

再生可能エネルギー経済学講座
2019年度【部門C】第1回研究会

北米のカーボンプライシングに関する 研究成果と今後の課題 ～カナダの事例を中心に～

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Background

- The Paris Agreement is a major step, but it needs to be further strengthened policies in order to achieve the 2° C target
- Domestic carbon pricing is a promising way of substantiating the Paris Agreement
- Its application does not only extend to several continents and countries but also to different governance levels (World Bank and Ecofys 2016)
- Especially in countries where national level taxes or cap-and-trade schemes have failed

Canada

- BC: carbon tax in 2009
- Québec and Ontario: C&T under the umbrella of WCI in 2013 and 2017, respectively
- In October 2016, Trudeau tried to utilize sub-national dynamics in order to establish a national carbon pricing corridor

Outline

1. Multi-level Governed Carbon Pricing: An Introduction

2. KAKENHI proposal (FY2016-19) results

“Green Tax and Fiscal Reform of Regional Carbon Pricing: Focus on Subnational Carbon Taxes in North America”

3. New KAKENHI proposal (FY2019-21)

“Research on the Design of Vertical Coordinated Carbon Pricing in Canada”

Theory of Sub-national Carbon Pricing (CP)

- “Environmental Federalism” in North America (Oates 2004)

“Decentralization”

*Revesz 1992; Adler 2001;
Oates 2004

- (1) “policy laboratories”
- (2) better tailor policies to local preferences and specifics

“Centralization”

*Stewart (1977)

- (1) transboundary-typed externalities
- (2) “race to the bottom”



Well-designed sub-national carbon pricing promises to be a valuable supplement to global climate action

KAKENHI proposal (FY2016-19)

“Green Tax and Fiscal Reform of Regional Carbon Pricing: Focus on Subnational Carbon Taxes in North America”

Research Questions

- Is sub-national level GHG pricing politically more promising than national level schemes?
- Does sub-national action stimulate other jurisdictions or national government to follow suit?

*Empirical results show no evidence on “*race to the bottom*” (List & Gerking 2000; Fredriksson & Millimet 2002), No ex-ante studies

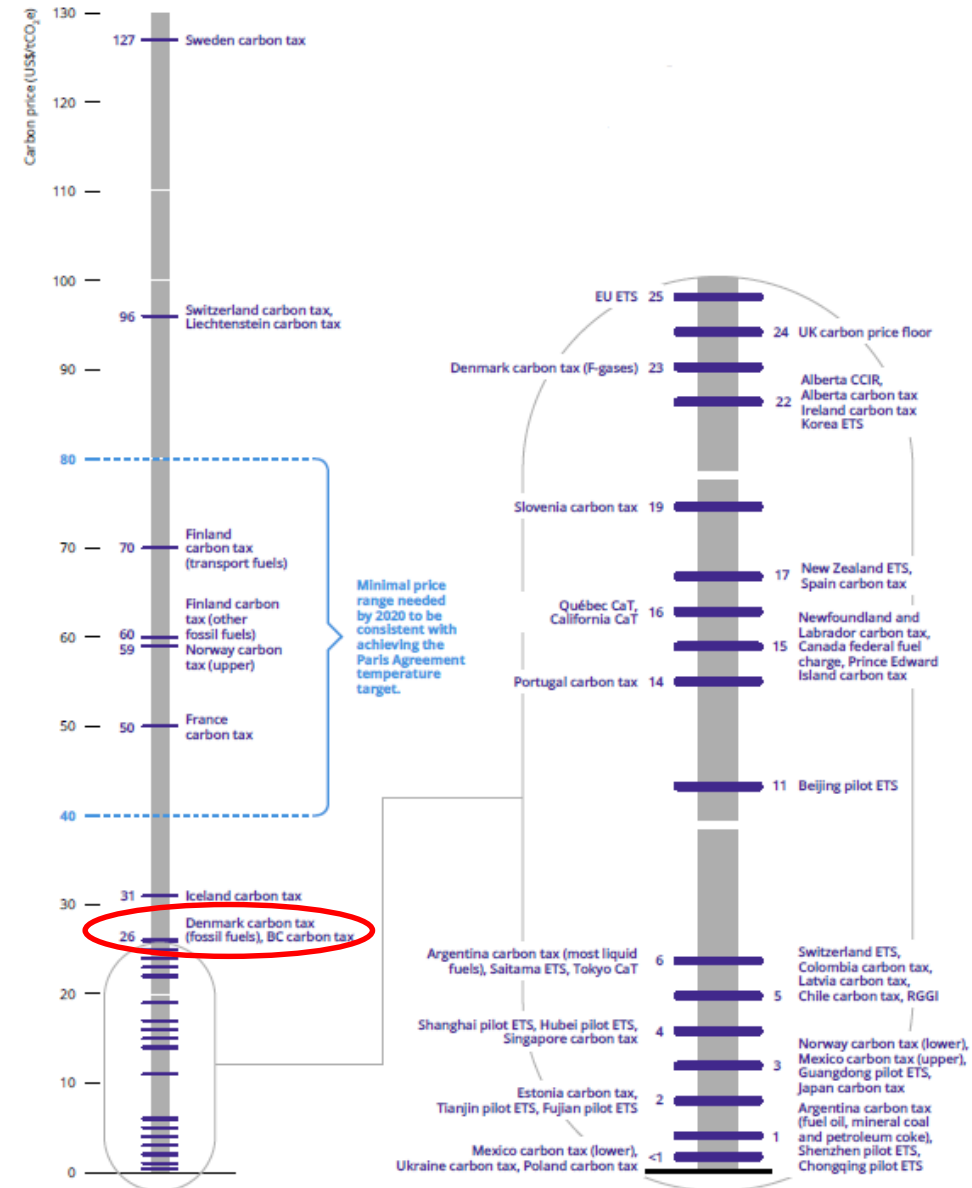
- How can the current developments in Canada be evaluated?

Objective

- To answer these questions and then find whether Canada can become the new North American carbon pricing champions

Evaluation of BC carbon tax

- **Aggressive GHG reductions targets:** 30% from 2007 by 2020; 80% by 2050
- **Relatively broad tax base:** 70% of all GHG emissions **combusted** in the province.
- **Slow rise:** \$5/t/year to **\$40/tCO_e** on April 1, 2019 (\$50/tCO_e on April 1, 2021)
- **Minimal administration costs:** by relying on established procedures of fuel tax collection



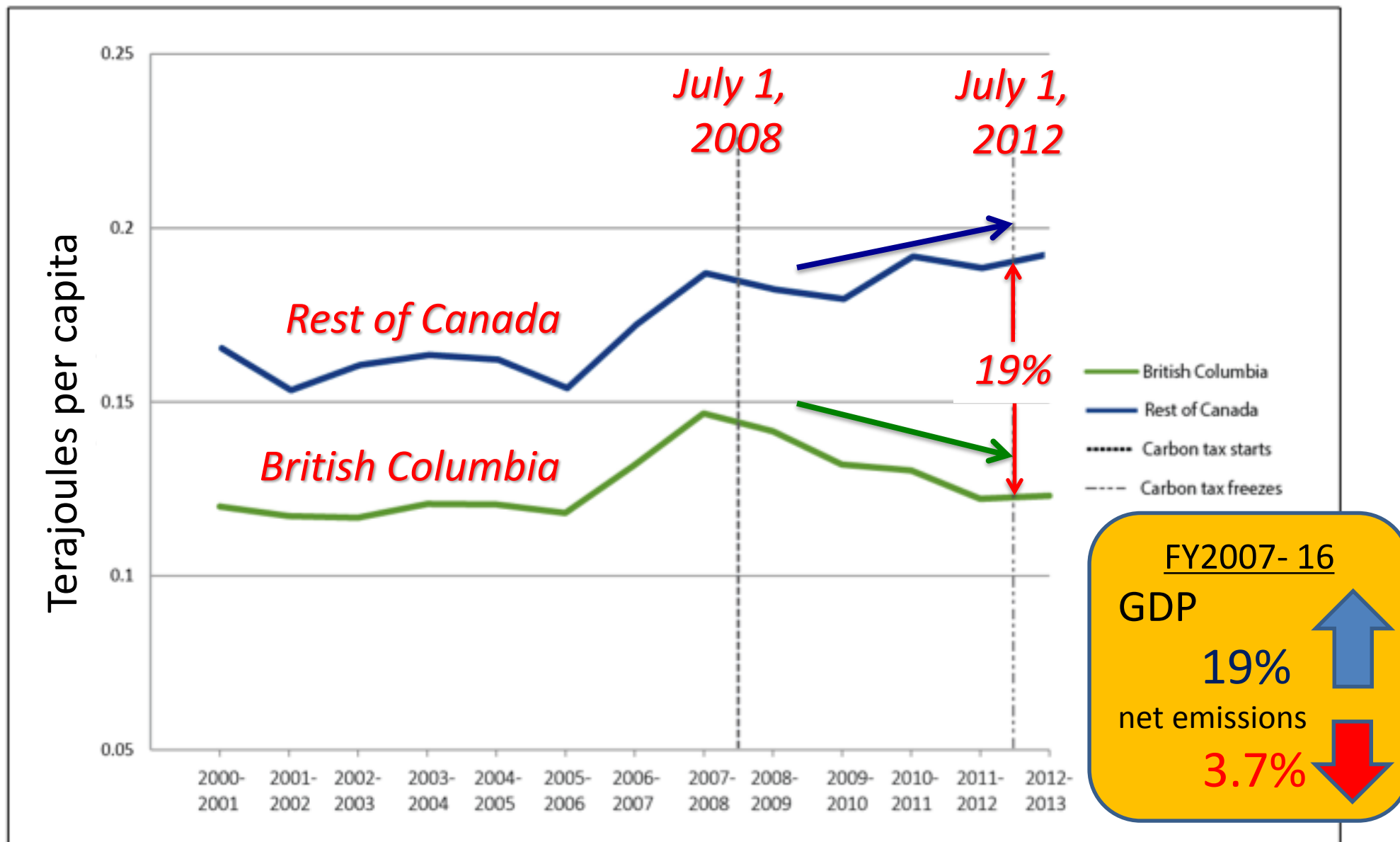
Evaluation of BC carbon tax, continued

- **Revenue neutrality:** mandated and ensures full, transparent, ongoing revenue recycling to household (lowest PIT in Canada) and businesses (lowest CIT in OECD and G7 countries)
- **Socioeconomically fair:** protected low-income households especially in rural or northern areas through revenue-recycling via the other tax cut and special tax credits



- BC carbon tax fulfills to a considerable extent ambitious sustainability criteria (Rudolph, Kawakatsu and Lerch 2014)
- BC ETR has reduced per capita GHG emissions by 10% without any detrimental effect on the economy or the income distribution (Murray and Rivers 2015)

All fossil fuel consumption per capita, 2000-2013

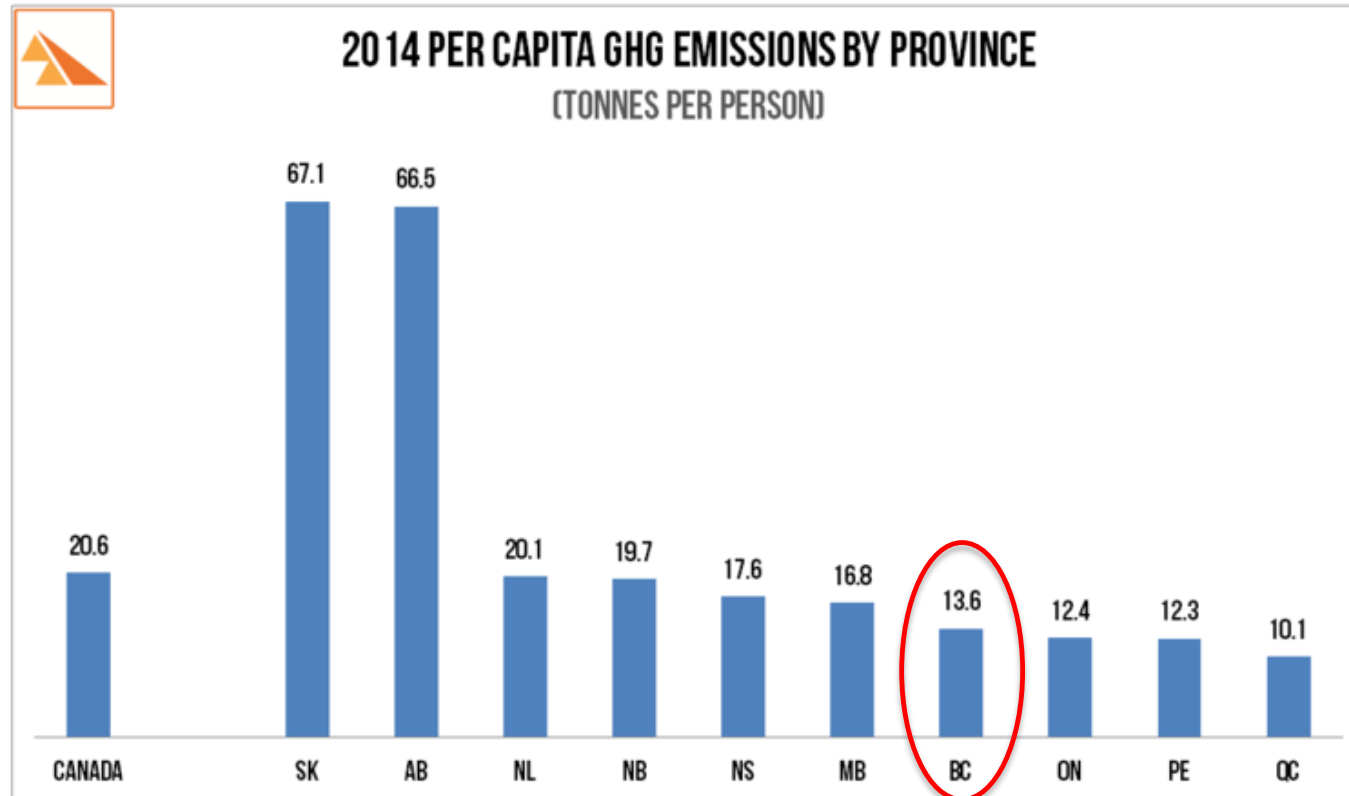


Why sustainable design succeeded in BC?

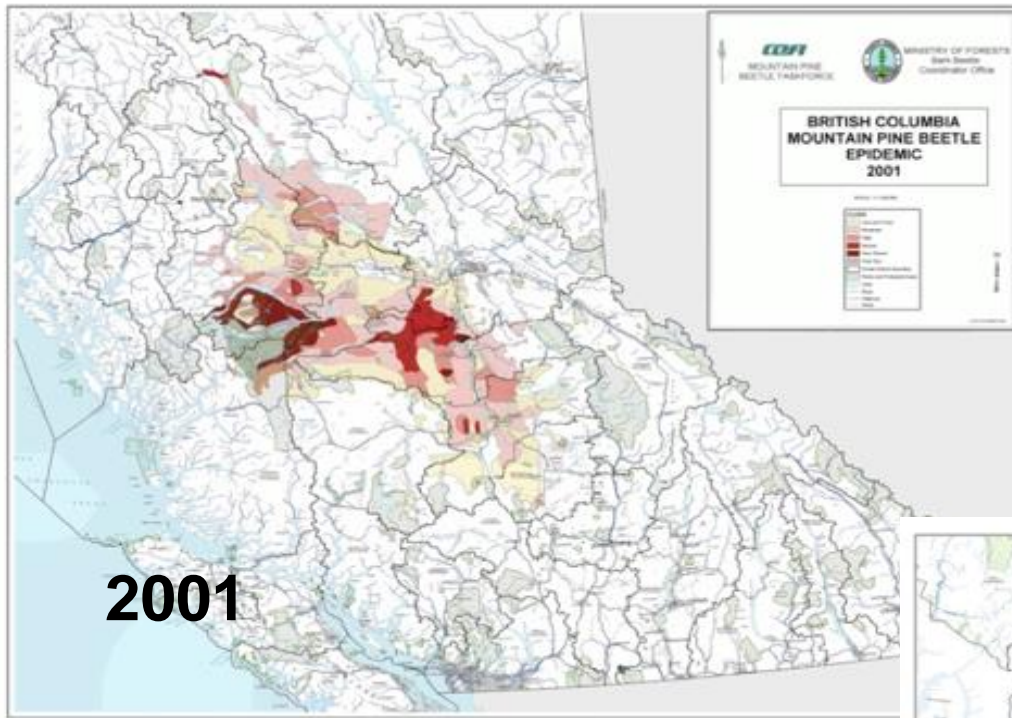
External factors

1. BC's energy and GHG emission structure

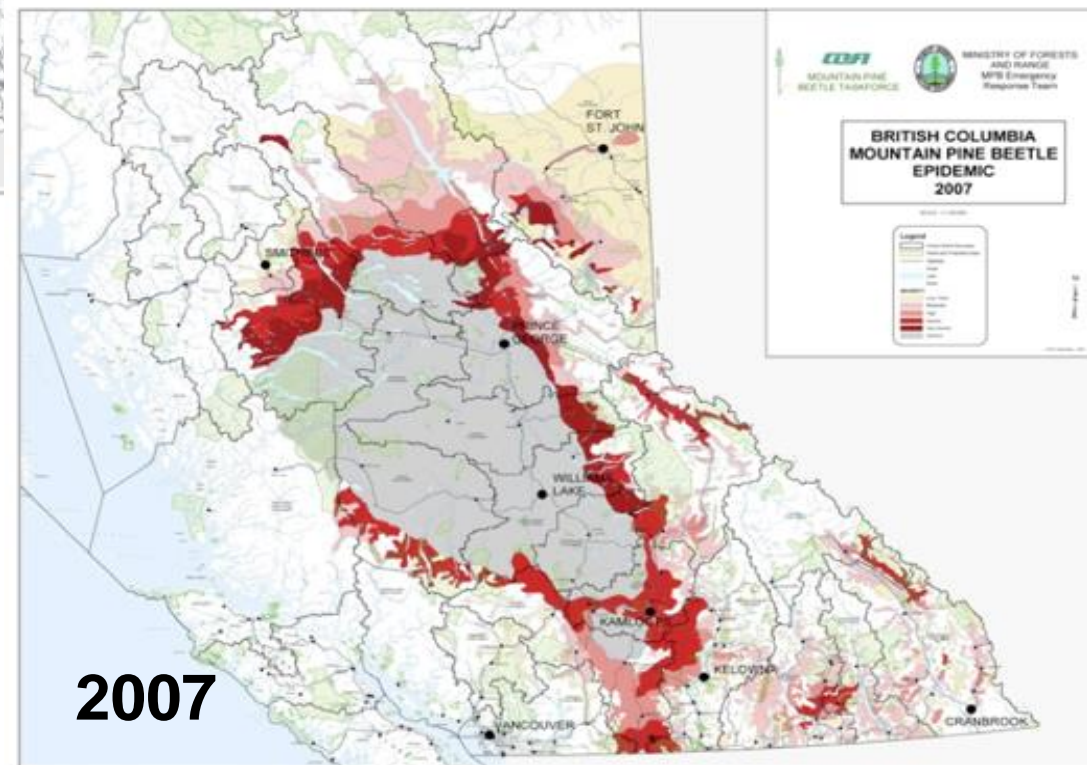
- Hydro Power, which provides 93% of BC's electricity
- Coal industry, which accounts for 80% of Canada's coal production, exports almost all of its coal to other jurisdictions



Source: Environment Canada, National Inventory Report to IPCC 1990-2014: GHG Sources and Sinks by Provinces and Territories; StatsCan - Population Data by Province and Territory



2. Destroyed 50% of the stock of commercially valuable BC pine by the beetle infestation (Pedersen and Elgie 2015)



3. The specific political system in BC favored a strong Premier, which enable political leader to dominate the political agenda (Harrison 2013a)

Actors' behavior in the process

- **LP** was re-elected in 2009 and captured environmental vote when **NDP** campaigned with “Axe the tax” (Harrison 2013a)
- **Premier Gordon Campbell** was strongly committed to act against climate change (Jaccard 2012)
- **Environmental organizations** called for even more ambitious targets and the use of market-based approaches (Interview, PICS, Nov 1, 2016)
- **Industry** had sent clear signals that (1) the tax be applied evenly to each sector, and (2) be revenue neutral (Harrison 2013a)
- **Climate Action Secretariat (CAS)** mainly saw the environmental merits, while **MoF** also hoped for having a say in climate policy due to the need for a revenue spending strategy (Interview, MoF & CAS, Oct 31, 2016)



- The confluence of reinforcing external factors and influential political stakeholder behavior not being as opposed as expected

Limit of Subnational Carbon Pricing

Until 2013, despite of the BC success, neither did any other province follow suit nor did the federal government engage in CP

Why? (Harrison 2013b)

- Due to the differences in the economic and emissions structure between sub-national jurisdictions, simply following the good examples of the leaders appears unwise
- Sub-national jurisdictions try to claim credit for emission reductions in other jurisdictions
- A lack of either inter-jurisdictional collaboration or lobbying for federal intervention, at least in the long-run, hinders sub-national activities

However, current development in Canada appear promising!

Evaluation of Québec and Ontario C & T

2013 saw the beginning of new dynamics in sub-national CP in Canada!
although the design against ambitious sustainability criteria provides an ambivalent picture

Positive side

Coverage is comprehensive and major emitters and importers as well as fuel distributors fully pay for their emission rights

Revenues are almost entirely used for climate protection

Banking is allowed, borrowing prohibited, and offsets are accepted, but limited in quantity with sustainability criteria applying

Price collars with lower and upper price limits apply

Compliance is verified in three-year control periods via a reliable monitoring schemes, while penalties combine fines with over-compensation of excess emissions

Negative side

the cap, especially in Ontario, lacks ambition

the biggest part of industry is exempted from auctioning

revenue use does not compensate disadvantaged households for the regressive effects

while a price collar is applied, both the price floor and the price ceiling are too low

Beyond the Limit of Subnational Carbon Pricing

- Ontario, the second biggest emitter of total GHG emissions amongst Canadian provinces, joined the WCI efforts to establish ambitious CP
- BC, Quebec, Ontario and Alberta, representing over 80% of the population, have successfully implemented CP
- Inter-jurisdictional collaboration appears to gain momentum with intentions of additional provinces and US states to re-join and link planned domestic carbon markets with WCI partners (Rudolph, Kawakatsu and Lerch 2017)
- Political good will be showing on the sub-national level in North America despite the Trump-administration's withdrawal from ambitious climate policy



Oct 3, 2016 Trudeau's CP initiative (Pan-Canadian Approach to PC Pollution) provides the necessary federal-level incentive to engage in ambitious carbon pricing at the provincial level

Main benchmark

- All provinces will have CP by 2018
- Pricing will be based on GHG emissions and applied to a common and broad set of sources, at a minimum, **the same as BC's**
- Provinces can choose taxes or a C&T to implement this price
- At a minimum of 10 CA\$/t to **50 CA\$/t in 2022**
- Guaranteeing revenue neutrality for federal; **all proceeds from taxes or auctioning would stay in the respective provinces**
- Each jurisdiction can use CP revenues according to their needs
- **Federal backstop**



Pricing target is challenging. While federally mandating a certain minimum price level, giving provinces the freedom to choose the instrument allows them to act as policy laboratories

Summary

- Subnational action can stimulate not only neighboring jurisdictions to follow suit. But there is a limit
- Tailor-made sub-national action can be a valuable supplement to national action especially in countries with reluctant federal governments leading to a “race-to-the-top” than to the bottom
- Canada has the historic chance of becoming a not only a North American but also a global leader in market-based climate policy development from the bottom up

New KAKENHI proposal (FY2019-21)

“Research on the Design of Vertical Coordinated Carbon Pricing in Canada”





Research Questions

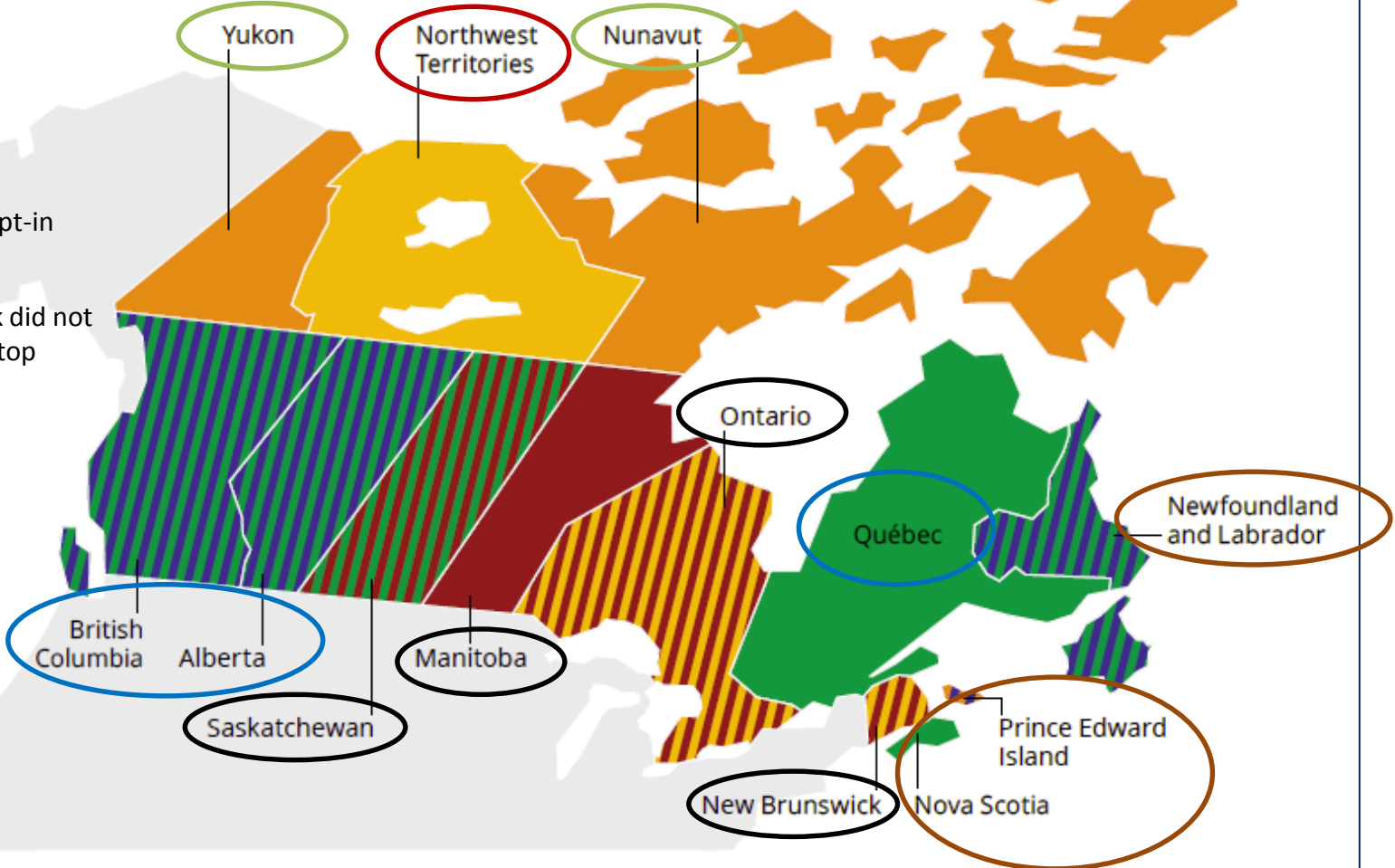
- How will the federal initiative have influence on the design of each subnational government with and without carbon pricing, especially in carbon-intensive provinces?
- And then, what kind of the design coordination will be required between federal and provincial government (or WCI)?
- Which do the provinces without carbon pricing choose their own carbon tax/emission trading or federal backstop? And why?
- How does/will each province use the revenue from carbon pricing? And why?

Objective

- To learn from lessons in Canadian cases and then obtain some suggestions for carbon pricing design and strategy in Japan

Summary map of key carbon pricing developments in Canadian provinces and territories

-  Existing CP, Federal benchmark met
-  Own CP, Federal benchmark met
-  Federal backstop opt-in
-  Federal benchmark did not met, Federal backstop

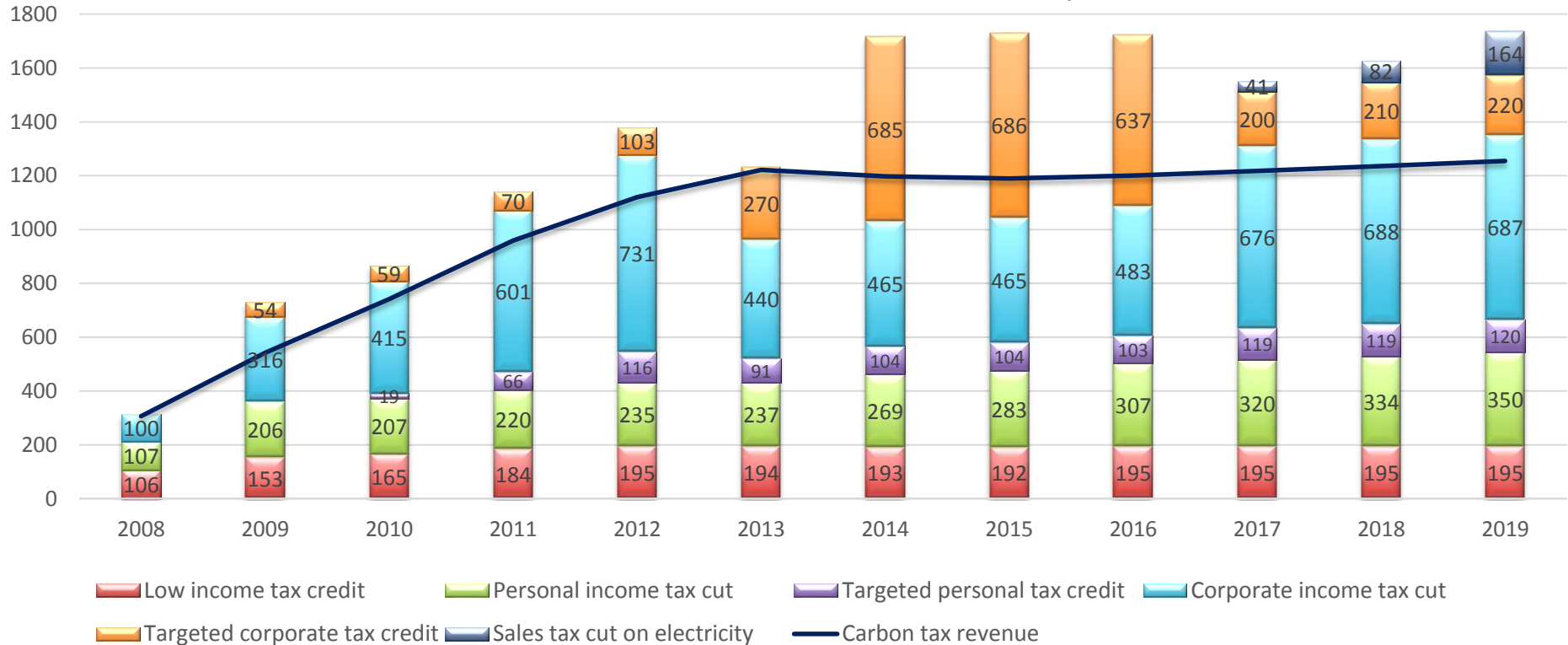


-  ETS implemented
-  ETS and carbon tax implemented
-  Carbon tax under consideration
-  Federal backstop system opt-in
-  Federal backstop system fully imposed
-  ETS implemented, federal backstop system partially imposed
-  ETS under consideration, federal backstop system fully imposed
-  Carbon tax implemented, federal OBPS opt-in

Source: World Bank Group 2019

Recent developments in BC carbon tax

Distribution of uses of BC carbon tax revenues, 2008-2019



Source: BC Budget and Fiscal Plan (2008-2017)

New revenues generated from BC carbon tax increases:

- Carbon tax relief for low- and moderate-income people
- Support for emissions intense industry to transition to a low-carbon economy
- New green initiatives to grow innovation and investment

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