumption ≥ 13 L per 100 km. Payable by the manufacturer/or the importer of a new vehicle, and the importer of a used vehicle (0.17 Mt)
Fuel economy standards	Adoption of GHG standards for cars and light trucks starting from the year of manufacture 2011 in line with United States' regulations
Renewable fuels regulations	Inclusion of 5 per cent renewable fuels in gasoline (since December 2010) and 2 per cent renewable fuels in diesel and heating oil (implemented in July 2011) (0.19 Mt)
<i>Agriculture</i>	
Beneficial management practices	Federal and provincial funding provided incentives to farmers to adopt beneficial management practices, which, among other benefits, decrease GHG emissions and enhance soil carbon sink
<i>Forestry</i>	
Sustainable management practices	Mitigation is a major consideration in initiatives related to the sustainable management of forests
Zero Net Deforestation (British Columbia)	British Columbia has set a target of zero net deforestation by 2015

<i>Major policies and measures</i>	<i>Examples/comments</i>
<i>Waste</i>	
Landfill gas recovery	Provincial regulations and incentives promote the collection of landfill gas and in some cases its use for energy

Note: The greenhouse gas reduction estimates, given for some measures (in parentheses), are reductions in CO₂ or CO₂ eq for the year 2010, based on the information in the NC5 and on updated information provided during the review.

34. The ERT noted that in the NC5, the single most effective instrument was estimated to be the Clean Air and Climate Change Trust Fund, through which the Federal Government supported major projects that were expected to result in GHG emission and air pollutant reductions in the provinces and territories. The effect of this instrument was estimated to be 16 Mt CO₂ eq reductions annually in 2008–2012. During the review, the ERT noted from the Climate Change Plan 2010, that the Party considered this estimate to be unreliable. Therefore, Canada no longer estimates the effect of the fund in the same way as it was done in NC5, but instead it estimates the effects of selected individual actions supported through the fund at provincial level. However, the ERT noted that the estimates of the effects of these actions are not available for all provinces.

35. In its NC5, Canada reported the budget allocated to several PaMs, for example, the ecoENERGY for Renewable Power Program is investing CAD 1.46 billion to provide incentives to increase Canada's supply of green electricity from renewable energy sources (RES). The ERT commends Canada for this transparent approach. The ERT encourages Canada to consider further improving the completeness of its reporting by reporting additional information on the costs of the different policies, in particular of those for which budget information is not reported.

36. In its NC5 and during the review, Canada has not reported on PaMs that could potentially increase emissions. However, in its NC5, the Party reported that the 2007 budget included the phasing out of the accelerated capital cost allowance for general investment in the oil sands by 2015. The ERT considers that this capital cost allowance could be an example of such a policy as emissions from extraction of oil from non-conventional sources have increased considerably in recent years and are expected to increase in the future. The ERT reiterates the encouragement of the previous review that Canada reports on actions taken to identify and periodically update its own policies and practices, which encourage activities that lead to greater levels of anthropogenic GHG emissions than would otherwise occur, and that it provides the rationale for such actions in the next national communication. Table 3 provides a summary of the reported information on the PaMs of Canada.

1. Policy framework and cross-sectoral measures

37. Environment Canada is in charge of national and international climate policies. Several other departments are also involved in the planning and implementation of the policies in their respective fields, for example, Transport Canada is responsible for development and implementation of environmental policies in the aviation, marine and rail sectors.

38. According to the information provided by the Party during the review, provinces and territories are often better placed to take certain action on climate change due to their jurisdiction over energy and natural resources. However, the Federal Government can also pass legislation on GHG emission limitations, as the environment is a matter of shared jurisdiction. The Canadian Council of the Ministers of the Environment (CCME), which is comprised of the environment ministers in federal, provincial and territorial governments,

meets at least once a year to discuss national environmental priorities and to determine work to be carried out under the auspices of the CCME.

39. Ministers set the strategic direction for the council, and the senior officials establish working groups of experts from the federal, provincial, and territorial environmental ministries to accomplish specific goals. Based on the decisions, each of the member governments develops and implements the policies, programmes and measures. Also, other federal, territorial and provincial ministers (for example, energy and forestry ministers) have such councils.

40. Concerning the monitoring and evaluation of PaMs, during the review, the Party explained that effects of climate policies are monitored and evaluated under the KPIA through the annual Climate Change Plan, by the analysis of the climate change plans by the National Round Table on the Environment and the Economy, and at least every two years by the report of the Commissioner of the Environment and Sustainable Development. PaMs are also monitored and evaluated under departmental reporting and evaluation requirements.

41. In the NC5, provincial climate plans and policies are introduced. During the review, the ERT learned that all provinces and territories in Canada have their own climate change plans, but the degree and field of action varies between provinces and territories. During the review, the Party provided examples of effective provincial climate policies, such as the revenue-neutral carbon tax on fossil fuels in British Columbia implemented in 2008; Alberta's Industrial Regulatory System for CO₂ implemented in 2007; Ontario's feed-in tariff for RES in order to increase the RES share and to phase out coal by 2014, implemented in 2009; Quebec's carbon levy on gasoline, diesel and fossil fuels distributed or produced in the province, implemented in 2007; and Nova Scotia's GHG cap for the electricity sector implemented in 2010. According to Environment Canada, modelling of currently announced and/or implemented PaMs of provincial action will account for roughly half of Canada's projected emission reductions up to 2020.

42. The ERT noted that there are a number of effective policies at the provincial and territorial level in place, but the effort or mechanisms to coordinate these policies and/or take stock of the lessons learned from their implementation seem to be lacking, which eventually will lead to fragmentation and reduced efficiency of Canada's climate change policy.

43. Due to the high importance of provincial action, the ERT encourages Canada to improve the transparency of its reporting by providing, in the next NC, more specific information on the competence of provincial/territorial and federal governments in matters related to climate change and on institutions and mechanisms put in place to share experience and practices from the implementation of policies at the provincial/territorial level. The ERT also encourages Canada to structure its reporting of provincial PaMs by sector rather than by province and to highlight which are the most important provincial/territorial PaMs in terms of emission reduction effects.

44. In the NC5, Canada mentioned its GHG reduction target of 20 per cent below 2006 levels by 2020. During the review, the ERT learned that Canada focuses currently on its target under the Copenhagen Accord, a 17 per cent reduction by 2020 compared with the 2005 level. The ERT noted that this target is less stringent than the earlier target and implies an increase of emissions compared with the Kyoto Protocol target. The ERT also noted that Canada did not demonstrate how the combined effect of current or planned measures would lead to reaching the target (see also para. 84).

2. Policies and measures in the energy sector

45. Between 1990 and 2009, GHG emissions from the energy sector increased by 21.1 per cent (98.50 Tg CO₂ eq), mainly driven by fossil fuel industries due to increased production of unconventional crude oil and natural gas, increased transportation activities, and strong economic activity growth in the commercial and institutional sector. Emissions from fossil fuel industries increased by 51 per cent from 1990 to 2009, due to increased production levels. This includes increased production of oil from oil sands, which requires much more energy than conventional oil production. Even though the GHG intensity of oil production from oil sands has decreased considerably, the energy required is still 1.6 times that of conventional oil production.

46. Emissions from road transport increased by 36.0 per cent between 1990 and 2009. Emissions from light-duty gasoline trucks more than doubled in the same period, whereas emissions from gasoline-fuelled cars decreased. This reflects the trend towards the increasing use of SUVs, minivans and pick-up trucks for personal transportation. The increasing horsepower for all classes of passenger vehicle has in part offset the energy efficiency improvements in internal combustion engines in cars. The emissions from heavy-duty trucks also increased due to the deregulation of the haulage industry and the increased quantity shipped by road as a result of customer requirements for just-in-time delivery and increased cross-border freight. Between 1990 and 2009, emissions from electricity and heat generation increased by 6.9 per cent, emissions from manufacturing industries, construction and mining increased by 16.1 per cent and emissions from commercial and institutional subsector increased by 40.2 per cent. The emissions from the residential sector fluctuated during the same period following the fluctuating heating demand due to heating degree days.

47. *Energy supply.* In the public electricity and heat production sector, electricity generation has increased by 27.0 per cent from 1990 to 2009. The GHG emissions have increased to a lesser extent in the same period, 6.9 per cent, due to the increased utilization of hydro and nuclear sources to produce energy, and a shift from refined petroleum products (such as heavy fuel oil or diesel) to natural gas for heat and electricity production. The use of coal is responsible for 77.0 per cent of GHG emissions from electricity generation in Canada and was roughly at the same level in 2009 as in 1990. The share of biomass and other renewables (wave and wind) in electricity generation has increased rapidly, but they still accounted for only 0.4 per cent and 1.2 per cent respectively of electricity generation in 2009.

48. During the review, the Party explained that in June 2010, the Government announced a proposed regulation for coal-fired electricity generation. The Party explained after the review week that draft regulations were released in August 2011. As a large share of current coal-fired plants are coming to the end of their life cycles, the proposed regulation will allow moving to low- or non-emitting electricity production through tight CO₂ regulations for new coal-burning power plants. The proposed regulation will include performance standards set at the emission intensity of natural gas combined cycle and incentives for carbon capture and storage, and is expected to come into effect in July 2015. It is expected to reduce emissions from coal-fired electricity generation by about 45 per cent between 2005 and 2020, whereas emissions from the electricity sector as a whole are projected to decrease by about 29 per cent during the same period.

49. *Renewable energy sources.* Canada has set a national target to produce 90 per cent of electricity from GHG-free sources by 2020, compared with the share of 63 per cent in 2009. According to the NC5, the most important federal renewable energy PaM is the ecoENERGY for Renewable Power Program, which provides an incentive of CAD 0.01 kWh⁻¹ for up to 10 years to qualifying projects to produce electricity from wind, biomass, low impact hydropower, geothermal, solar photovoltaic or ocean energy. During

the review, the Party explained that in 2008, the emission reduction effect of the programme was 1.35 Mt CO₂ eq, which is less than the expected effect reported in the NC5 of 2.2 Mt CO₂ eq. During the review, the Party informed the ERT about the expected emission reduction in 2012 of 6.0 Mt CO₂ eq.

50. The ecoENERGY for the Renewable Heat Program invests CAD 36 million over four years in incentives and industry development to support the adoption of renewable thermal technologies such as solar heating. The emission reduction effect in 2008 was projected at 0.005 Mt CO₂ eq, and during the review, the Party explained that the actual effect was 0.003 Mt CO₂ eq in 2008. The estimated emission reduction effect is 0.025 Mt CO₂ eq in 2012. Canada also supports the research, development and demonstration of clean energy technologies through the ecoENERGY Technology Initiative, and provides an accelerated capital cost allowance for equipment used to generate clean, renewable energy, fuels from waste and fossil fuels in an efficient manner.

51. At the provincial level, several PaMs are in place to promote RES, such as the feed-in tariff in Ontario, the carbon tax in British Columbia and the GHG cap for the electricity sector in Nova Scotia (see para. 41). In addition, Saskatchewan provides low interest loans to install geothermal, solar and small scale wind power electricity generating devices.

52. **Energy efficiency.** A regulatory agenda under the Energy Efficiency Act, introduces new and tightened energy efficiency standards and the labelling of electrical appliances, which account for 80 per cent of energy use in homes and businesses in Canada. According to the Climate Change Plan 2010, the GHG reduction effect in 2008 was 0.09 Mt CO₂ eq, as estimated at the time of preparation of NC5. The updated expected reduction effect in 2012 has been reassessed from 3.55 Mt CO₂ eq to 2.99 Mt CO₂ eq in the Climate Change Plan 2010. In addition, Canada promotes energy efficiency through financial investments in buildings, transportation and industry (see below). During the review, Canada also presented education and public awareness measures that were put in place to promote energy saving.

53. **Residential and commercial sectors.** Floor space of residential buildings has increased by 45 per cent from 1990 to 2008. At the same time, the switch by domestic and commercial users from heavy fuel oil to natural gas and improved energy efficiency has offset the emission increase due to floor space expansion. Annual variation in the heating demand (heating degree days) causes fluctuations in the emissions trend. According to the national inventory report (NIR) 2011, energy efficiency measures in new residential buildings have been encouraged through programmes such as the R-2000 Initiative and residential home improvement incentive programmes such as the EnerGuide for Homes (replaced by the ecoENERGY Retrofit Initiative in 2007, see para. 55 below). These programmes have been estimated to have led to significant reductions in GHG emissions. In total, emissions from the residential sector have decreased from 1990 to 2009 when adjusted for temperature variations. Emissions from the commercial and institutional subsector increased by 40 per cent between 1990 and 2009 due to strong economic activity growth increasing demand for energy services.

54. The ecoENERGY for Buildings and Houses Program invests CAD 60 million over four years to encourage the construction and operation of more energy efficient buildings and houses. According to the additional information provided during the review, the programme contributed to emission reductions of 0.58 Mt CO₂ eq in 2008, more than estimated in the NC5 (0.32 Mt CO₂ eq). During the review, the Party informed the ERT about the expected emission reduction in 2012 of 1.81 Mt CO₂ eq.

55. The ecoENERGY Retrofit Initiative provides incentives for energy efficiency improvements in homes and in small and medium-sized organizations in the institutional, commercial and industrial sectors. The total budget was CAD 805 million over 5 years, and

it yielded emission reductions of 0.39 Mt CO₂ eq in 2008, less than estimated in NC5 (0.46 Mt CO₂ eq). During the review, the Party informed the ERT about the expected emission reduction in 2012 of 1.94 Mt CO₂ eq.

56. **Transport sector.** A regulation to establish a minimum average renewable fuel content level of 5 per cent in the gasoline pool came into effect on 15 December 2010, and a 2 per cent average renewable fuel content in the diesel pool came into effect 1 July 2011. During the review, the Party explained that the use of biofuels in transportation is also promoted by supporting the expansion of the Canadian production of renewable fuels (ecoENERGY for Biofuels Program) and by accelerating the commercialization of new technologies (Sustainable Development Technology Canada Next-Gen Biofuels Fund). During the review, the Party explained that this PaM is expected to reduce GHG emissions by 2.01 Mt CO₂ eq in 2012. A green levy is imposed on passenger vehicles with an average fuel consumption rating greater than or equal to 13 L per 100 km. The estimated emission reduction effect is, according to the NC5, 0.23 Mt CO₂ eq in 2012. There are also other PaMs, including information measures (ecoENERGY for Personal Vehicles); and investment programmes targeted at reducing emissions from urban transportation (ecoMOBILITY) and measures to promote the scrappage of old vehicles and the purchase of energy efficient passenger cars. In 2011, Canada implemented new GHG emission standards for passenger cars and light-duty trucks, that align with the United States' Department of Transportation fuel-economy standards for 2011 model years and align with the United States' Environmental Protection Agency GHG performance standards for 2012 and later model years. New, more stringent standards are planned for post-2016 model years. Canada is also developing common North American standards for heavy-duty vehicle GHG emissions. Another investment programme is the EcoFREIGHT Program which aims to reduce the GHG emissions from freight transport through improved technology. The estimated GHG reduction effect in 2012 is 1.4 Mt CO₂ eq according to NC5.

57. Canada reports on how it promotes the decisions of the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO) to reduce GHG emissions. To reduce emissions from aviation, in 2005, Canada negotiated with its domestic air carriers a memorandum of understanding, in which the air carriers committed to achieve a 24 per cent cumulative improvement in fuel efficiency between 1990 and 2012. During the review, the Party explained that this target had already been achieved: fuel efficiency in the domestic aviation industry improved by 29 per cent in 2008 compared with 1990 levels.

58. **Industrial sector.** Emissions from manufacturing industries and construction, including mining, increased by 16.1 per cent between 1990 and 2009. In particular, emissions from mining increased by 371 per cent due to a large increase in unconventional oil extraction, for example oil sands mining.

59. According to the review report of the NC4, Canada had planned a comprehensive regulatory regime for GHGs from major industrial emission sources. The preliminary estimate of the expected emission reduction effect was 46.6 Mt CO₂ eq in 2010. During the review, Canada explained that the plan was not implemented due to the change in policy direction (see paras. 29 and 30).

60. Energy efficiency in the industry sector is promoted by the ecoENERGY for Industry Program, which invests CAD 18 million over four years to accelerate energy saving investments and the exchange of best practice information. During the review, the Party explained that the emission reduction effect was 0.64 Mt CO₂ in 2008, notably more than estimated in NC5 (0.17 Mt), and that the expected emission reduction effect is 1.54 Mt CO₂ eq in 2012. The Pulp and Paper Green Transformation Program was announced in June 2009, and was therefore not included in the NC5. The programme has a CAD 1 billion

budget for approved capital projects at Canadian pulp and paper mills for areas such as renewable energy and energy efficiency. The Party explained during the review that although the programme was not designed to reduce GHG emissions specifically, it is expected to reduce emissions by 1.09 Mt CO₂ in 2012.

61. The ERT noted that the estimated GHG reduction effect of current policies are considerably smaller than those estimated previously for the industrial regulations that were considered in the calculations but eventually did not enter into force. During the review, the Party explained that the Government is considering new measures to address emissions from key industrial sectors, including the oil and gas sector. In this sector, GHG emissions are forecast to increase due to the increased use of oil sands and the Government plans to consider performance standards to address these emissions.

62. The ERT noted during the review that all ecoENERGY programmes were on hold since March 2011. After the review week, the Party explained that the programmes were renewed in the most recent federal budget.

3. Policies and measures in other sectors

63. Between 1990 and 2009, GHG emissions from industrial processes (including solvent and other product use), agriculture and waste increased by a total of 0.9 per cent (1.14 Tg), driven mainly by a decrease in the industrial processes sector (18.4 per cent or 10.44 Tg), compensated by an increase in the agriculture sector (19.2 per cent or 8.99 Tg).

64. *Industrial processes.* Between 1990 and 2009, GHG emissions from the industrial processes sector decreased by 18.4 per cent (10.44 Tg), driven mainly by the decrease in metal production. CO₂ emissions from iron and steel production decreased, despite increases in steel production, due to an increased use of recycled steel. Aluminium production almost doubled but emissions declined by 22.3 per cent due to emission controls applied to electrolytic production processes and to the prevention of anode effects. Emissions from chemical industries decreased due to the introduction of N₂O abatement technologies in an adipic acid plant, and due to its closure in 2009. During the review, the Party explained that these emission reductions were due to economic drivers rather than PaMs. These emission reductions were offset partly by the increasing emissions from production and consumption of halocarbons. The ERT noted that Canada does not have PaMs in place in the industrial processes sector, but the Party has indicated that they are moving forward to develop regulatory measures for major-emitting industrial sectors.

65. *Agriculture.* Between 1990 and 2009, GHG emissions from the agriculture sector increased by 19.2 per cent (9.0 Tg), driven mainly by growing numbers of beef cattle, swine and poultry, and increases in the application of nitrogen fertilizers in prairies. During the review, the Party explained that increased use of nitrogen fertilization was due to the reduction in the practice of summer fallow in the prairie region. As summer fallow area declined, the area of crops produced under reduced tillage systems increased reduced tillage and summer fallow. Less summer fallow and more crop production using reduced tillage, These practices at the same time increased nitrogen fertilizer use and, have enhanced the soil carbon sink of agricultural land. The Party explained during the review that net emissions from agriculture in Canada, including both emissions in the agriculture sector (see para. 66) and soil carbon of agricultural land reported in the LULUCF sector (see para. 67), decreased by 16 per cent from 1990 to 2009.

66. In its NC4, Canada reported on its GHG reductions and the enhancement of removals in the agriculture sector as part of the Government's Action Plan 2000, which was a package of measures to reduce GHG emissions in all sectors. In the NC5, Canada reported on PaMs to promote production of transportation biofuels and other bioproducts, but it did not report on any policies that had been put in place to address emissions caused

by animal husbandry or cultivation. During the review, Canada explained that the overall PaMs have not changed since NC4. The Party also explained that through development and adoption of new management practices, the GHG intensity of agriculture was reduced considerably. About 77,000 farmers in Canada have prepared environmental farm plans, and provinces provide incentives for farmers to adopt beneficial management practices.

67. **LULUCF.** The LULUCF sector was a net sink of 12.10 Tg CO₂ eq in Canada in 2009 and net GHG removals decreased by 82.1 per cent since 1990. Natural disturbances cause significant variability in the trend of emissions and removals from the LULUCF sector, which is a net sink for 11 of the 20 years in the time series, and a source in the remaining years. The underlying trend in forest land was driven mainly by increased harvesting in forest-land up to 2004/2005. Since then, harvests have decreased due to restructuring of the Canadian forestry sector. Croplands have turned from a 11.3 Tg CO₂ eq source in 1990 to a sink of 6.9 Tg in 2009 due to a change in agricultural land management practices in western Canada (see para. 66 above). GHG emissions from conversion of forest-land into other land uses have decreased by 30.8 per cent from 1990 to 2009 due to a decline in deforestation for agricultural land. This trend is offset partly by the increased conversion of forest-land into land for oil and gas extraction, for which emissions have doubled from 1990 to 2009. Natural disturbances caused significant variability in the trend of emissions and removals from the LULUCF sector.

68. In its NC5, Canada noted that the Canadian Council for Forest Ministers developed a framework for forest management offset protocols. However, the ERT learned during the review that this initiative did not progress due to the change in policy direction that occurred. Canada explained that mitigation is a major consideration in initiatives related to the sustainable management of forest resources. The Party further explained that forest conversion is best addressed by regional PaMs. For example, British Columbia has a goal of achieving zero net deforestation by 2015. Some provinces, for instance Alberta, are developing offset protocols, and there are also plans to include forestry in the planned carbon trading schemes.

69. **Waste management.** Between 1990 and 2009, GHG emissions from the waste sector increased by 13.1 per cent (2.5 Tg), driven mainly by increasing emissions from landfills. However, the emissions have increased at a lower rate than the population. In its NC5, Canada has not reported on federal PaMs to mitigate emissions from the waste sector, but some provinces were reported to have instigated PaMs to regulate landfill gas (British Columbia, Ontario); and to produce biomethane by processing residual biomass and reducing biogas from landfills (Quebec). During the review, the Party explained that currently, 6.9 Mt of landfill gas is recovered in Canada, based on a mix of provincial regulations and incentives. Existing provincial measures are expected to result in the recovery of an additional 2 Mt landfill gas by 2020.

70. In order to increase the transparency of the reporting of PaMs in its next national communication, the ERT encourages Canada to indicate clearly its national and international GHG reduction targets; to note which PaMs presented in previous NCs are no longer in place, and to provide a clear reference to previous NCs in cases where PaMs have been maintained over time and are thoroughly described in a previous NC; to report quantitative emission reduction estimates for all PaMs including the agriculture, forestry and waste sectors; to follow the UNFCCC reporting guidelines more closely and to give priority in reporting PaMs, or combinations of PaMs, which have the most significant effect on GHG emissions and removals; to indicate those PaMs which are innovative and/or effectively replicable by other Parties; as well as to include information on PaMs that address domestic aviation and navigation in the transport sector instead of in the chapter on supporting action by the ICAO/IMO.

71. The ERT further encourages Canada to improve transparency by using the same name for the same policy across the national communication and to refer in the main text to tables in the annexes. The ERT noted that Canada presented, in its NIR, illustrative information on different factors having an impact on, for example, trends in energy consumption of buildings, including changes in floor space, fuel switch and energy efficiency. The ERT encourages Canada to include such information in its next national communication.

4. Minimization of adverse effects in accordance with Article 2, paragraph 3, of the Kyoto Protocol

72. In its NC5, Canada reported information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and social and environmental impacts, on other Parties, especially developing country Parties. Further information on how Canada strives to implement its commitments under Article 3, paragraph 1, in such a way as to minimize adverse social, environmental and economic impacts on the developing country Parties, as reported in the 2011 annual submission is presented in chapter II.I of this report.

73. The NC5 emphasizes strategic environmental assessments (SEAs), which are used to encourage Government departments and agencies to incorporate environmental considerations into the review process of policies, plans and programmes that, if approved, would lead to the development of public policy. SEAs include considerations of both economic and social analyses and consider the likely impact of any adverse environmental effects.

C. Projections and the total effect of policies and measures, and supplementarity relating to the Kyoto Protocol mechanisms

74. The NC5 contains projections and an estimate of the total effect of policies and measures based on Canada's Climate Change Plan 2009. The NC5 refers to the (then unpublished) 2010 version of the Climate Change Plan for further updated information. During the review, Canada provided updated projections based on Climate Change Plan 2010, which are considered in this review report along with projections reported in the NC5.

1. Projections overview, methodology and key assumptions

75. The GHG emission projections provided by Canada in the NC5 include a 'with measures' and a 'without measures' scenario until 2012. Projections are provided in an aggregate format for national total emissions, using global warming potential values. However, the ERT noted that Canada did not provide the following reporting elements required by the UNFCCC reporting guidelines: emission projections presented relative to actual inventory data for the preceding years; projections presented on a sectoral basis (to the greatest extent possible, using the same sectoral categories used in the PaMs section); projections presented on a gas-by-gas basis for the following GHGs: CO₂, CH₄, N₂O, perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (treating PFCs and HFCs collectively in each case); and emission projections related to fuel sold to ships and aircraft engaged in international transport. During the review, Canada provided further relevant information. The ERT reiterates the recommendation of the previous review, that Canada, to increase completeness, should follow the UNFCCC reporting guidelines more closely and should provide all these reporting elements in its next national communication.

76. The updated projections provided during the review included all mandatory elements, but did not include projections for LULUCF. The main two differences between the updated projections and those provided in the NC5 are that they now take into account the effects of the financial and economic crisis and no longer consider the effect of the regulatory regime for major industrial emission sources (see para. 59).

77. Canada provided a 'no government action' scenario for updated projections, which would be a 'without measures' scenario and a 'current action' scenario, which would be a 'with measures' scenario. The 'with measures' scenario assumes the full implementation of plans, measures and sectoral legislation that were adopted by 2010. The ERT noted that both scenarios start from the 2008 inventory data, which means that the 'without measures' scenario includes all implemented and adopted PaMs until 2008.

78. Emission projections were prepared using Environment Canada's integrated E3MC (Energy, Emissions and Economy Model for Canada). This model is being used for developing and assessing the proposed policies, programmes and targets for GHG emissions. It is a fully integrated energy, emissions and economy model. It explicitly models energy, emissions and production outputs for industrial, residential, commercial, transportation and other sectors. It ensures that the macroeconomic impacts of the proposed targets for GHG and air pollutant emissions are assessed in a consistent manner. NC4 projections were prepared using Maple-C, a similar model but operated by Natural Resources Canada.

79. Key assumptions for the updated projections include an annual GDP growth of 2–3 per cent after the financial and economic crisis; an annual population growth of 1 per cent; an after the financial crisis steadily increasing crude oil price peaking at USD 96/bbl in 2020; and a stabilization of the gas price at the pre-crisis level until 2020. Other main assumptions include a shift in oil production from conventional to unconventional methods (oil sands), mainly to meet the growing demand in the United States, and an increase of electricity production capacity by a third until 2020. In its NC5, Canada did not provide the relevant information on the factors and activities for each sector for the years 1990 to 2020. Although Canada did provide relevant information on some factors and activities during the review, data on energy supply and demand by sector was not provided.

80. The NC5 did not provide a sensitivity analysis, but a reference to the Climate Change Plan 2009 for sensitivity analysis was included. To test the sensitivity of the updated projections to underlying assumptions, Canada calculated two additional scenarios for updated projections: a high GDP/high oil price that assumes a national GDP that is 3 per cent higher than the standard case and an oil price of USD 186/bbl (compared with USD 96 in the reference case) leading to emissions of 839 Mt CO₂ eq in 2020, which is 7 per cent higher than in the standard case (785 Mt CO₂ eq); and a low GDP/low oil price that assumes a national GDP that is 2 per cent lower than the standard case and an oil price of USD 52/bbl leading to emissions of 747 Mt CO₂ eq (–5 per cent) in 2020.

2. Results of projections

81. The national communication includes projections until 2012 as a 'with measures' scenario and a 'without measures' scenario. In the NC5 projections, the overall GHG emissions of Canada were expected to decrease from 731 Mt CO₂ eq in 2005 to 691 Mt CO₂ eq in 2010 (–40 Mt CO₂ eq, or 6 per cent compared with 2005).

82. In the updated projections, the overall GHG emissions of Canada are expected to decrease from 731 Mt CO₂ eq in 2005 to 710 Mt CO₂ eq in 2010 (mostly due to the economic crisis) and then increase again to 785 Mt CO₂ eq in 2020 (+54 Mt CO₂ eq compared with 2005, or an annual average increase of 1 per cent after 2010) in the 'with measures' scenario. For the period 2005–2020, this scenario shows a decrease in emissions

from coal used for electricity production, due to phase out measures (–43 Mt CO₂ eq) and a decrease in emissions from conventional oil production (–9 Mt CO₂ eq). It does, however, show a strong increase in emissions from oil sand exploration (+62 Mt CO₂ eq), ground based freight transport (+18 Mt CO₂ eq), electricity production from natural gas (+15 Mt CO₂ eq), light manufacturing (+7 Mt CO₂ eq) and from solid waste disposal (+4 Mt CO₂ eq). Total emissions per gas are expected to increase until 2020 for all gases, except for CH₄. Fugitive CH₄ emissions from conventional oil production are expected to decline due to decreasing production as a result of depletion of reserves. A summary of the projections in the NC5 and updated projections provided during the review is given in table 4.

Table 4
Summary of greenhouse gas emission projections for Canada

	Greenhouse gas emissions (Tg CO ₂ eq per year)	Changes in relation to base year level (%)	Changes in relation to 1990 level (%)
Inventory data 1990 ^a	590.42	–0.6	0.0
Inventory data 2003 ^a	731.73	23.2	23.9
Inventory data 2009 ^a	690.05	16.2	16.9
Kyoto Protocol base year ^b	594.00	0.0	0.6
Kyoto Protocol target ^b	558.36	–6.0	–5.4
‘Without measures’ projections for 2010 ^c	743.00	25.1	25.8
‘With measures’ projections for 2010 ^c	691.00	16.3	17.0
Updated ‘without measures’ projections for 2010 ^d	720.00	21.2	21.9
Updated ‘with measures’ projections for 2010 ^d	710.00	19.5	20.3
Updated ‘without measures’ projections for 2020 ^d	850.00	43.1	44.0
Updated ‘with measures’ projections for 2020 ^d	785.00	32.2	33.0

Sources: ^a Canada’s 2011 greenhouse gas (GHG) inventory submission; the emissions are without land use, land-use change and forestry (LULUCF);

^b Based on the initial review report contained in document FCCC/IRR/2007/CAN;

^c Canada’s fifth national communication; the projections are for GHG emissions without LULUCF;

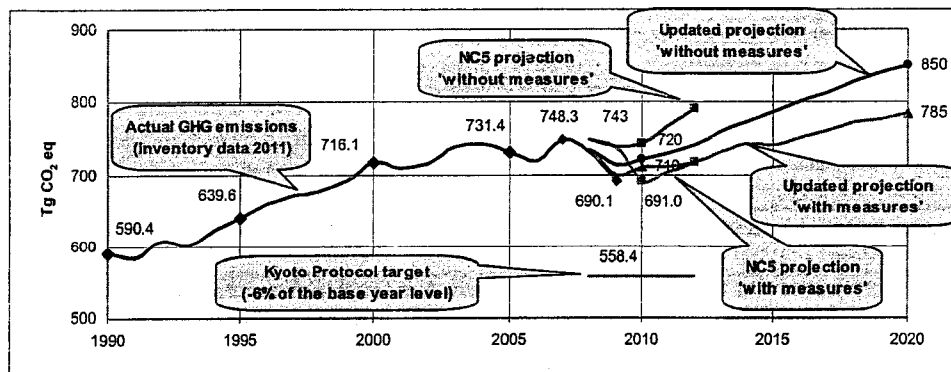
^d Updated projections provided by the Party during the in-depth review; the projections are for GHG emissions without LULUCF.

83. The ERT noted that, in its NC5, Canada did not present its projections relative to its target for the first commitment period of the Kyoto Protocol (2008–2012). During the review, Canada informed the ERT that its total GHG emissions are expected to be well above that target. Emissions in 2010 according to the updated projections are projected to be 19.5 per cent above the base year emissions, whereas the target is 6 per cent below the base year. The gap to the Kyoto Protocol target according to the updated projections is even larger than that according to the NC5 projections. The ERT estimated that, according to the

2011 inventory report, LULUCF activities under Article 3, paragraph 3, and those elected under Article 3, paragraph 4, may contribute to meeting the target by 1 to 2 Mt CO₂ eq per year, which is less than 0.5 per cent of the base year emissions. Canada also informed the ERT that currently it is not contemplating use of the Kyoto mechanisms to meet its Kyoto Protocol target. Also, despite the request by the ERT, Canada did not present a comprehensive plan to close the gap to its Kyoto Protocol target. The ERT noted with strong concern that on the basis of the information provided in its NC5 and during the review, Canada could potentially become non-compliant with its commitments under Article 3, paragraph 1, of the Kyoto Protocol.

84. The ERT noted that Canada's emission reduction targets decreased in ambition over time. The Kyoto Protocol target amounts to 558 Mt CO₂ eq per year in 2008–2012. The NC5 states that Canada is committed to reducing GHG emissions by 20 per cent below 2006 levels by 2020, which corresponds to 575 Mt CO₂ eq (16 Mt CO₂ eq higher and 10 years later), if applied to emissions excluding LULUCF. During the review, Canada explained that this target is now replaced by its new Copenhagen Accord target, which is aligned with that of the United States, of reducing emissions by 17 per cent below 2005 in 2020, which would correspond to 607 Mt CO₂ eq (yet 32 Mt CO₂ eq higher), if applied to emissions excluding LULUCF. The latest projections indicate that this target will not be met with currently implemented PaMs. Canada has not yet provided a detailed plan on how to meet its Kyoto Protocol or its Copenhagen Accord target. The ERT took note of the recommendations in the review report of NC4 and reiterated the encouragement that Canada should further report on planned PaMs to reach its targets. The reporting guidelines include the option to provide a 'with additional measures' scenario for this purpose.

Greenhouse gas emission projections



Sources: (1) Data for the years 1990–2009: Canada's 2011 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry. (2) Data for the years 2008–2020: Canada's NC5 and updated projections provided by the Party during the in-depth review; the emissions are without land use, land-use change and forestry.

3. Total effect of policies and measures

85. In the NC5, Canada presents an estimate of the total effect of its PaMs, in accordance with the 'with measures' definition, compared with a situation without such PaMs. The ERT noted an inconsistency in the NC5 between the projections chapter, where the regulatory regime for major industrial emission sources was still included as major reduction measure, and the PaMs chapter, where this PaM was not mentioned as it eventually never entered into force. To increase transparency, the ERT recommends that

Canada ensures, in its next national communication, that the reported 'with measures' scenario encompasses currently implemented and adopted PaMs.

86. The ERT noted that Canada did not provide in its national communication the estimate of the total effect of its PaMs by gas. In response to a question raised by the ERT during the review, Canada presented for updated projections information in terms of GHG emissions avoided or sequestered, also by gas (on a CO₂ eq basis) following the reporting requirements of the UNFCCC reporting guidelines. The ERT noted that this updated information is consistent with the updated information on the policies.

87. Canada reported that the total estimated effect of adopted and implemented PaMs is 10 Mt CO₂ eq in 2010 and 65 Mt CO₂ eq in 2020. The total effect was calculated as the difference between the 'with measures' and the 'without measures' scenarios. The ERT noted that the 'without measures' scenario includes the effects of PaMs until 2008 (see para. 77), therefore, only effects after 2008 are shown and as a result the reported total effect might have been underestimated.

88. According to the information provided during the review, PaMs implemented in the electricity sector (due to the phase out of coal) will deliver the largest emission reductions, followed by the effect of PaMs implemented in the transportation sector. The most effective PaMs and drivers behind GHG emission reductions are described in chapter II.B.1 and II.B.2. Table 5 provides an overview of the total effect of PaMs as reported by Canada.

Table 5
Projected effects of implemented and adopted policies and measures in 2010 and 2020

Sector	Effect of implemented and adopted measures (Tg CO ₂ eq)	Relative value (% of 1990 emissions)	Effect of implemented and adopted measures (Tg CO ₂ eq)	Relative value (% of 1990 emissions)
	2010		2020	
Buildings	1.00	0.2	2.00	0.3
Transportation	2.00	0.3	14.00	2.4
Electricity and heat production	7.00	1.2	48.00	8.0
Oil and gas	0.00	0.0	1.00	0.2
Emissions- intensive trade exposed industries	0.00	0.0	1.00	0.2
Agriculture	0.00	0.0	0.00	0.0
Waste and other	0.00	0.0	0.00	0.0
Total	10.00	1.7	66.00	11.1

Source: Information on updated projections provided by Canada during the review.

Note: The total effect of implemented and adopted policies and measures is defined as the difference between the 'without measures' and 'with measures' scenarios.

89. To increase transparency, the ERT encourages Canada to report its projections and the total effects of its policies and measures in the format requested by the UNFCCC reporting guidelines. It also encourages Canada to consider an earlier starting year for the 'without measures' scenario used for the evaluation of the effects of the measures, for

example 2000 or 2005, as Canada has started doing for its national reporting on its commitments under the Kyoto Protocol as of 2011.

4. Supplimentarity relating to mechanisms pursuant to Articles 6, 12 and 17

90. Canada in its NC5 did not provide information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. In response to a question raised by the ERT during the review, Canada clarified that Canada is not currently contemplating significant use of the Kyoto mechanisms to meet its Kyoto Protocol target.

91. Also, in response to a question raised by the ERT during the review, Canada clarified that it had invested CAD 22.5 million from climate change funding under the previous Government (as provided for in Budget 2000 and Action Plan 2000) in the World Bank Carbon Funds. This investment was distributed as follows: the Prototype Carbon Fund (CAD 15 million), the Community Development Carbon Fund (CAD 3.4 million) and the BioCarbon Fund (CAD 4 million). As a result of this investment, Canada has received a share of carbon credits generated by these funds. To date, 265,077 certified emissions reductions (CERs) have been transferred from the clean development mechanism Registry to the Government of Canada's holding account in Canada's Kyoto Protocol Registry. The total amount of expected CERs by the end of 2012 is approximately 1 million. This represents an estimated value of less than 0.05 per cent of the Kyoto Protocol base year annually, if evenly distributed over the 5-year commitment period.

D. Vulnerability assessment, climate change impacts and adaptation measures

92. In its NC5, Canada has provided all the required information in accordance with the UNFCCC reporting guidelines, including information on the expected impacts of climate change and vulnerability on the country, as well as on adaptation options. Adverse impacts have been described with regard to their possible socio-economic consequences. Canada provided information on the actions taken to implement Article 4, paragraph 1(b) and (e), of the Convention to cooperate in preparing for adaptation to the impacts of climate change as required by the reporting guidelines. The NC5 presents observable and likely climate change impacts on agriculture; biodiversity and ecosystems; water resources; fisheries, oceans, and coastal zones; forestry; human health; infrastructure and economy; transportation; and tourism. Table 6 summarizes the information on vulnerability and adaptation to climate change presented in the NC5.

93. The ERT noted that significant progress has been made in Canadian scientific research and the understanding of the continuing impacts of climate change since Canada's NC4. The Government of Canada led a national scientific assessment of the country's vulnerabilities to climate change and current and possible future adaptation measures. Through a regional approach, the assessment examined the current and future risks and opportunities presented by climate change, with a focus on human and managed systems. The resulting report, *From Impacts to Adaptation: Canada in a Changing Climate 2007*, reflects the advances made in understanding Canada's vulnerability to climate change over the past decade and integrated both traditional knowledge and scientific information in its analysis. The primary focus has been to improve understanding and to integrate indigenous knowledge. Canada reports that climate change will exacerbate many current climate risks, and present new risks, with significant implications for communities, infrastructure and ecosystems. Climate change scenarios for the country project an increased risk of extreme weather and other climate-related events such as floods, drought, forest fires and heat-

waves. Air quality in many Canadian communities is likely to be affected by climate change through increased smog formation, wild-fires, pollen production, and greater emissions of air contaminants due to changing human behaviour.

Table 6
Summary of information on vulnerability and adaptation to climate change

<i>Vulnerable area</i>	<i>Examples/comments/adaptation measures reported</i>
Food supply (agriculture and fisheries)	<i>Vulnerability:</i> Increased insect infestations; decreased food production; heat stress in livestock; <i>Adaptation:</i> Crop insurance programmes; promotion of best management practices to reduce vulnerability to extreme climate events and to crop disease.
Biodiversity and natural ecosystems	<i>Vulnerability:</i> Droughts; floods; wild life disturbances; impact on reproduction and dormancy patterns of species; <i>Adaptation:</i> The establishment of networks of protected areas to ensure the continued provision of ecosystem services for adaptation, as well as biodiversity conservation.
Forests	<i>Vulnerability:</i> Species are expected to migrate northwards and to higher altitudes; more frequent droughts are anticipated; more frequent and intense natural disturbances such as forest fires and insect outbreaks are envisaged; <i>Adaptation:</i> Forest fire management strategies; action plan for Mountain Pine Beetle.
Human health	<i>Vulnerability:</i> Adverse impacts on vulnerable populations, for example, the elderly, children, the sick and the poor; and rural residents; <i>Adaptation:</i> Establishing effective health programmes; Heat and Infectious Disease Alert and Response system; clean air initiatives.
Infrastructure and economy	<i>Vulnerability:</i> Indigenous and other Arctic communities being vulnerable to the impacts of global warming: the melting and thawing of snow affects their infrastructure, their mobility and the wild life resources available to them; and increases the occurrence of heat stress; <i>Adaptation:</i> The introduction of emergency and disaster management planning; fiscal measures to advance the implementation of adaptation projects; infrastructure codes and standards; and building knowledge regarding these problems and therefore a capacity to deal with them.
Water resources	<i>Vulnerability:</i> Increased winter flows are expected in many regions, as are decreased summer flows, leading to a reduction in water quality, and floods; <i>Adaptation:</i> Implementation of efficient water resources management.
Transportation	<i>Vulnerability:</i> Most vulnerable are northern ice roads, Great Lakes shipping, coastal infrastructure and infrastructure situated on permafrost; <i>Adaptation:</i> Modification, reinforcement or relocation of existing public infrastructure.
Tourism and recreation	<i>Vulnerability:</i> Reduced quality of natural resources will impact on the length and quality of outdoor recreation seasons; reduce the accessibility to the public of known iconic natural attractions; and reduced natural snowfalls will lead to shorter winter seasons; <i>Adaptation:</i> Use of snow-making technology.

94. The impacts are particularly apparent in Canada's Arctic north, where pronounced temperature increases are already having significant impacts on northern ecosystems and biodiversity, and on the northern communities that rely on these resources. These effects include decreased access to traditional food supplies, which has been affected by changes in snow cover and sea-ice conditions; lowering of the availability, quality and accessibility of some species; and the melting of permafrost and coastal erosion that present challenges

to community infrastructure. The large social, cultural and economic implications associated with these impacts are slowly becoming better understood. Adaptation programmes and measures are taken at both Federal Government level as well as at the provincial and territorial jurisdiction levels. Many groups at all levels of government, industry partners, non-governmental organizations, and community organizations, are now making the transition from learning about climate impacts to developing actions and adaptation measures.

95. At the Federal Government level, Environment Canada leads horizontal adaptation policy, and coordinates the sharing of tools and best practices across the Federal Government; other relevant ministries are responsible for their sectoral competences. Federal programming is focused on building knowledge and capacity and preparing for action to protect ecosystems, human health, the landscape of Canada's north and its infrastructure, for example, Climate Change and Health Adaptation in Northern First Nation/Inuit Communities; Regional Adaptation Collaboratives; the Heat and Infection Disease Alert and Response System; and innovative risk management tools for adaptation. Canada has also increased its focus on the establishment and effective management of protected areas, particularly in northern Canada to provide natural buffers to the impacts of climate change, including extreme weather events, while also providing other benefits such as protecting biodiversity, supporting tourism and enhancing carbon stores. Provincial and territorial jurisdictions generally command full responsibility in addressing climate change impacts and adaptation in their areas of governance. According to the NC5, Quebec, for example, is proactive despite the uncertainties regarding the scope of climate change impacts that will affect its territory and has already begun implementing adaptation measures in order to minimize risks associated with these impacts, through, inter alia, the programme to reduce urban heat islands in Quebec's municipalities.

96. The NC5 also provides information on Canada's support for a wide range of initiatives on adaptation, including capacity-building activities in developing countries. Canada's cooperation with Parties not included in Annex I to the Convention includes Climate Change Adaptation in Africa, climate change and water, agriculture and food security, environmental economics in several developing countries, through the International Development Research Centre.

97. The ERT commends Canada for its well-organized and systematic approach to identifying climate change impacts and adaptation measures. Concerning reporting, the ERT noted that transparency could be enhanced in several areas by providing further information. For example, the vulnerability of hydropower generation to constraints on water supply, which was highlighted in the NC4, was not discussed in the NC5. During the review, the Party explained that climate change is expected to have significant impacts on hydroelectricity generation in Canada, although the magnitude and even the direction of impacts (positive or negative) varies across the country and in most areas considerable uncertainties remain. The ERT also noted the limited information reported in NC5 regarding integrated coastal zone management. To enhance transparency of reporting, the ERT encourages Canada to further elaborate on its vulnerabilities in all relevant areas and to reflect key adaptation measures by major players in its next national communication.

E. Financial resources and transfer of technology, including information under Articles 10 and 11, of the Kyoto Protocol

1. Provision of financial resources, including “new and additional” resources and resources under Article 11 of the Kyoto Protocol

98. In its NC5, Canada has provided all the required information in accordance with the UNFCCC reporting guidelines, including details of measures taken to give effect to its commitments under Article 4, paragraphs 3, 4 and 5, of the Convention and all information under Article 11 of the Kyoto Protocol, as required by the “Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol”. Canada has further provided information on its financial resources related to the implementation of the Convention provided through bilateral, regional and other multilateral channels. Canada has indicated what “new and additional” financial resources it has provided pursuant to Article 4, paragraph 3, and provided clarification on its definition of the “new and additional” funding by explaining that its contributions to the Global Environment Facility (GEF) are additional to its ongoing development assistance.

99. However, to increase transparency, the ERT requested further clarification on how Canada has determined the “new and additional” financial resources it has provided pursuant to Article 4, paragraph 3, as being “new and additional”. Canada explained that the commitment by developed countries, in the Copenhagen Accord, to provide new and additional financing over 2010–2012, provided Canada with an opportunity to strengthen the transparency of its reporting and to better track the international financing provided to developing countries to adapt to and mitigate against the impacts of climate change (see also para. 104 below). To increase transparency, the ERT encourages Canada to include such further information in its next national communication.

100. Canada has also provided detailed information on the assistance it has made available to developing country Parties that are particularly vulnerable to the adverse effects of climate change to help them meet the costs of adaptation to those adverse effects. Furthermore, Canada has provided information on financial resources related to the implementation of the Convention provided through bilateral, regional and other multilateral channels. In particular, it provided financial resources related to the implementation of the Convention through bilateral, regional and other multilateral channels, including the GEF. Table 7 summarizes the information on Canada’s financial resources.

Table 7
Summary of information on financial resources for 2005–2010

Channel of financial resources	Years of disbursement				
	2005/06	2006/07	2007/08	2008/09	2009/10
World Bank (CAD million)	375.42		392.55	392.55	
International Finance Corporation (CAD million)	10.68		6.08	6.08	
African Development Bank (CAD million)	92.85	88.85	1.5	90.35	
Asian Development Bank (CAD million)	73.27	95.77	29.4	125.17	
European Bank for Reconstruction and Development (CAD million)	3.04		4.99	4.99	
Inter-American Development Bank (CAD million)	3.12		21.48	21.48	
UNDP (CAD million)	130.89		100.50	100.50	

Channel of financial resources	Years of disbursement				
	2005/06	2006/07	2007/08	2008/09	2009/10
UNEP (CAD million)	1.60	1.45		1.45	
UNFCCC (CAD million)	0.75				
GEF (CAD million)	70.32	9.15	36.27	36.27	
Bilateral – Adaptation	3.30 ^a		9.70 ^b		
Bilateral – Mitigation	4.80 ^c	7.10 ^d			15.00 ^e
International Partnership – Adaption		15.00 ^f			11.75 ^g
International Partnership – Mitigation				12.90 ^h	27.00 ⁱ

Note: This table does not include Canada's 2010 Fast Start support.

Abbreviations: GEF = Global Environment Facility; UNDP = United Nations Development Programme; UNEP = United Nations Environment Programme.

^a 2005–2009; ^b 2007–2012; ^c 2002–2010; ^d 2006–2009; ^e 2009–2012; ^f 2006–2012;

^g 2010–2015; ^h 2009–2011; ⁱ 2010–2015.

101. Canada's financial support to address climate change from 2006 to 2009 was primarily delivered through multilateral channels. Canada contributed with CAD 100 million to the World Bank's pilot programme for climate resilience (2008–2009). It also informed the ERT that it was the sixth largest donor to the fourth replenishment of the GEF (GEF-4), contributing CAD 158.9 million over four years (2006–2010), of which approximately one-third is allocated to climate change mitigation.

102. Canada provided information on its committed financial contributions to the fifth replenishment of the GEF (GEF-5) (2010–2014), of CAD 238.4 million of which CAD 18.45 million will be drawn from Canada's fast start funding in 2010. This contribution marks an increase of 50 per cent over Canada's contribution in GEF-4.

103. Canada also carried out significant bilateral activities and international partnerships across a range of adaptation and mitigation activities such as technology transfer, capacity-building, forestry, agriculture and other key sectors. Canada has contributed actively to the UNFCCC Nairobi work programme on impacts, vulnerability and adaptation to climate change, participated in and provided funding to the Least Developed Country Experts Group, and the Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention, supports developing country participation in the Expert Group on Technology Transfer, and is financing the Building Climate Change Adaptive Capacity project in Western Africa, the Caribbean Disaster Risk Management Program and the Climate Change Adaptation in Africa Program.

104. During the review, Canada informed the ERT that in the context of the Copenhagen Accord, Canada provided, and disbursed CAD 400 million in new and additional fast track climate change finance in 2010/2011. Canada's pre-Copenhagen planned climate support was CAD 41 million for the fiscal year 2010/2011. This contribution to fast-track financing addresses both adaptation and mitigation and is directed at vulnerable countries. Among the projects that received funding are: (a) Adaptation – the Least Developed Countries Fund; Climate Change Adaptation in Africa Program; bilateral projects in Haiti, Ethiopia and Viet Nam; and (b) Mitigation – clean energy projects: delivered through the International Finance Corporation; the World Bank's Forest Carbon Partnership Facility's Readiness Fund; and the World Bank's BioCarbon + Fund. Canada focused on identifying activities that are consistent with Canada's vision for an effective long-term climate regime. Canada's priority areas were clean energy, forestry and agriculture, and adaptation. The ERT welcomed Canada's contribution to the fast start financing for 2010 and encourages its continuation.

2. Activities related to transfer of technology, including information under Article 10, of the Kyoto Protocol

105. In its NC5, Canada has provided most of the required information in accordance with the UNFCCC reporting guidelines, including details of measures related to the promotion, facilitation and financing of the transfer of, or access to, environmentally sound technologies. However, the ERT noted that Canada did not provide a clear distinction between activities undertaken by the public sector and those undertaken by the private sector. This information was, however, provided to the ERT during the review and the ERT recommends that Canada enhance the completeness of its reporting by including this information in its next national communication. The ERT also recommends that Canada, to increase transparency of its reporting in the next national communication, further elaborate on the information on its activities for financing access by developing countries to 'hard' or 'soft' environmentally sound technologies; and on information, in a textual format, on steps taken by governments to promote, facilitate and finance transfer of technology and to support development and enhancement of endogenous capacities and technologies of developing countries.

106. Canada engages bilaterally with both developed and developing country partners in sharing knowledge and fostering enabling environments in order to transfer technologies, and has taken steps to assist developing countries directly with their technology needs. For example, the Canadian International Development Agency has undertaken bilateral activities which have included technology transfer projects for climate change development with a capacity-building approach to contribute to sustainable development in developing countries and to help these countries to reduce their emissions of greenhouse gases.

107. The NC5 acknowledges that key challenges remain with respect to supporting technology development in developing countries. These included the need to develop long-term approaches to support technology activities and the need for greater attention to the appropriateness of technology selection, with input from developing countries themselves.

108. Canada's International Development and Research Centre funds the Climate Change Adaptation in Africa Program, which works to establish a self-sustained skilled body of expertise in Africa to enhance the ability of African countries to adapt to the adverse effects of climate change. Through this programme, Canada has been investing CAD 15 million between 2006 and 2012 to ensure that research institutions are better able to assess climate related vulnerability and to develop adaptation options.

109. Canada is a partner to the Asia-Pacific Partnership on Clean Development and Climate (APP), a public-private partnership initiative created to address the issues of sustainable development, clean energy and climate change through the development, deployment and diffusion of clean, efficient and climate-friendly technologies. The approach of the APP emphasizes practical actions in cooperation with the private sector. Canada has committed CAD 20 million to this initiative between 2007 and 2011.

110. Canada also makes use of other bilateral avenues to advance international collaboration, like bilateral science and technology agreements that it signed with several partner countries, including China, the European Union, France, Germany, India, Israel, Japan and the Republic of Korea. These agreements serve as the guidelines for business and government to effectively work with partner countries to increase international science and technology capacity.

F. Research and systematic observation

111. Canada has provided all the required information in accordance with the UNFCCC reporting guidelines including information on its actions relating to research and systematic observation, and addressed both domestic and international activities, its participation in the World Climate Research Programme, the Global Climate Observing System (GCOS) and the Intergovernmental Panel on Climate Change. The NC5 also reflects action taken to support related capacity-building in developing countries. Furthermore, Canada has provided a summary of information on GCOS activities.

112. In its NC5, Canada reports on a number of research activities on climate change impacts and adaptation, including its Research and Systematic Observations Program. However, the ERT noted that Canada did not include information on opportunities for and barriers to free and open international exchange of relevant data and information. During the review, this information was provided to the ERT. The ERT encourages Canada to include such information and to report on the action taken to overcome these barriers in its next national communication.

113. The key federal agencies involved in climate change-related sciences are Environment Canada, Fisheries and Oceans Canada, Natural Resources Canada, and Agriculture and Agri-Food Canada. Other federal departments, including Health Canada and Industry Canada, also contribute to the national knowledge base on climate change. Priorities for climate change research in Canada are determined largely by consultative processes between the above Federal Government departments and academia, with some input from industry and other stakeholder groups. These consultations have led to new funding initiatives and coordinated programmes that have contributed significantly to the systematic observations of the climate system and have helped to improve the scientific understanding of climate change since its NC4.

114. With regard to systematic observations, Canada maintains a national network of climate observing stations extending from coast to coast and into Canada's north. Data gathered at these stations include observations of atmospheric variables, lake and river conditions, ice and snow cover, and the background atmospheric concentrations of GHGs. The networks adhere to the standards set by the World Meteorological Organization and contribute to global observation networks such as GCOS. Canada is a significant contributor to GCOS, the Global Ocean Observing System and the Global Terrestrial Observing System. Contributions include systematic observations, measurements, derived products and data management related to essential climate variables, technical and scientific expertise, and to a lesser extent, financial support.

115. The Canadian Group on Earth Observations, established in 2005, has identified several specific national priorities for such observations, including: soil moisture monitoring, climate modelling and forecasts; integrated planning of monitoring networks and environmental data/products access; and sustained Arctic monitoring programmes. GCOS contributes the climate component to the Global Earth Observation System of Systems. The Meteorological Service of Canada (a division of Environment Canada) is responsible for the national coordination of GCOS activities.

G. Education, training and public awareness

116. In the NC5, Canada has provided information on its actions relating to education, training and public awareness on the national level. The ERT encourages Canada to report further information on formal education, international activities and public participation in the preparation of the communication in its next NC. Canada could focus on the highlights

of its most promising, successful, significant or replicable activities, rather than being comprehensive on all activities.

117. Canada reported that education is the responsibility of the provincial and territorial governments and therefore national activities can only support the different educational curricula. From additional information provided during the review, the ERT noted that provincial climate plans include various education, training and public awareness activities. The Northwest Territories have included climate change in all school-based science curricula, and Ontario, British Columbia and Prince Edward Island plan to do so. Many universities have environmental programmes that include focused climate change courses and/or integrate climate change into environmental management courses, for example, University of Sherbrooke in Quebec and Simon Fraser University in British Columbia.

118. In contrast to the NC4, the Government of Canada now pursues the raising of public awareness that is locally driven and relevant to the area where the target audience lives. The federal programmes reported in the NC4 (the Climate Change Action Fund and the One-Tonne Challenge) were no longer reported in NC5. Instead, the focus of reporting was on several activities by Environment Canada and Natural Resources Canada.

119. Environment Canada reported, for example, on its environmental museum 'Biosphere', which provides comprehensive activities on site but also off site on climate change. It developed unique and innovative educational programmes on climate change and clean air, extreme weather, and sustainable transportation. Natural Resources Canada reported on its comprehensive energy efficiency information activities, which include public awareness campaigns, the labelling of electrical appliances, information pooling, training tools for the public and engagement programmes with provincial and territorial partners. Also, several new GHG certification programmes have been developed (e.g. by the Environmental Careers Organization Canada) to develop the competencies of professionals to measure and verify GHG emissions of different entities (prepared mostly for voluntary reporting).

H. Evaluation of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

120. Canada has provided most of the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol in its NC5. The supplementary information is placed in different sections of the NC5. Table 8 provides an overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol as well as references to the NC5 chapters in which this information is provided.

121. Canada has not reported the following elements of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol: supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17; explicit information on its domestic and regional legislative arrangements and enforcement and administrative procedures that the Party has in place to meet its commitments under the Kyoto Protocol; and a description of national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol also contribute to conservation of biodiversity and sustainable use of natural resources. During the review, Canada provided further relevant information. The ERT recommends that Canada include these reporting elements in its next national communication. The technical assessment of the information reported under Article 7, paragraph 2, is contained in the relevant sections of this report.

Table 8

Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

<i>Supplementary information</i>	<i>Reference</i>
National registry	NC5, chapter 3.6
National system	NC5, chapter 3.5
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Provided during the review
Policies and measures in accordance with Article 2	NC5, chapter 4.7 and 4.8
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	Provided during the review
Information under Article 10	NC5, chapter 7
Financial resources	NC5, chapter 7

I. Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol

122. Canada reported the information requested in section H. Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the annex to decision 15/CMP.1 as part of its 2010 annual submission and further elaborated on it in its 2011 annual submission. It has not reported, however, how it gives priority to the actions taken, in implementing its commitments under Article 3, paragraph 14. During the in-country review, Canada provided the ERT with additional information on how it strives to implement its commitments under Article 3, paragraph 1, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention. The ERT considers the reported information to be broadly transparent and generally complete. The ERT recommends that Canada report on how it gives priority to the actions taken, in implementing its commitments under Article 3, paragraph 14. The ERT also encourages Canada to continue exploring and reporting on the adverse impacts of the response measures.

123. In the annual submissions of 2010 and 2011 and with the additional information provided during the review, the Party explained that Canada, a net exporter of energy, is a trade-dependent economy strongly supportive of open, transparent and rule-based international markets, and has lobbied against possible trade measures that are related to climate change that could affect countries that produce, process and export fossil fuels. The Party also explained that Canada's international support to developing countries through technology transfer and financing for low-carbon growth also reduces vulnerability to the potential adverse economic and social impacts of climate change PaMs by helping developing countries to reduce their dependence on fuel imports and therefore their vulnerability to potential increases in fossil fuel energy import costs due to climate change PaMs.

III. Conclusions and recommendations

124. The ERT concludes that the NC5 generally provides a good overview of the national climate policy of Canada. The information provided in the NC5 includes most mandatory

information required by the UNFCCC reporting guidelines and most elements of the supplementary information under Article 7 of the Kyoto Protocol. During the review, Canada provided additional information on all requested areas so that all mandatory elements were fulfilled.

125. Canada's emissions for 2009 were estimated to be 16.9 per cent above its 1990 level excluding LULUCF and 29.6 per cent above including LULUCF. Emission increases were driven by strong population and economic growth; increasing energy production mostly for exports, mainly unconventional oil (oil sands); the continued reliance on fossil fuels for primary energy supply; and an increase in transport due to freight transport and SUVs. These factors outweighed the decrease in other sectors and by far outweighed the effects of PaMs targeting energy efficiency and renewable energy. The ERT also noted that Canada elaborated on how national circumstances underpin its responses to climate change.

126. In the NC5, Canada presents GHG projections of a 'without measures' and a 'with measures' scenario for the period from 2008 to 2012 that resulted in emission levels in 2010 of 25.1 per cent and 16.3 per cent above base year level respectively. During the review, Canada presented updated projections for these scenarios until 2020. The projected GHG emission levels for the updated projections in 2010 under the 'without measures' scenario and under the 'with measures' scenario are 21.2 per cent and 19.5 per cent above the base year level respectively. Thus, the projections indicate that Canada cannot meet its Kyoto Protocol target (6 per cent reduction relative to base year level) with current implemented domestic actions. LULUCF activities under Article 3, paragraph 3, and those elected under Article 3, paragraph 4, as well as the use of the Kyoto mechanisms are not expected to contribute significantly to meeting the Kyoto Protocol target and plans for further reductions were not reported. The ERT noted with strong concern that on the basis of information provided in its NC5 and during the review, Canada could potentially become non-compliant with its commitments under Article 3, paragraph 1, of the Kyoto Protocol.

127. The NC5 does not contain information on how Canada's use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. During the review, Canada clarified that it is not planning to make significant use of the Kyoto Protocol mechanisms to meet its target under the first commitment period of the Kyoto Protocol.

128. The ERT noted that changes in the policy framework have slowed down the mitigation action in Canada considerably and that some earlier planned PaMs were never implemented and have not yet been fully replaced by other PaMs to achieve equivalent emission reductions. A comprehensive plan from 2007 (Turning the Corner) was replaced in 2009 to align targets and action with the United States for a joint emission trading system, which again was replaced in 2010 for a sectoral regulatory approach, because of the lack of agreement on the emission trading system in the United States. Parallel to these changes, the emission reduction targets decreased in ambition. The target under the Copenhagen Accord, a 17 per cent reduction by 2020 compared with the 2005 level, is less stringent than earlier targets and implies an increase in emissions when compared with the Kyoto Protocol target.

129. Canadian jurisdictions have implemented a number of effective policies at the provincial/territorial level, but the mechanisms to coordinate these policies and/or take stock of the lessons learned from their implementation are not fully explored, which eventually lead to fragmentation and reduced efficiency of the climate change policy. Overall, the PaMs package of Canada was not sufficient to bring its GHG emissions in line with its Kyoto Protocol target. Also, Canada has not demonstrated that implemented or planned measures would be sufficient to reach its Copenhagen Accord target.

130. Canada's financial support for developing countries to address climate change from 2006 to 2009 was delivered primarily through multilateral channels, including contributions of CAD 100 million to the World Bank's pilot programme for climate resilience (2008–2009) and CAD 158.9 million to the GEF-4 (2006–2010). Canada committed CAD 238.4 million to the GEF-5 (2010–2014), marking an increase of 50 per cent over the GEF-4. The ERT welcomed the disbursed CAD 400 million as part of the 2010 fast start financing by Canada and encouraged its continuation. Canada engages bilaterally with both developed and developing country partners in sharing knowledge and fostering enabling environments in order to transfer technologies, and has taken steps to assist developing countries directly with their technology needs.

131. Canada is affected by the impacts of climate change, especially in the Arctic north, and is moving fast towards implementation of adaptation activities. Adaptation programmes and measures are taken at both the federal and the provincial/territorial jurisdiction. Canada also supports a wide range of initiatives on adaptation, including capacity-building activities in developing countries.

132. The ERT noted significant progress in the scientific understanding of climate change since the NC4 and notes the active participation of Canada in the global research activities on climate change. It acknowledges the efforts made by Canada to enhance education, training, public awareness and research and systematic observation.

133. The ERT concluded that Canada's national system continues to perform its required functions as set out in decision 19/CMP.1; that the national registry continues to perform the functions set out in decision 13/CMP.1 and decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant CMP decisions. The ERT noted that updates of database and applications, implemented security measures and changes to the national registry software are documented on a regular basis by nominated responsible persons.

134. Supplementary information under Article 7, paragraph 1, of the Kyoto Protocol on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol provided by the Party in its 2010 and 2011 annual submissions is generally complete and broadly transparent.

135. In the course of the IDR, the ERT formulated several recommendations relating to the completeness and transparency of Canada's reporting under the Convention and its Kyoto Protocol. The key recommendations⁵ are that Canada:

(a) Improve completeness of reporting by including in the next national communication the following information:

- (i) National circumstances for the agriculture and forestry sectors;
- (ii) PaMs in tabular format by gas, and for all sectors, including agriculture, forestry and waste sectors;
- (iii) Information on how Canada believes its PaMs are modifying longer term trends in anthropogenic GHG emissions;
- (iv) Emission projections presented relative to actual inventory data for the preceding years, and on a sectoral and gas-by-gas basis;
- (v) Relevant factors and information on activities by sector for the years 1990–2020 relevant for projections;

⁵ The recommendations are given in full in the relevant sections of this report.

- (vi) A clear distinction between activities related to technology transfer undertaken by the public sector and those undertaken by the private sector;
- (vii) Information on domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures established pursuant to the implementation of the Kyoto Protocol, including a description of how implementation of activities under Article 3, paragraph 3, and elected activities under Article 3, paragraph 4, also contribute to the conservation of biodiversity and sustainable use of natural resources;
- (viii) Information on complementarity relating to the mechanisms pursuant to Articles 6, 12 and 17;
- (ix) Information on how it gives priority to the actions taken in implementing its commitments under Article 3, paragraph 14, of the Kyoto Protocol;
- (b) Improve the transparency of reporting by:
 - (i) Ensuring that PaMs are reported under the respective sectors;
 - (ii) Ensuring that the reported 'with measures' scenario encompasses currently implemented and adopted PaMs;
 - (iii) Elaborating further on its activities for financing access by developing countries to 'hard' or 'soft' environmentally sound technologies and on steps taken to promote, facilitate and finance the transfer of technology, and to support the development and enhancement of the endogenous capacities and technologies of developing countries.

136. The ERT encourages Canada to undertake a number of improvements regarding transparency and completeness of reporting by moving beyond the bare minimum required by the guidelines; the most important of these are that the Party:

- (a) Provide a comparison with disaggregated indicators of other Parties with similar national circumstances to enhance understanding of how national circumstances are relevant to factors affecting GHG emissions;
- (b) Clearly indicate its GHG reduction targets;
- (c) Indicate which PaMs presented in the previous NC are no longer in place, and refer to the previous NC in case the PaM has remained unchanged since then;
- (d) Highlight those PaMs that are innovative and/or effectively replicable by other Parties;
- (e) Report on the planned PaMs which will enable Canada to reach its targets using a 'with additional measures' scenario;
- (f) Further clarify how the "new and additional" financial resources it has provided pursuant to Article 4, paragraph 3, of the Convention, were determined to be "new and additional".

IV. Questions of implementation

137. During the review, the ERT assessed the NC5, including supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol and reviewed information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, with regard to timeliness, completeness and transparency. No question of implementation was raised by the ERT during the review.

Annex

Documents and information used during the review

A. Reference documents

“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications”. FCCC/CP/1999/7. Available at <<http://unfccc.int/resource/docs/cop5/07.pdf>>.

“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories”. FCCC/CP/1999/7. Available at <<http://unfccc.int/resource/docs/cop5/07.pdf>>.

“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol”. Decision 15/CMP.1. Available at <<http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=54>>.

“Guidelines for review under Article 8 of the Kyoto Protocol”. Decision 22/CMP.1. Available at <<http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=51>>.

FCCC/SBI/2011/INF.1. Compilation and synthesis of fifth national communications. Available at <<http://unfccc.int/resource/docs/2011/sbi/eng/inf01.pdf>>.

FCCC/SBI/2011/INF.1/Add.1. Compilation and synthesis of fifth national communications, Add.1: Policies, measures, and past and projected future greenhouse gas emission trends of Parties included in Annex I to the Convention. Available at <<http://unfccc.int/resource/docs/2011/sbi/eng/inf01a01.pdf>>.

FCCC/SBI/2011/INF.1/Add.2. Compilation and synthesis of fifth national communications, Add.2: Financial resources, technology transfer, vulnerability, adaptation and other issues relating to the implementation of the Convention. Available at <<http://unfccc.int/resource/docs/2011/sbi/eng/inf01a02.pdf>>.

FCCC/SBI/2011/INF.2. Compilation and synthesis of supplementary information incorporated in fifth national communications submitted in accordance with Article 7, paragraph 2, of the Kyoto Protocol. Available at <<http://unfccc.int/resource/docs/2011/sbi/eng/inf02.pdf>>.

FCCC/ARR/2009/CAN. Report of the individual review of the annual submission of Canada submitted in 2009. Available at <<http://unfccc.int/resource/docs/2010/arr/can.pdf>>.

FCCC/IRR/2007/CAN. Report of the review of the initial report of Canada. Available at <<http://unfccc.int/resource/docs/2008/irr/can.pdf>>.

FCCC/IDR.4/CAN. Report on the in-depth review of the fourth national communication of Canada. Available at <<http://unfccc.int/resource/docs/2009/idr/can04.pdf>>.

Canada’s fourth national report on climate change. Available at <<http://unfccc.int/resource/docs/natc/cannc4.pdf>>.

2009 GHG inventory submission of Canada. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/4771.php>.

2010 GHG inventory submission of Canada. Available at
<http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5270.php>.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Sally Garden and Ms. Judith Gelbman (Environment Canada), including additional material on updated policies and measures, GHG projections, the national registry and recent climate policy developments in Canada. The following documents¹ were also provided by Canada:

Environment Canada. 2001. *A Climate Change Plan for the Purposes of the Kyoto Protocol Implementation Act*. Ottawa.

Indian and Northern Affairs Canada. 2010. *Sharing Knowledge for a Better Future. Adaptation and clean energy experiences in a changing climate*. Ottawa.

Natural Resources Canada. 2011. *Energy use, data handbook*. Ottawa.

Natural Resources Canada. 2010. *Improving Energy Performance in Canada. Report to the Parliament under the energy efficiency act for the fiscal year 2008-2009*. Ottawa.

¹ Reproduced as received from the Party.

Communications Advisory Note
(for reports and publications)

REPORT TITLE:

United Nations Framework Convention on Climate Change (UNFCCC) In-Depth Review of Canada's Fifth National Communication Report (NC5)

PLANNED RELEASE DATE: The report will be published the first week of November, 2011 (TBC) on the UNFCCC website.

ISSUE:

As an Annex I Party to UNFCCC and the Kyoto Protocol, Canada is required to submit a National Communication Report every four years describing the steps being taken to implement its commitments under the UNFCCC and the Protocol.

Canada's NC5 was submitted in February 2010. In May 2011, a UNFCCC Expert Review Team (ERT) visited Ottawa to undertake an in-depth review of the report, and Canada's climate change action. Following the in-depth review, the ERT drafted a comprehensive report assessing the completeness, transparency and accuracy of Canada's reporting and compliance with UNFCCC commitments. The report of the in-depth review of Canada's NC5 will be published online, on the UNFCCC website, and may garner media attention.

There are media lines in this document that address any potential criticisms related to elements of the report including:

- The conclusion that Canada could potentially become non-compliant with its commitment under the Kyoto Protocol to reduce greenhouse gas emissions by 6% from 1990 levels.
- The statement that Canada has no federal plan or strategy to meet its Copenhagen target.
- The statement that Canada abandoned the 2007 Turning the Corner plan in order to align with the United States.
- The finding that Canada's submission of its NC5 report was delayed.
- The finding that Canada did not provide all mandatory information in the NC5 submission (although all information was provided in the subsequent review).

It is anticipated that the release of the NC5 report could receive media attention. Only one media request, from iPolitics.ca, was received when Canada submitted its NC5 in February 2010. However, given the conclusions about the Kyoto target included in the NC5, it is possible that media interest levels may rise.

Communications proposes a reactive approach to any media requests with the following messaging.

KEY MESSAGES:

- The Government of Canada is committed to accountability and transparency.

- During the review process, Canada provided the UNFCCC with comprehensive information on the progress we have made towards meeting our commitments under the UNFCCC and Kyoto Protocol.
- We have taken action domestically and internationally to address climate change.
- Domestically, we have started with transportation and electricity – the two largest sources greenhouse gas emissions in Canada – and we will continue to proceed to address emissions from other major-emitting sectors.
- Internationally, Canada continues to be actively engaged in the international negotiations aimed at developing a new, fair and effective international post-2012 climate change regime.
- The in-depth review report clearly states that all mandatory reporting requirements were fulfilled.
- The Expert Review Team (ERT) commended Canada for improved reporting in many sections of the National Communications document including policies and measures. We were also commended for taking into consideration the recommendations provided in the review report of Canada's NC4.

In response to criticism that Canada could become non-compliant with certain commitments under the Kyoto Protocol:

- Under the Kyoto Protocol, compliance with commitments is not determined until after the end of the first commitment period in 2013.
- As an international agreement, the Kyoto Protocol has proved insufficient to address global climate change. This is why Canada will not take a target under a second commitment period of the Kyoto Protocol.
- In particular, the rules of the Protocol have not taken into account specific national circumstances and have disadvantaged many countries, including Canada.
- Moreover, the Protocol does not include commitments by the U.S. and China, which together are responsible for around 40 percent of global emissions.
- The Cancun Agreements, on the other hand, form a solid basis for an effective global post-2012 regime that includes all major emitters.
- Unlike the Kyoto Protocol, the Cancun Agreements are more comprehensive and include action on adaptation, support for the climate change actions of developing countries, reducing emissions from deforestation, and promoting technology development and transfer.
- For this reason, Canada supports the establishment of a new international climate change agreement that includes commitments by all major global emitters. This is the only way to achieve real reductions in global emissions.

In response to criticism that Canada has no federal plan or strategy to meet its Copenhagen target:

- Federal measures, combined with actions taken by provinces and territories, have brought us one quarter of the way towards our 2020 greenhouse gas emission reduction target.
- We have achieved this through a sector-by-sector approach aligned with the U.S., where appropriate as per our Copenhagen Accord commitment.

- In the transportation sector, the largest single-source of emissions in Canada, we have worked collaboratively with the U.S. towards common North American standards for greenhouse gas emissions from vehicles, and have published final regulations for light duty vehicles for the 2011-2016 model years. We are also working together to do the same for heavy-duty vehicles.
- Canada is working with the U.S. to develop tighter standards for new passenger automobiles and light trucks of the 2017 and later model years and to maintain a common approach to regulating in this area.
- We are working to regulate coal-fired electricity generation. We have recently released proposed regulations, which will apply a stringent performance standard to new coal-fired electricity generation units and those coal-fired units that have reached the end of their economic life. This will lead to significant reductions in GHG emissions, and improve air quality for Canadians from coast to coast to coast.
- We are also following through on our commitment to regulate renewable content in the fuel supply. As of December 15, 2010, gasoline is required to contain an average five per cent renewable content. These regulations are one pillar of the Government's broader Renewable Fuels Strategy. As a further step, we have implemented a 2 per cent renewable fuel requirement for diesel fuel.
- These federal measures combined with actions taken by provinces have brought us one quarter of the way towards our 2020 target.

In response to statement that Canada abandoned the 2007 Turning the Corner plan to align with the U.S.:

- We support an approach to climate change that achieves real environmental and economic benefits for all Canadians.
- Given the highly integrated nature of the North American economy, this includes aligning our climate policies with the United States.

In response to criticism that Canada was delayed in submitting the NC5 report:

- The UNFCCC reporting process allows for a submission grace period of six weeks. Canada was granted a six week extension, and submitted the report within the grace period, on February 12, 2010.
- Canada requested this extension in order to ensure the most up-to-date national and provincial/territorial data and actions were included, as well as to ensure the report accurately reflected outcomes from recent international meetings.

In response to criticism that certain information was not provided in the NC5 report:

- The in-depth review report clearly indicates that all mandatory reporting elements were fulfilled.
- Further information was provided to the ERT during the in-depth review that took place in Ottawa in May 2011, to the satisfaction of the reviewers.
- The report, "Canada's Emissions Trends", released by Environment Canada in July

2011, addresses many of the comments and missing reporting elements raised by the ERT in their review.

DESIGNATED SPOKESPERSON:

Media Relations
Environment Canada
819-934-8008

SUMMARY OF THE FINDINGS IN THE REPORT:

- The report concludes that the information provided in Canada's NC5 included most mandatory information required by UNFCCC reporting guidelines and that during the review Canada provided additional information on all requested areas so that all mandatory elements were fulfilled.
- The report states that emissions projections indicate that Canada cannot meet its Kyoto Protocol target with current implemented domestic actions. The ERT noted with strong concern that, on the basis of information provided on its NC5 and during the review, Canada could potentially become non-compliant with its commitments under the Kyoto Protocol to reduce greenhouse gas emissions by 6% from 1990 levels.
- The report also finds that Canada has no federal plan or strategy to meet its Copenhagen target.
- The report also states that Canada abandoned the 2007 Turning the Corner plan in order to align with the United States.
- A number of detailed recommendations for Canada to take into consideration during the preparation of future National Communications reports were outlined in the report including a recommendation to move beyond 'bare minimum' reporting and provide additional detail on national circumstances, policies and measures, and GHG reduction targets.

BACKGROUND:

Under Article 12 of the UNFCCC, and Article 7(2) of the Kyoto Protocol, Canada is required, as an Annex I Party, to submit a National Communication Report to the UNFCCC Secretariat every four years.

The Report must describe Canada's national circumstances and the actions it has taken to meet its obligations under the UNFCCC and the Kyoto Protocol. The report must also provide:

- Information regarding the national circumstances relevant to greenhouse gas emissions and removals.
- Greenhouse gas inventory information.
- Information relating to policies and measures to address climate change.
- Emissions projections and projections of the total effect of policies and measures in place.
- A vulnerability assessment, and information regarding climate change impacts and adaptation.
- An overview of financial resources and transfer of technology;

- Information relating to climate change research and systematic observation.
- Information regarding climate change education, training and public awareness.

In compliance with UNFCCC rules, Canada requested a six-week extension for the submission of its NC5, beyond the January 1st, 2010 deadline. On December 24, 2009, Canada notified the UNFCCC Secretariat in writing of the delay and submitted the final NC5 on February 12, 2010.

The in-depth review of Canada's NC5 took place in Ottawa on May 16-21, 2011. The review was conducted by a visiting ERT, and consisted of a series of presentations and discussions with officials on the broad range of issues covered by the National Communication.

Following the review, the ERT drafted a comprehensive report assessing the completeness, transparency and timeliness of Canada's NC5, as well as Canada's compliance with UNFCCC and Kyoto Protocol commitments. The report provided a technical assessment of the information presented in the NC5, and of the supplementary material provided during or after the review process.

Canada received a copy of the draft in-depth review report on August 24, 2011, and was given four weeks to provide comments on the draft report. Environment Canada worked closely with other departments including Natural Resources Canada, Agriculture Canada, Finance Canada and the Department of Foreign Affairs and International Trade. Canada's detailed comments were compiled and submitted to the UNFCCC Secretariat on September 21, 2011. Canada's comments mainly addressed outdated language, small inaccuracies, and provided additional clarity on some issues.

The ERT will take Canada's comments into consideration when preparing the final report, which is due to be completed by October 19, 2011. Canada will receive a final draft of the report at that time. The UNFCCC Secretariat has advised that a further round of comments on the draft is not foreseen. However, if Canada has any concerns, there will be the possibility of requesting amendment or clarification. Once Canada has approved the draft it will go forward for final editing and publication. The final report will also be forwarded to the Compliance Committee.

Prepared by:
Lindsay Valente
819-953-8772



Natural Resources
Canada

Ressources naturelles
Canada

Deputy Minister

Sous-ministre

Ottawa, Canada
K1A 0E4

N12-127332

MEMORANDUM TO THE MINISTER

MAR 12 2012

**CONTINUATION OF CLEAN ENERGY FUND
PROGRAM'S TERMS AND CONDITIONS TO 2016:
COST-BENEFIT ANALYSIS OF CARBON CAPTURE AND STORAGE**

(Approval Sought)

SUMMARY

- This memorandum seeks your approval to amend the terms and conditions of the Clean Energy Fund (CEF) to extend this program by two and a half years, from March 31, 2014, to October 31, 2016.
- This memorandum also provides additional information on the cost and benefits of carbon capture and storage (CCS), as you had requested.
- Large-scale CCS demonstration projects represent the largest component of the CEF. The schedule of these projects has slipped due to a number of factors, including regulatory and economic uncertainties, leading to this request to extend the program. Several CCS demonstration projects cannot be delivered without program extension.
- The CEF also has a component of small-scale demonstration of integration of renewable energy. One of the nineteen projects requires program extension to proceed.

s.21(1)(a)

s.21(1)(b)

s.21(1)(c)

- As Minister, you have the authority to approve an amendment to the terms and conditions of the CEF to extend its duration. No additional funds are required to deliver the program.
- The economics of CCS have not yet been demonstrated on a large scale. It has the potential to deliver significant greenhouse gas (GHG) emissions reductions in oil sands production and upgrading, natural gas processing, coal-fired electricity production, as well as in several other industrial sectors.
- Given the potential for significant GHG reduction benefits from this technology, it is imperative to explore it, which is best accomplished by large-scale demonstrations as a necessary step towards potential cost-effective implication.

BACKGROUND

Clean Energy Fund

The CEF was announced in Budget 2009 as a \$1-billion (B) investment in clean energy research and demonstration projects. Its principal focus, with a \$600-million (M) investment, was large-scale CCS demonstration projects to help Canada reduce its GHG emissions and produce more clean electricity. Four CCS projects were selected. Three are co-funded by Alberta. Two were announced by your predecessor and colleague, the Honourable Lisa Raitt. One project, TransAlta's Project Pioneer, was announced by the Prime Minister.

TransAlta's Project Pioneer in Alberta, one of two CCS demonstration projects at coal-fired electricity generating facilities in Canada. It has received \$27M from the ecoENERGY Technology Initiative and a funding commitment of \$315.8M from the CEF. The project is co-funded with Alberta, which is contributing \$431M from the Alberta CCS Fund and \$5M from the Alberta ecoTrust Fund. The project also received \$5M from the Global Carbon Capture and Storage Institute in 2010.

s.20(1)(b)

s.20(1)(c)

s.21(1)(b)

The City of Yellowknife's project, under the demonstration component of the CEF, was one of 19 projects selected for funding and at \$14M was one of the largest awards. The City of Yellowknife's initial plans to finance this project could not proceed, but it now has an agreement with Corix Utilities to provide funding for the project.

This project is seen as a very worthwhile one for NRCan to support, given the proposed scale of use of renewable energy for a northern community.

All three projects could be completed within the timeframe proposed by this program extension.

Carbon Capture and Storage Costs and Benefits

You have requested an additional cost-benefit analysis of CCS to complement a previous memorandum (see Docket N11-125255 under Attachment 1) seeking your approval of the continuation of the CEF program's terms and conditions, to allow program extension to 2016.

CCS is not currently economically viable. Canada has committed to exploring CCS technology, given its potential to significantly reduce GHG emissions in this country. The role of CCS and the current cost/benefits are described in Attachment 2.

International Efforts

As identified in Attachment 2, CCS is viewed internationally as a key and necessary instrument to meet GHG emission reduction targets by 2050.

The G8 set a goal of having 20 large-scale demonstration projects in operation world-wide by 2020, which is consistent with what other international forums, such as the Major Economies Forum and the Clean Energy Ministerial, are also urging for CCS.

Canada is among the world leaders for meeting this goal. Federal commitments of approximately \$1B in funding over the past five years for CCS, plus \$2B from the governments of Alberta, Saskatchewan and B.C., are expected to leverage an equal amount of private investment for up to six large-scale demonstration projects that could result in up to 8 megatonnes of emissions reductions from CCS by 2016.

The Role of Large-Scale Demonstrations

CCS has reached the stage where large-scale demonstration projects are now required for reducing the risks and costs of adopting the technology. These demonstrations have triggered efforts to address the legal, regulatory and commercial barriers, and fostered public outreach to gain public acceptance for CCS. Efforts on all these fronts are required to accelerate technology adoption and deployment on a commercial basis.

Canada is gaining direct experience with the technology and on confirming safe and viable geological storage opportunities in Canada. This country is in a unique position to benefit from CCS because of the proximity of point-source emitters to abundant geological storage, and because of the applications of CCS to different sectors, including oil sands production and refining, natural gas processing, electricity generation from coal and gas, enhanced oil recovery and industrial chemical processing, such as fertilizer production.

At the same time, Canada will need to contribute to and rely on the combined experience acquired from multiple projects around the world. Accelerating the current demonstration phase requires an overall global effort.

Demonstration projects also provide valuable information as other public policy and regulatory decisions are being considered. This includes the Government of Canada's sector-by-sector approach to regulating GHG emissions, [REDACTED] and business case for future CCS projects.

s.21(1)(a)

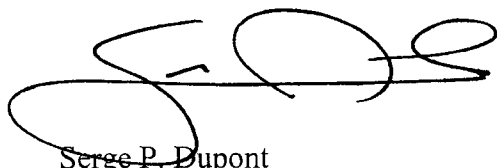
Without programs such as the CEF and provincial funding programs such as Alberta's \$2B CCS Fund, the financial, technical and regulatory risks are too high for industry to invest in CCS projects, and this critical phase of demonstrating the technology in Canada would not proceed.

Amendment of the Terms and Conditions of the CEF

The current authority for contribution payments under the CEF program ends on March 31, 2014. Extending the terms and conditions by two and half years to allow this authority to end on October 31, 2016, will enable key projects funded under the CEF to be successfully completed where their timelines extend beyond the current authority. Furthermore, approving the extension by no later than March 31, 2012, will allow the program to adjust the necessary contribution agreements expeditiously and limit uncertainty on the part of project proponents.

RECOMMENDATION

It is recommended that you approve the continuation of the terms of conditions of the CEF program by two and a half years, to October 31, 2016. We are available to discuss the cost-benefit analysis and the role of large-scale CCS projects in exploring the deployment of this technology in Canada, given its significant potential.



Serge P. Dupont

Attachments: (2)

Contact: Marc D'Iorio, 613-947-1222

Office of Energy Research and Development, ES

I agree ☐

I disagree ☐

I wish to discuss ☐

The Honourable Joe Oliver, P.C., M.P.



Natural Resources
Canada

Ressources naturelles
Canada

Deputy Minister

Sous-ministre

Ottawa, Canada
K1A 0E4

MINISTER'S OFFICE	
Kelly	
NOV 22 2011	
Cocket #	125255
File #	6600-26

PROTECTED 'A'

N11-125255

NOV 22 2011

MEMORANDUM TO THE MINISTER

**APPROVAL OF THE CONTINUATION OF
THE TERMS AND CONDITIONS OF THE CLEAN ENERGY FUND**

(Approval Sought)

SUMMARY

- This memorandum seeks your approval to continue the terms and conditions of the Clean Energy Fund (CEF) program for two and a half additional years, to end on October 31, 2016. The overall spending amount will remain unchanged.
- In parallel with this request, NRCan is also requesting that \$86 million (M) be reprofiled from prior years to 2014–2015, which is one extra year beyond the current authority, as part of the 2012–2013 Annual Reference Level Update (ARLU) process.
- These two processes will enable key projects funded under the CEF program, including TransAlta's Project Pioneer, to be successfully completed and meet federal stacking requirements. Without this continuation, the projects' recipients and private-sector partners would not be able to make co-funding contributions to the projects; the federal contribution would be in excess of 50 percent of total project cost and thus would not meet federal stacking requirements.

BACKGROUND

The \$795-M CEF program was announced as a five-year program as part of Budget 2009. The CEF program has three major components: 1) large-scale carbon capture

Canada

and storage (CCS) demonstration (\$610M); 2) smaller scale renewable and clean energy demonstration (\$150M); and 3) research and development contribution payments allowed under the first two components of the program.

During the fall of 2009, the Prime Minister and the Minister of Natural Resources announced the allocation of funding to three large-scale CCS demonstration projects in Alberta. These three projects are being co-funded with the \$2-billion (B) Alberta CCS Fund, which has contributed \$1.671M towards these projects.

The current authority for contribution payments under the CEF program ends on March 31, 2014.

Section 6.3.1 of the 2008 Treasury Board's (TB) Policy on Transfer Payments gives you the authority to approve the terms and conditions of a continuation of program. The NRCan Centre of Expertise on Grants and Contributions and the Treasury Board Secretariat have informed NRCan that the amendment which we are seeking is considered a minor change.

CONSIDERATIONS

This request for continuation of the terms and conditions of the CEF program for two and a half additional years, to October 31, 2016, is specifically requested so that certain projects, which have received funding commitments from the program and which have experienced some delays, can be successfully completed and meet federal stacking requirements. This continuation would enable the end dates for the projects in question to be extended to October 31, 2016, which is in line with current project plans.

In parallel with this request, NRCan is also requesting that \$86M be reprofiled from prior years to 2014–2015, which is one extra year beyond the current authority, as part of the 2012–2013 ARLU process. For your information, the reprofiling request to TB is provided under Attachment 1. A decision regarding this reprofiling request is expected in early December 2011.

At the moment, two projects require that the end dates be extended, as would enable this continuation: 1) TransAlta's Project Pioneer, a \$1.3-B large-scale CCS project which has received a commitment of \$315.8M from the CEF; and 2) the City of Yellowknife's \$60-M Mine Heat and Northern District Energy System project, which has received a \$14.15-M commitment from the CEF program. It is possible that, in the future, other CCS and clean and renewable energy projects would require an extension of project

end dates, and the additional timeframe enabled under this continuation would be available to them as well, so that all recipients would be treated in the same way.

The extension of project end dates is required for two reasons: 1) to enable funding to be provided to projects in 2014–2015 (if the reprofiling request referenced above is approved); and 2) to allow sufficient time for recipients and other project partners, including the Province of Alberta in the case of TransAlta's Project Pioneer, to make co-funding contributions to the project. This will enable the project to meet the federal stacking requirements. The reason that the private sector and other partners cannot make co-funding contributions earlier has to do with the timing of major expenditures of the projects, which are weighed — as in the case of most large capital projects — towards the back end of projects.

If both the reprofiling request and this continuation are approved, then NRCan will be able to enter into contribution agreements with recipients to reflect an extension of the project end date. The above administrative processes, which are undertaken in response to recipients' requests and based on latest project plans, will increase the probability that these projects are successfully implemented.

The project delay, in the case of TransAlta's Project Pioneer, is due to: a) [REDACTED]

s.21(1)(a) [REDACTED]

s.21(1)(b) [REDACTED]

s.21(1)(c) [REDACTED]

TransAlta plans to make up for this delay over the next few years and to start up the CCS system by December 2015, as per the original plan. Additional information on the rationale for this continuation is provided under Attachment 2.

As a related matter, in September 2011, you approved the continuation of the terms and conditions of the ecoENERGY Technology Initiative. That request, which was also in support of TransAlta's Project Pioneer and other projects, was circulated for essentially the same reasons as this request.

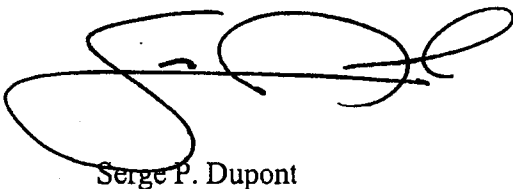
The approved Chief Financial Officer Attestation, signed by Mr. Bill Merklinger, Chief Financial Officer and Assistant Deputy Minister of the Corporate Management and Services Sector, is provided under Attachment 3.

Attachment 4 provides fact sheets for the TransAlta Project Pioneer and the City of Yellowknife project.

The NRCan Centre of Expertise on Grants and Contributions has confirmed that the amendments that we are seeking are within your authority.

RECOMMENDATION

It is recommended that you approve continuation of the terms and conditions of the CEF program by two and half years, to October 31, 2016.



Serge P. Dupont

Attachments: (4)

Contact: Bill Merklinger, 613-995-4252
Chief Financial Officer and Assistant Deputy Minister, CMSS

I agree ☐
I disagree ☐
I wish to discuss ☒


The Honourable Joe Oliver, P.C., M.P.

Date: Dec 5, 2011

s.21(1)(b)



REPROFILE REQUEST

1. Program Details and Relevant Considerations

A. Name of Initiative for which reprofiling is sought Clean Energy Fund (CEF) program	B. Department / Agency Department of Natural Resources Canada (NRCan)
C. Is this item funded from the Economic Action Plan? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	D. Indicate the original source of funds (e.g., Budget 2009, cabinet decision, etc.) and whether the funding is ongoing. Source: Budget 2009 Ongoing: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
E. If a reprofile request for this item has been made previously, indicate when and whether it was approved. Leave this section blank if a request has not been made in the past. When: 2011-12 ARLU Approved: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
F. Provide a detailed explanation of how the reprofiled funds are required to meet legal or other non-discretionary obligations. The reprofiling requests below are required in order to move forward and conclude negotiations on 3 contribution agreements for 3 clean energy demonstration projects. The Prime Minister announced the signing of the Letter of Intent committing \$315.8M in CEF funding and \$27M in ecoETI program funding to TransAlta's Project Pioneer, one of 4 large-scale carbon capture & storage (CCS) demonstration projects being supported by the CEF, [redacted] renewable energy project, which will be amended, if this reprofiling request is approved.	
G. Provide a detailed explanation of what has created the need for the reprofile (e.g. project / contracting delay, external negotiations, early demand for program etc.) and outline what corrective actions, if any, will be required to address the issue in addition to the reprofile. This reprofiling request is primarily due to delays experienced by large-scale CCS demonstration projects. These delays are due mostly to factors that are external to NRCan, including: [redacted] delays in securing partner funding commitments, and technological uncertainty. The delays are not unreasonable for demonstration projects of this type and approval of this reprofiling request will help reduce risk and ensure that these projects can be successfully implemented. CCS is a core plank of the Government of Canada's approach to climate change and to messaging with regards to oil sands and industry efforts to implement measures to address environmental issues. To date, the CEF has allocated funding to 4 large-scale CCS and 19 renewable & alternative energy demonstration projects. All of the CCS and 16 of the 19 renewable energy projects have started and most of the projects are on schedule. Three important projects are delayed by up to 12 months, and require reprofiling of funds to 2014-15, to match the needs of recipients. The 3 projects are: 1) TransAlta's Project Pioneer (CCS, \$1.3B total project cost, CEF: \$315.8M) [redacted] 3) City of Yellowknife project (renewable energy, \$80M total project cost, CEF: \$14.2M). [redacted] The Spectra CCS project was delayed in waiting for provincial funding. Significant progress has been made to address the above issues and NRCan believes that, with the reprofiling of funds requested, there is a high probability that these 3 projects can be successfully completed. While earlier ARLU requests were based on limited information on specific project forecasts, the current reprofiling request reflect the recipients' up-to-date information that will be included in the contribution agreements.	
H. Provide a detailed explanation of why the funding requirement cannot be addressed using available funding? The CEF is requesting that \$177 million be reprofiled from 2011/12 and 2012/13 to 2013/14 and 2014/15, which is an extra year beyond the current program timeframe. If this request for reprofiling is approved, then the CEF will also seek Ministerial approval for the continuation of the terms & conditions of the program to enable contributions to be disbursed in the additional year (2014-15). Given the materiality of the required adjustment, there is no other reasonable means to address the requirement internally within the Department.	
I. Can your organization's Operating Budget Carry Forward or Capital Budget Carry Forward be used to address the funding requirement? If not, detail why. Not applicable, as this reprofiling request relates to Vote 10 funding.	
J. Identify any outstanding conditions associated with the funding or related projects, or other relevant considerations such as provincial/territorial and regional issues. The TransAlta project is 1 of 3 projects being co-funded by the CEF and the province of Alberta's \$2B CCS Fund. Alberta has allocated \$436M to the TransAlta project. The Yellowknife project is an important and sizable renewable energy project in the Northwest Territories.	
K. If the reprofile is not approved, what alternate approaches and contingencies are being considered to address the issue? The CEF's participation in either TransAlta's Project Pioneer (in Alberta) [redacted] would have to be terminated, which would very likely lead to the cancellation of the projects by the private sector proponents given the size of the federal contribution, and the Yellowknife project would have to be amended to reduce the scope of the project. The CCS projects target 2 key application areas: coal-fired electricity [redacted] Each project is expected to contribute up to 1 Million tons of reductions of CO2 emissions per year or more. Not proceeding would mean that the GDP impact, jobs and CO2 emission reductions would not be realized. The CEF CCS projects have very high visibility, both in Canada and internationally, and contribute to Canada's global leadership in CCS. NRCan has made significant progress in working with the recipients, and province of Alberta in TransAlta's case, to developing workplans to successfully complete the projects and make up for the delays, which are not unusual for demonstration projects. Not proceeding would require senior officials and the Minister's intervention to convey the decision and mend relations with proponents and with Alberta in particular. The Yellowknife project is a highly visible northern project and is the only small-scale demonstration project in the Northwest Territories. Implementing alternative energy solutions using geothermal and biomass can help northern communities reduce their reliance on imported diesel and thereby reduce GHG's in Canada's north.	

s.21(1)(a)

s.21(1)(b)

s.21(1)(c)

**2. Funding Profile****CURRENT FUNDING PROFILE**

Vote 1 (Sal EBP O&M)	13,941.5	22,990.5	7,990.5	7,990.5	0.0	52,913.0	
Vote 10 (Contributions)	108,000.0	141,800.0	279,800.0	191,600.0	0.0	720,800.0	
PWGSC	58.5	409.5	409.5	409.5	0.0	1287.0	
TOTAL	122,000.0	165,000.0	288,000.0	200,000.0	0.0	775,000.0	

PROPOSED REPROFILE

Vote 1 (Sal EBP O&M)							
Vote 10 (Contributions)		-55,000.0	-122,000	91,000	86,000	0.0	
PWGSC							
TOTAL		-55,000.0	-122,000	91,000	86,000	0.0	

Does the reprofile request have an accrual impact? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>If "Yes", indicate both the associated cash and accrual profiles in the "Reprofile" tab of the worksheet.</i>
Does this request include personnel funds (i.e. salary dollars)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>If "Yes", please note that the request should not include EBP amounts if it is a reference level reprofile.</i>
Are the reprofiled funds in a Special Purpose Allotment (SPA)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>If "Yes", please name the SPA:</i>
Are the reprofiled funds in a frozen allotment? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>If "Yes", please name the frozen allotment:</i>

3. TBS Program Sector Recommendations and Comments*(To be completed by TBS Program Sector)*

A. TBS Sector Contacts (Program Analyst and Sector Names)	B. Does TBS Program Sector support the reprofile request? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Partial
C. Summary of TBS Recommendations	

**Deputy Chief Financial Officer Attestation
Request for Approval by the Minister of a Continuation, Minor
Amendment(s) or Exception(s) to Terms and Conditions**

Lead Department/Agency

Natural Resources

A/Deputy Chief Financial Officer

Thérèse Roy, CA

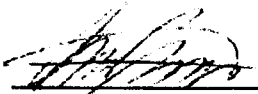
Title of Program

Clean Energy Fund

Attestation:

I have reviewed the transfer payment authorities requested in this request. I am satisfied that they comply with the Treasury Board Policy on Transfer Payments.


Recommended:



**Chris Szwarc
Director – Grants, Contributions & Revenue Generation**

date: NOV. 1/2011

Approved:



**Thérèse Roy, CA
A/ Deputy Chief Financial Officer**

Date: NOV. 1, 2011

Chief Financial Officer Attestation
Request for Approval by the Minister of a Continuation, Minor
Amendment(s) or Exception(s) to Terms and Conditions

- ☒ Continuation under Section 6.3.1 of the Policy on Transfer Payments
- ☐ Minor Amendment under Section 6.3.2 of the Policy on Transfer Payments
- ☐ Exception under 6.3.6 of the Policy on Transfer Payments

Lead Department/Agency

Natural Resources

Chief Financial Officer

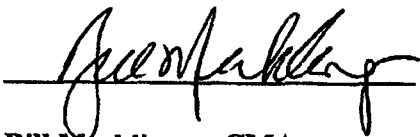
Bill Merklinger, CMA

Title of Program

Clean Energy Fund

Attestation:

I have reviewed the transfer payment authorities requested in this request. I am satisfied that they comply with the Treasury Board Policy on Transfer Payments.



Bill Merklinger, CMA
ADM, CMSS, CFO

Date: Nov 3 / 11

Continuation of the Clean Energy Fund (CEF) program Terms & Conditions

Rationale & Justification

- This request for a continuation for 2½ additional years to October 31, 2016, is specifically requested so that certain projects funded by the CEF program, who have experienced some delays, can be completed and meet co-funding and stacking requirements.
- There are 2 federal stacking requirements that must be met by projects funded by the CEF program: 1) the federal contribution must be 50% or less of total project cost and 2) total contributions provided by all orders of government in Canada must be 75% or less of total project cost.
- For TransAlta's Project Pioneer, the federal contribution is \$315.8M,

As can be seen, this is a very large capital project, with large contributions from both the federal and provincial governments. Both the federal and provincial contributions need to be provided within fairly tight program timeframes, and this creates a need to front-end load the federal and provincial contributions so that the full amounts committed can be provided to the project. However, as is the case for any large capital project, the project needs to progress through various stages (design & engineering, procurement of large lead time items, construction, commissioning), which has a spending profile that is back end loaded, with the bulk of the expenditures occurring during the 18-24 month construction period, and the expenditures cannot be accelerated more than the current plan, because of this fact.

- Project Pioneer is delayed by up to 12 months due to: 1) a change in technology to a less risky and costly technology, and

s.21(1)(b)

- Project Pioneer is one of the key Carbon Capture and Storage (CCS) projects funded by NRCan, as it was selected to receive up to \$27M from the ecoENERGY Technology Initiative (ecoETI) and \$315.8 million (M) from the Clean Energy Fund (CEF). The project application is for the retrofit of a large coal-fired electricity generation facility, one of three key strategic priorities for CEF. The project has been identified as one of 7 large-scale CCS projects, in fulfillment of Canada's commitments at the G8, and is being

tracked by international organizations such as the IEA, Global CCS Institute, and Carbon Sequestration Leadership Forum.

- The City of Yellowknife's \$60M Mine-Heat and Biomass Northern District Energy System, which is expected to receive a \$14.15M contribution from the CEF is the program's flagship project in northern Canada.

s.21(1)(b)

- If this continuation request is not approved, then the consequences would likely be: 1) NRCan would not be able to provide funding to the project, resulting in the cancellation of Project Pioneer, which would be a significant setback for Canada in the area of CCS and would most likely require Ministerial and/or senior management intervention, particularly with TransAlta and the province of Alberta.; and 2) the City of Yellowknife project would have to be re-scoped to include fewer activities, with the possibility that some of the more attractive elements would have to be dropped.
- The issues and delays described above were not caused by NRCan nor were they part of the proponent's original plan. However, in NRCan's experience, these issues and delays are not out of the ordinary for new technology demonstration projects. By enabling this continuation of the ecoETI program terms & conditions, NRCan would be actively responding to a proponent's need and contributing to make this science & technology project a major success.
- This request to continue the T's & C's of the CEF program could be viewed as a risk mitigation measure to address an issue for the above two specific projects. However, assuming it is approved, the proposed solution would be available to any other CEF-funded project, should they experience a similar issue between now and March 31, 2014. All CEF recipients are and will be treated in the same way, in that this proposed solution would be available to them, if required. Also, for greater clarity, this continuation of the CEF T's & C's will not have any adverse impact on any other CEF-funded project.

Contact: Marc D'Iorio, 613-947-1222
Office of Energy Research and Development, ES



Natural Resources
Canada

Ressources naturelles
Canada

Minister Office

Cabinet de la Ministre

REFERRAL
SLIP

PAPILLON DE
PRÉSENTATION

To - À	<u>EDU</u> <u>ES</u>
Date	<u>DEC - 5 2011</u>
Subject - Sujet	<u>125255</u>

Reply under signature of the Minister
Réponse signée par la Ministre ☐

Reply under signature of
Réponse signée par ☐

Your attention and reply direct with copy to this office
Prenez connaissance, répondez directement et envoyez copie de la réponse à ce bureau ☐

Your comments
Vos observations ☐

Return enclosures(s) with reply
Remettez pièce(s) jointe(s) avec réponse ☐

For information
À titre de renseignement ☐

Carbon copy to
Copie conforme à ☐

Remarks - Remarques

See note from Minister.

Attachment 2

Costs and Benefits of Carbon Capture and Storage

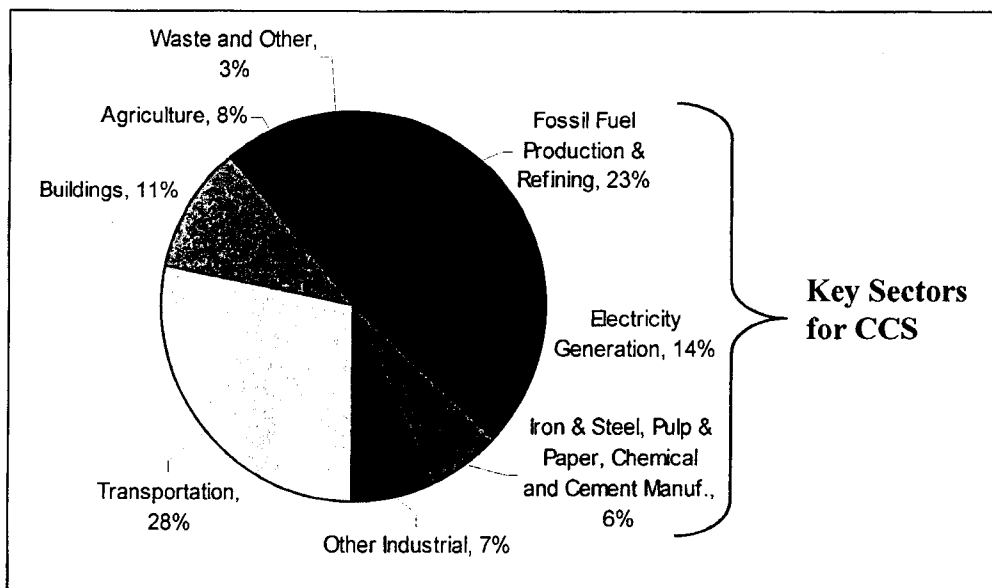
Role of CCS in Reducing Greenhouse Gas Emissions

The International Energy Agency estimates that CCS must account for 20 percent of emissions reductions by 2050 to meet international climate change targets. Without such technologies, even more difficult and costly decisions, such as curtailing production, might be necessary.

Canada is committed to reducing annual GHG emissions by 17 percent in 2020 over 2005 levels; a reduction of 124 megatonnes (Mt) of annual CO₂ equivalent emissions from 731 Mt in 2005 to a target of 607 Mt in 2020. In 2009, Canada's emissions were 690 Mt.

CCS is a leading technology for emissions reductions from large point sources in strategic sectors of the economy that account for 43 percent of Canada's total GHG emissions (Figure 1 below), including fossil fuel production and refining (23 percent), electricity generation (14 percent), and other industrial sectors, such as iron and steel, pulp and paper, chemical and cement manufacturing (6 percent).

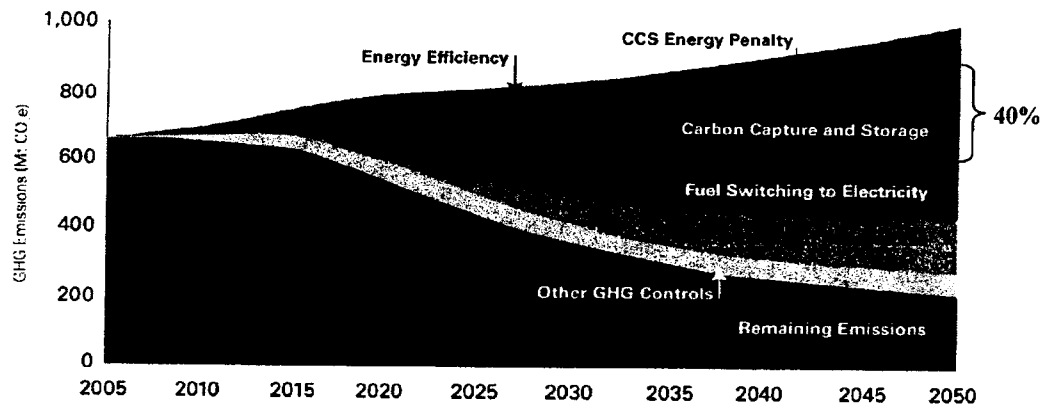
Figure 1 – Distribution (%) of Canada's 2009 Greenhouse Gas Emissions, 690 Mt



Source: Canada's National Greenhouse Gas Inventory Report, 1990-2009.

The National Round Table on the Environment and the Economy (NRTEE) estimates that up to 40 percent of Canada's emissions reductions over the longer term (least cost scenario) could come from CCS (Figure 2 below). This includes around 350 Mt of reductions from CCS by 2050. This is equivalent to deploying 140 full commercial-scale CCS projects that capture and store on average 2.5 Mt of CO₂ per year.

Figure 2 – Role of Carbon Capture and Storage in Greenhouse Gas Emissions Reduction Strategy in Canada



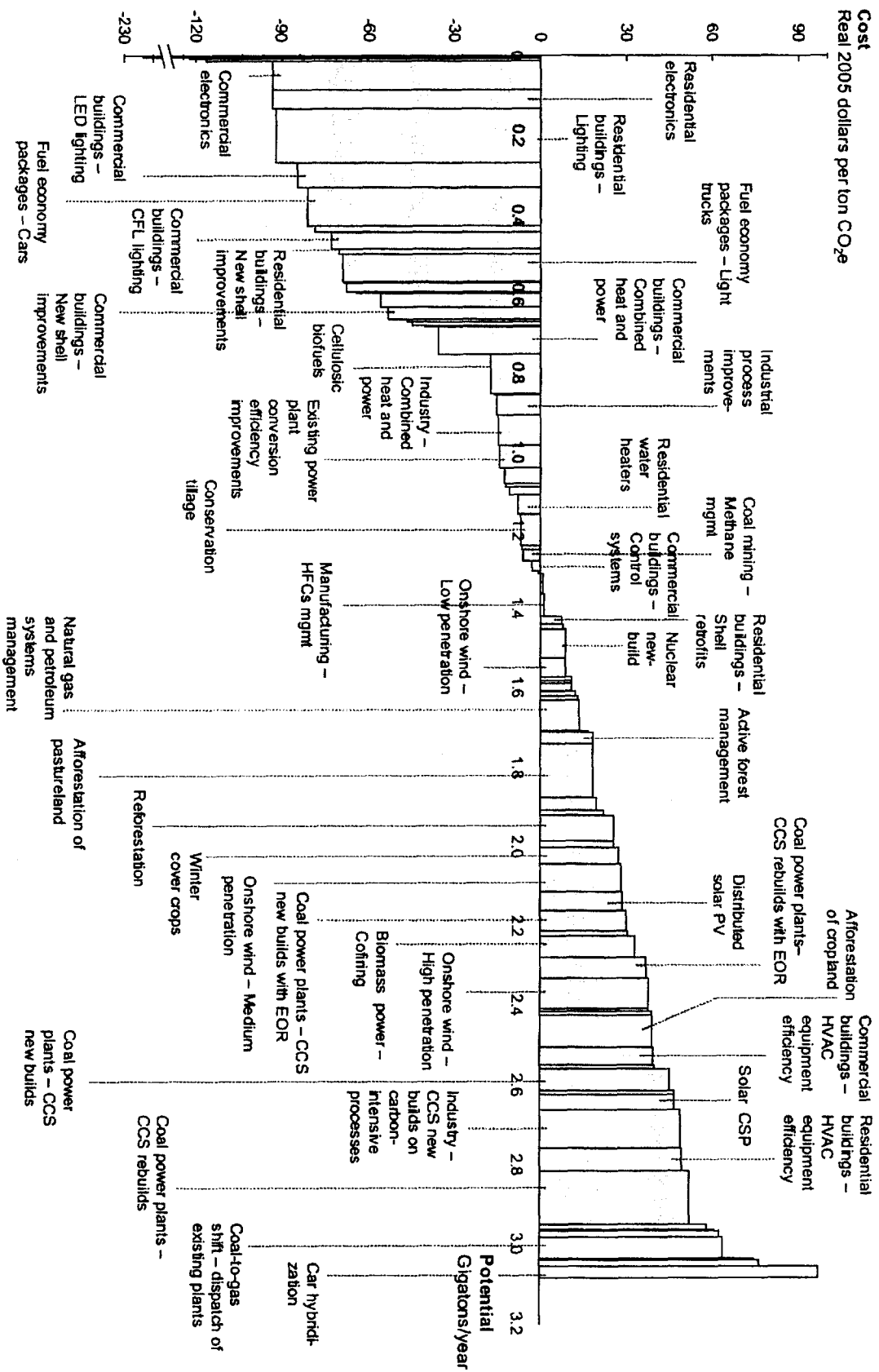
Source: The NRTEE's "Achieving 2050: A Carbon Pricing Policy for Canada," 2009.

Business Case

The McKinsey and Company's abatement cost curve for the United States (U.S.) (see Figure 3) estimates that, relative to other technologies over the longer term, CCS will be expensive (\$30-\$50 per tonne of CO₂ abated), as opposed to nuclear new builds (\$10 per tonne), onshore wind (\$10-\$40 per tonne), and distributed solar photovoltaic (\$25 per tonne).

Yet McKinsey and Company also highlights that CCS will need to play a prominent role in reducing emissions in the U.S., whose cost is comparable to other technologies that will be also be required, such as efficient heating, ventilation and air conditioning in commercial buildings (\$40 per tonne) and concentrated solar power (\$45 per tonne).

Figure 3: McKinsey and Company's CO₂ abatement cost curve for the United States



Source: McKinsey analysis

However, the economics of CCS have not yet been demonstrated on a large-scale. There are less than 10 large-scale projects in operation around the world, and none so far that integrates CCS in key sectors such as electricity generation. As a result, there is still a lot of risk and uncertainty about the actual costs.

Thus, first-mover CCS projects, since the technology is not mature, could realize much higher costs than in the McKinsey and Company's study. This is proving to be the case in Canada (e.g. more in the order of \$100 per tonne for coal-fired electricity). Other applications in Canada, such as integrating CCS with *in situ* facilities in the oil sands, are also expected to have much higher costs.

The business case for industry to invest in CCS is currently unfavourable. Revenue potential from selling captured CO₂ for EOR is estimated between \$20 and \$40 per tonne, if EOR is an option. Alberta's GHG regulations also offer credits for emissions abatement, but the value is currently capped at \$15 per tonne.

Thus, compared to the costs, there is still a significant economic gap currently facing large-scale CCS demonstration projects in Canada, which requires being addressed through government funding programs such as the federal CEF.

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MEMORANDUM TO THE DEPUTY MINISTER

CARBONATES IN CANADA'S OIL SANDS REGION

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(For Information by January 16, 2012)

SUMMARY

- The purpose of this note is to provide you with an overview of carbonate formations situated in Canada's oil sands region as well as efforts currently underway to assess the feasibility of recovering bitumen resources contained within these formations.
- Alberta's Energy Resources Conservation Board (ERCB) estimates that Alberta's carbonates, limestone rocks that contain crude, hold approximately 536 billion (B) barrels of oil and account for approximately 30 percent of Alberta's total bitumen resources.
- Commercial efforts to recover bitumen from carbonates have met limited success in past decades and fully commercialized production was thought to be decades away. However, while the economic viability of bitumen carbonates has yet to be proven, a number of pilot projects currently in progress may result in the development of sustainable recovery technologies earlier than anticipated.
- Should the development of economically-viable extraction methods advance further, early industry estimates suggest that 19 percent of Alberta's carbonate resource may be recoverable. As a result, bitumen carbonate recovery could increase Canada's total recoverable reserves by 107.2B barrels and, in doing so, significantly increase the overall growth and production potential of the oil sands in the medium-to-long term.

BACKGROUND

Carbonates are sedimentary rocks, primarily composed of calcium carbonate (limestone) or calcium magnesium carbonate (dolomite), which form many petroleum reservoirs.

A cluster of geological formations in north eastern Alberta hold 96 percent of the world's carbonate resource (see Attachment 1). In carbonates, bitumen is suspended in both dense limestone as well as heavily karsted (tunnelled, fissured or cavernous) rock. Unlike conventional sources of oil, the recovery of bitumen from carbonates requires "stimulation" achieved through the use of *in-situ* production methods which create pathways through which bitumen can move to the wellbore. The varied nature of carbonate reservoirs complicates the recovery of bitumen by requiring the use of multiple recovery methods and drilling in highly cavernous and tunnelled areas.

Several production pilots were conducted on Alberta's carbonate reservoirs in the 1970s and 1980s using cyclic steam stimulation (CSS), an *in-situ* production method which involves injecting high-pressure steam into the bitumen reservoir. Although early steam-assisted bitumen recovery technologies saw limited success, more recent technological improvements better accommodate the features of carbonate reservoirs and could increase the likelihood of successful recovery of bitumen from carbonates. These developments include:

- Horizontal well-drilling capabilities;
- Improved well-completion technologies; and,
- New *in-situ* production methods.

Industry Trial Projects

A number of oil sands investors are currently undertaking assessments and pilot projects to consider the ability of *in-situ* technologies to optimize the recovery of oil resources from Alberta's carbonates. Laricina Energy, Athabasca Oil Sands Corporation, Husky Energy, Strata Oil & Gas, and Royal Dutch Shell are moving forward with appraisal and exploration activities as well as the construction and operation of pilot projects testing the recovery of bitumen contained in their leases on Alberta's carbonate formations. According to industry estimates, pilot activities are underway in leases that contain approximately 15.7B barrels of contingent and prospective recoverable bitumen carbonate reserves.

Laricina Energy, a privately-held Calgary-based company, is considered by industry experts to be a leader in the development of carbonate recovery technology. Laricina is currently running a pilot project to test the use of steam-assisted gravity drainage (SAGD) to extract bitumen from its Saleski leases on Alberta's Grosmont carbonate formation.

The pilot using SAGD technology began steam injection in December 2010 and this process will be followed by the use of solvent-cyclic SAGD (SC-SAGD). This method s.20(1)(b) will inject both steam and solvents into the bitumen reservoir to facilitate oil s.21(1)(b) placement and extraction.



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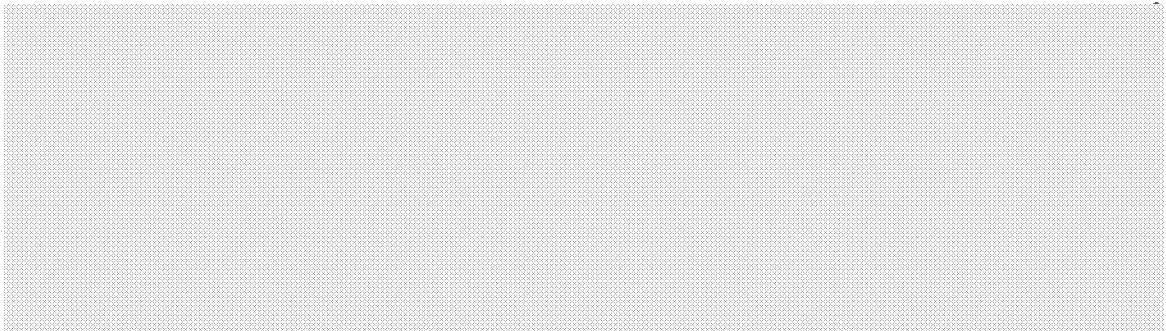
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s.21(1)(b)



The use of solvents reduces the natural gas burned per barrel of oil produced and increases bitumen recovery, lowering SORs and implying improved per-barrel rates of greenhouse gas emissions. However, industry experts have suggested that, given the early pilot stages of solvent-aided processes, the overall environmental impacts of this method are still being assessed for larger scale commercial operations.

CONCLUSION

There is a significant amount of bitumen contained within Alberta's carbonates and new technologies have led to pilot projects testing the extraction of bitumen from these formations. Early results of these pilots are promising and could lead to production in the 2014/2015 horizon.

Leases on which pilot projects are currently underway are estimated to contain 15.7B barrels of contingent and prospective recoverable bitumen carbonate reserves. Should these pilots lead to widespread commercial operations, Canada's proven reserves could increase to roughly 281B barrels, surpassing those of Saudi Arabia and Venezuela.

Natural Resources Canada officials will continue to monitor the progress of current carbonate pilot projects in order to ensure any potential implications of accessing Alberta's carbonate resources are tracked.

Mark Corey

Attachment: (1)

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Petroleum Resources Branch/ES

Alberta's Bitumen Carbonate Triangle

