



GNARLY TREE
SUSTAINABILITY
INSTITUTE

Carbon Pricing and Transitioning to a Low Carbon Economy

Kenneth Richards, PhD, JD

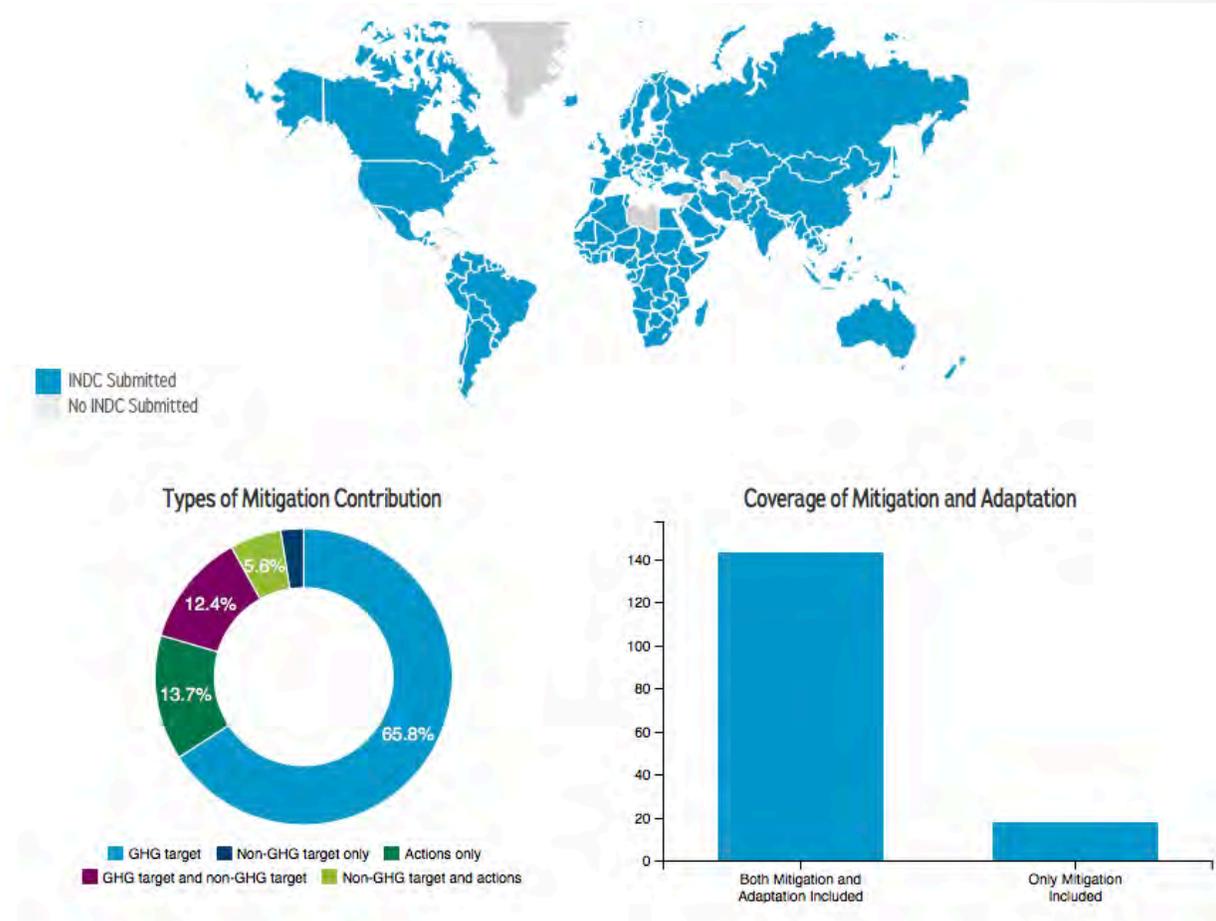
Stephanie Hayes Richards, MBA, MPA

Gnarly Tree Sustainability Institute

29 April 2016

Paris COP21 Meetings

- 161 Intended Nationally Determined Contributions (INDCs)
- INDCs cover 98.7% of all global emissions
- If implemented, will lead to a 9 % reduction in 2030 per capita emissions relative to 1990
- But global emissions will still be 37-52 percent higher in 2030 than in 1990
- Many of the INDCs are conditional



Source: <http://cait.wri.org/indc/>



Singapore among 175 nations which signed landmark Paris Agreement climate accord



Minister for Foreign Affairs Vivian Balakrishnan signing the Paris Agreement on climate change at the United Nations Headquarters in New York. PHOTO: AFP

🕒 PUBLISHED APR 23, 2016, 9:11 AM SGT

Melissa Sim US Correspondent in Washington

The Paris Agreement to curb global climate change is a "strong affirmation that diplomacy is essential and capable of solving problems on the global commons", said Minister for Foreign Affairs Vivian Balakrishnan at the United Nations headquarters in New York, where 175 nations signed the landmark climate accord on Friday.

While this was the biggest one-day endorsement of a global agreement, many states still require a parliamentary vote to formally approve the deal.



POLITICS

Carbon Pricing Becomes a Cause for the World Bank and I.M.F.

By CORAL DAVENPORT APRIL 23, 2016



The United Nations gathered Friday to sign an agreement to combat climate change. Many officials from the signing countries addressed the General Assembly, including Secretary of State John Kerry. By UNTV, VIA REUTERS on April 22, 2016. Photo by Timothy A. Clary/Agence France-Presse — Getty Images. [Watch in Times Video »](#)



The [World Bank](#) and [International Monetary Fund](#) are pressing governments to impose a price tag on planet-warming carbon dioxide emissions, using economic leverage and technical assistance that institutions like the United Nations cannot muster.



GNARLY TREE
SUSTAINABILITY
INSTITUTE

World Bank Initiative

- World Bank hosts the Partnership for Market Readiness to provide technical support and finance to countries
- 2016 released "Emissions Trading in Practice: A Handbook on Design and Implementation"
- In 2016 commissioned "The Carbon Tax Guidebook"
- Consortium of Climate Focus, Indiana University School of Public and Environmental Affairs, and Gnarly Tree Sustainability Institute
- Publication set for early 2017



PMR report on emissions trading released in March 2016



GNARLY TREE
SUSTAINABILITY
INSTITUTE

SPEA

Lead for the Greater Good



CLIMATE FOCUS

Primary Decisions in Carbon Tax

- Which fossil fuels will be taxed?
- Will other sources of greenhouse gases be taxed?
- In which sectors will they be taxed?
- How high will the tax be?
- Where in the supply chain will the tax on carbon emissions from fossil fuels be levied?
- How should the revenue be used?

Message #1: There are relatively clear answers to these questions.

The “Ideal” Carbon Tax

- Which fossil fuels will be taxed?
 - *Tax the carbon emissions from all fossil fuels – coal, petroleum and natural gas*
- Will other sources of greenhouse gases be taxed?
 - *Yes, because non-fossil fuel sources make up ~24% of global emissions*
- In which sectors will they be taxed?
 - *The tax should be applied as broadly as possible to minimize the cost of any given level of abatement*
- How high will the tax be?
 - *Set at the “social cost of carbon”*
 - *The tax should be set at the same price per ton across all sources*
 - *Alternatively, at a level that will lead to the target emissions reduction level*
- Where in the supply chain will the tax on carbon emissions from fossil fuels be levied?
 - *To minimize administrative costs, target all the way upstream – coal mines, oil refineries, NG processing plants and ports*
- How should the revenue be used?
 - *Return it to the treasury’s general fund for use to reduce distortionary tax or debt*



What have Governments Actually Done?

- We are studying 18 governments that have established explicit carbon taxes

Australia

British Columbia

Catalonia

Chile

Denmark

Finland

France

Iceland

India

Ireland

Japan

Mexico

Norway

Portugal

South Africa

Sweden

Switzerland

United Kingdom

Message #2: Many governments have already implemented carbon taxes and we can learn from them.



Abbreviated Summary of Experience to Date

Government	Fossil fuel types covered	Other GHGs?	Coverage % GHGs	Sectors Covered/Exempted	Price 2015 US\$/ton CO ₂ e	Point of Application	Use of revenue
<i>Australia</i>	All	Yes	60	Major industrial users (25,000 or more CO ₂ e emissions annually)/ Agriculture, fishing, forestry, legacy emissions, fugitive emissions from closed mines	NA (Repealed in 2014)	Midstream and upstream	Low income individuals Energy intensive co's Coal-fired electricity
<i>British Columbia</i>	All	No	70	Most economic sectors/Exports, inter-jurisdictional transportation, industrial processes, fugitive emissions, greenhouse operations, fuel for agriculture	22	Midstream on fuel distributors	Low income individuals Business tax reductions
<i>Catalonia</i>	Gas fuel, Diesel	No	NA	Transportation – passenger and light commercial vehicles under 3.5 tons/Historic vehicles, diplomatic and emergency vehicles, LEV's	NA (Monthly fee based on emissions)	Downstream on passenger and light commercial vehicles	Climate change mitigation and adaptation
<i>Chile</i>	All	No	55	Electricity plants equal to or larger than 50 MW	5	Midstream on electricity plants	Education
<i>Denmark</i>	All	No	45	Most economic sectors/Transportation, EU ETS sector, for process emissions	31	Downstream	Environmental programs Industry tax deductions
<i>Finland</i>	All	No	15	Most economic sectors/Electricity, commercial yachting, commercial aviation	48-83	Downstream	Income tax reductions Decreased employer SS payments

British Columbia: exempts fuel in agriculture

Chile: earmarks the tax for education

Abbreviated Summary of Experience to Date

Government	Fossil fuel types covered	Other GHGs?	Coverage % GHGs	Sectors Covered/ <i>Exempted</i>	Price 2015 US\$/ton CO ₂ e	Point of Application	Use of revenue
<i>France</i>	All	No	35	Most economic sectors/ EU ETS sectors, public transport, taxi operators, farmers, air transport, fishing, navigation shipping	24	Downstream	Reduced corporate income taxes Energy transition Building renovations
<i>Iceland</i>	Gas, oil	No	50	Most economic sectors/ EU ETS sectors, international transportation	10	Downstream	NA
<i>India</i>	Coal	No	46	Coal industry/ Coal mined by local tribes in State of Meghalaya	6	Upstream at mine mouth	Clean energy and environment
<i>Ireland</i>	All	No	40	Most economic sectors/EU ETS sectors, agriculture	28	Downstream	Deficit reduction
<i>Japan</i>	All	No	90	Most economic sectors/Heavy oil for agriculture, forestry, fisheries, rail transportation, shipping	3	Downstream	Clean energy technology Energy efficiency
<i>Mexico</i>	Coal, oil	No	40	Primarily energy sector	1-4	Upstream on producers and importers	Climate change mitigation and adaptation

Mexico: Only taxes coal and oil

Japan: sets tax at only \$3/ton



Abbreviated Summary of Experience to Date

Government	Fossil fuel types covered	Other GHGs?	Coverage % GHGs	Sectors Covered/Exempted	Price 2015 US\$/ton CO ₂ e	Point of Application	Use of revenue
Norway	Oil, gas	No	50	Most economic sectors/Partial exemption for EU ETS sectors, except for offshore petroleum production	4-69	Downstream	General budget Reduced labor taxes Decreased capital income taxes Pension plan for low income individuals Climate change mitigation Renewable energy Energy conservation
Portugal	All	No	26	Most economic sectors/ EU ETS sectors	5	Downstream	Low income individuals
South Africa	All	Yes	75	All sectors involving fossil fuel combustion, industrial processes, product use, and fugitive emissions/waste and land use, international flights and ships	8.50	Downstream	Electricity levy reduction Energy efficiency Solar tax credit Renewable energy Low income individuals Public transport Rail transport
Sweden	All	No	25	All sectors involving heating and transportation/Partial exemptions for industry and agriculture	168	Downstream	General fund
Switzerland	All	No	30	Heating and lighting for households and businesses/ Motor fuels, EU ETS sectors	87	Downstream	Reduced health insurance premiums Decreased SS contributions Building energy efficiency Technology development
United Kingdom	All	No	25	Electricity generation covered by EU ETS/Combined heat and power plants that use electricity on-site	16	Midstream	NA

Norway: has different tax levels for different sources

South Africa: only country that taxes non-fuel GHG's

Sweden: partially exempts industry

Switzerland: uses funds to fund health insurance and promote technology



Why the Deviation from the Theoretical “Ideal”

- Pre-existing or future programs, standards, or regulations
- Countries are not primarily motivated by cost-effective reductions in GHG emissions
- Politics (power)

~~Message #3: Countries are very naughty and do not listen to their economists.~~

Message #3: There are many forces that shape the design of carbon taxes. These need to be recognized and addressed at the outset.



Context Specific Design Decisions

- Should the tax level be constant or change over time?
- Should there be a mechanism for adjusting the tax level in response to economic and political developments?
- Should offsets be included? If so how should they be designed?
- Should the design include border adjustments to protect domestic industries?
- Which government unit should administer the tax (e.g., tax authority or environmental authority)?
- How should the program be designed to minimize corruption and tax evasion?
- Which complementary policies (e.g., regulations, information campaigns, technical support, research and development) should be adopted, if any?
- Are there legal constraints on the design of the carbon tax?

Message #4: Design of a carbon tax is highly context-specific. Understand your political, economic, legal environment before starting.



Questions Government Policy Analysts are Asking

- Should we use taxes or marketable allowances?
- What other policy instruments should we use (also/instead)?
- Can we eventually transition to a marketable allowance program?
- Can carbon taxes survive politically?
- How much revenue will we raise?
- How long will the revenue stream continue?
- How will carbon taxes contribute to economic development?
- How do we protect low-income households?
- How do we protect our energy intensive exporting industries?
- How do we monitor emissions of fossil fuel CO₂ and non-fossil GHG?

And what they are not asking?

- How do we hit an emissions reduction target?
- Is this an efficient way for the government/world to reduce emissions?



If it looks difficult...take heart

“Policy is very easy.”

-- Donald Trump

Thank You

Kenneth R. Richards

Professor, School of Public and Environmental Affairs

Consultant, Gnarly Tree Sustainability Institute

kenricha@indiana.edu



GNARLY TREE
SUSTAINABILITY
INSTITUTE