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# Better Together? Linking Climate Policy with the U.S.

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Dave Sawyer

[dave@enviroeconomics.ca](mailto:dave@enviroeconomics.ca)

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# Canada's Climate Policy “Intentions”

- **Canada Targets.** Reduction targets of -20% below 2006 levels by 2020 and -60 to -70% in 2050
  - New targets announced Saturday, of -17% below 2005. But emissions higher in 2005, so more like a 6% easing.
- Canada's *Regulatory Framework on Air Emissions (2007): “Turning the Corner”* (TTC).
- **Coverage** about 50% of national inventory. Large energy users and producers
- **Intensity based standards** phased in 2012 with an 18% improvement in 2006 intensity by 2012 and then a 2% annual thereafter.
- **No hard cap** placed on emissions, with intensity standard allowing overall emissions to grow.
- **Compliance options.** abatement, permit purchases and sales between regulated entities, domestic offsets, international CDM credits up to 10% of compliance, and access to a technology fund (safety valve) that phased out by 2020.
  
- But as of 2009, the Plan was shelved, with no clear policy guidance.
- Instead broad references to US linking

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## Which gets us thinking about linking...

“we need a substantial effort from the United States; and a comparable effort from Canada, so we can create an effective North American climate change regime with national policies that are harmonized, consistent and free from conflict. A continental system composed of national policies and regulations that are equal in value and of similar effect, so we foster fair competition and maintain free trade in the integrated North American market”.

Minister Prentice, November 2009

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# Understanding the Policy Drivers

- Accommodate growing industrial emissions, and the growth in oil sands more specifically.
  - The desire of the Government of Canada to allow oil sands development and industrial activity to grow somewhat unfettered is central to future policy directions.
- Closely aligned is the desire to use some form of a technology fund “safety value” that incents CCS in the oil sector.
- Perceived competitiveness impacts with the US has underscored the debate, and indeed the lack of US action has been and continues to be an oft cited reason for Canada to delay.
- The perceived threat of US border measures and California's Low Carbon Fuel Standard has only served to underscore this neurosis.

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## Conjecture on Future Policy

- An eye on harmonization and eventual permit trade with the US will likely set both future targets as well as elements of policy.
- A new policy based on TTC likely, with a hard cap on compliance.
- A technology fund will likely figure prominently, with output-based allocations to help energy-intensive and trade-exposed sectors.
- Coverage remains a glaring divergence with US policy. No signal of intent to address the remaining emissions in transportation and buildings, or about 36% of the national inventory.
- Intent in the US to auction permits, and so appropriate the value embodied in the remaining emissions, is in contrast to Canada where permit auctioning is not mentioned in policy circles.
  - Aversion to raising average costs.

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## Thinking about Linking... TCC and ACES09

1. **Alone or Linked Together?** Current Canadian and US policies are implemented alone and then linked.
  - What do we gain from permit trade?
2. **Why Follow the Leader?** Canada seeks to demonstrate comparable stringency and avoid border carbon adjustments.
  - But comparable stringency on what basis?

Models, caveats, scenarios and discussion

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## Modeling Framework – A focus on 2020

### **Cross-border trade and abatement responses model**

- **Canada.** CIMS integrated energy and emissions model used for economic and emissions forecasts, plus abatement responses
- **US.** EIA HR 2454 runs to develop abatement cost curves and forecast emissions

### **Canadian macroeconomic impacts**

- GEEM tracks impacts on GDP, gross output and trade, etc.

### **US macroeconomic impacts are not modeled**

- Income effects and demand no. Relative permit prices yes

**Preliminary, highly uncertain, but hopefully directional**

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## A bit more on models....

- **CIMS** simulates technological evolution of fixed capital stocks and changes in costs, energy use, emissions of various carbon polices
- **GEEM** is a general equilibrium model of the Canadian economy where price shocks drive changes in demand, supply, and cross-border trade

Together, these two models combine,

- The technology richness required to understand emissions and cost implications of carbon policy (CIMS).
- With the macroeconomic and trade capabilities of general equilibrium models (GEEM).



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## Scenario: Alone or linking together?

- **What do we gain from permit trade?**

Canada alone under Turning the Corner

- (-20%/06). Coverage of industrials, with unlimited domestic offsets and 10% international, not intensity but capped

US alone under ACES, 09.

- (-17%/05). Economy-wide coverage, unlimited domestic offsets and 28% international

**Then linked together through cross-border trade**

# Alone or Together: Compliance



- Policies differ on coverage and international offset limits, offsets drive differences
- Despite broader US coverage, the higher limit on international offsets keeps low internal US abatement
- Cross-border trade reduces abatement from Canadian industrials significantly, electricity in particular
- Oil and gas permit purchases from Canadian electricity then flow to US electricity

## Alone or Together: Costs

		Permit Price	Total Cost (\$B CDN)	Share of 2008 GDP
Alone	Can TTC-RF	\$62	\$2.4	0.18%
	US ACESA	\$30	\$18.50	0.13%
Together	Can TTC-RF	\$31	\$1.7	0.13%
	US ACESA		\$19.1	0.13%

### Alone

- Permit prices are ~50% more in Canada under policies
- Relatively, Canadian costs are higher, even though coverage is less
- Differences due to international offset limits, but emissions growth in Canada contributes

### Together

- Linked together halves Canadian permit price lowering costs 30%
- US costs rise due to Canadian demand for US permits, but not much
- Cross-border permit imports to Canada are \$720 million (in 2020)

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## Alone or Together: Macro

<b>Canada</b>	GDP	Trade Surplus or Net Exports	Gross Output	Oil and Gas Royalties
LFE Alone	-0.46%	-0.18%	-0.62%	-9.20%
LFE Linked Together	-0.20%	-0.03%	-0.25%	-4.70%

- Linking lowers permit prices, reducing both macroeconomic impacts and trade effects
- Impacts can be more or less halved, but trade exposed gain more
- Aligning carbon prices significantly reduces competitiveness impacts through smoothing relative prices
- While permit flows are to the US, with capital leaving Canada, the avoided carbon costs more than outweigh the loss in capital

# Alone or Together: Sector GDP

Canada	Alone or Linked together?	
	LFE Alone	LFE Linked
Oil and Gas	-7.50%	-3.90%
Mining	-3.40%	-0.90%
Petroleum Refining	-1.90%	-1.10%
Other Manufacturing	-1.20%	-0.30%
Industrial Minerals	-1.00%	-0.30%
Rest of Economy	-0.50%	-0.20%
Pulp and Paper	5.90%	3.00%
Electricity	10.30%	5.60%

## Together

- Trade together helps permit buyers significantly
- But sellers suffer, with US permit imports
- Offset providers are also impacted, given lower domestic prices.
- US opportunities perhaps, but large US supply limits market
- US international offsets also compete

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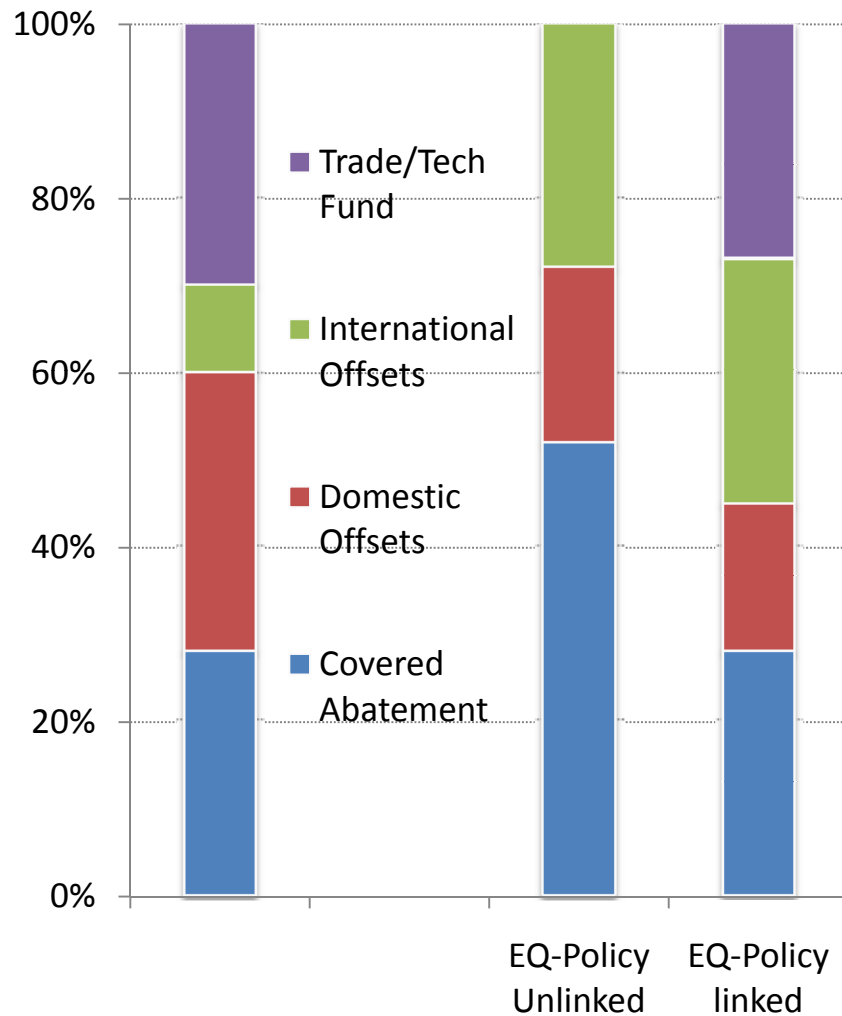
## Scenario: Follow the Leader?

Comparable stringency to avoid border carbon adjustments

But comparable on price, emissions, coverage or what?

- **Comparable stringency on price, TTC-RF Coverage.** TTC with US allowance price, remaining compliance gap with tech fund
  - *TTC emission intensity likely meets stringency test*
- **Comparable stringency on policy. ACES in Canada.** Same coverage, compliance targets and flexibility mechanisms
  1. **Equal policy but Canada alone.** Expanded coverage and no linked permit trade. International offsets from 10% to equal ACES 29%
  2. **Equal but linked policy.** Adds linked trade in permits

# Follow the Leader: Compliance



## Price equivalency, under TTC-RF

With lower US price,

- Low abatement industrials
- Domestic offsets insensitive
- Tech. fund heavily subscribed

## With ACESA Policy in Canada

Expanded coverage, no link:

- domestic abatement high
- Domestic offsets suffer due to international and trade

With trade,

- less covered sector abatement

## Cost containment is key

- EQ-Price and EQ-Policy similar, tech fund vs. trade and international

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## Follow the Leader: Cost

Canada Equivalency	Permit Price	Total Cost (\$M CDN)	Share of 2008 GDP
Alone On Price LFE coverage	\$30	\$1,628	0.12%
Alone on US Policy, economy	\$75	\$5,325	0.41%
Linked with US Policy, economy	\$32	\$4,712	0.36%

- **E-Price.** Total costs fall by about 30% below TTC alone
- **Alone on Policy.** With ACES in Canada, not linked, high permit price despite generous international offsets limit.
  - Higher total costs given the expanded coverage
  - US alone was 0.13% of GDP
- **Linked on Policy.** The permit price is halved, which then lowers total costs by 35% compared to the no trade case



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## Follow the Leader: Macro

	GDP	Trade Surplus or Net Exports	Gross Output	Oil and Gas Royalties
Equal on Price	-0.20%	-0.02%	-0.25%	-4.7%
Equal on Policy Unlinked	-1.42%	-0.74%	-1.67%	-14.7%
Equal on Policy Linked	-0.71%	-0.30%	-0.79%	-7.8%

- **Price.** The technology fund, and the associated domestic spending, instead of cross-border permit trade does ameliorate impacts (relative to TTC-Alone of -0.3%).
- Plus tech deployment and innovation benefits. Especially important given low carbon price relative to CCS costs
- **Policy.** Coverage leads to high impact
- **It is cost containment and not necessarily linked permit trade that is the bigger determinant of impact.**

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## Is linked permit trade the best policy?

- If we are going deeper, transformative technologies need innovation
  - But linking lowers costs significantly in Canada, and hence lower learning by doing and returns to innovation
  - Importing permits can smooth relative prices, but they take away the incentive to innovate
  - Emission reductions not guaranteed with US permit imports given indirect link to international offsets *vis* US.
  - Comparable stringency does not require linking
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- Will the US want to link?