Environmental and Energy Study Institute

Fact Sheet

Carbon Pricing around the World
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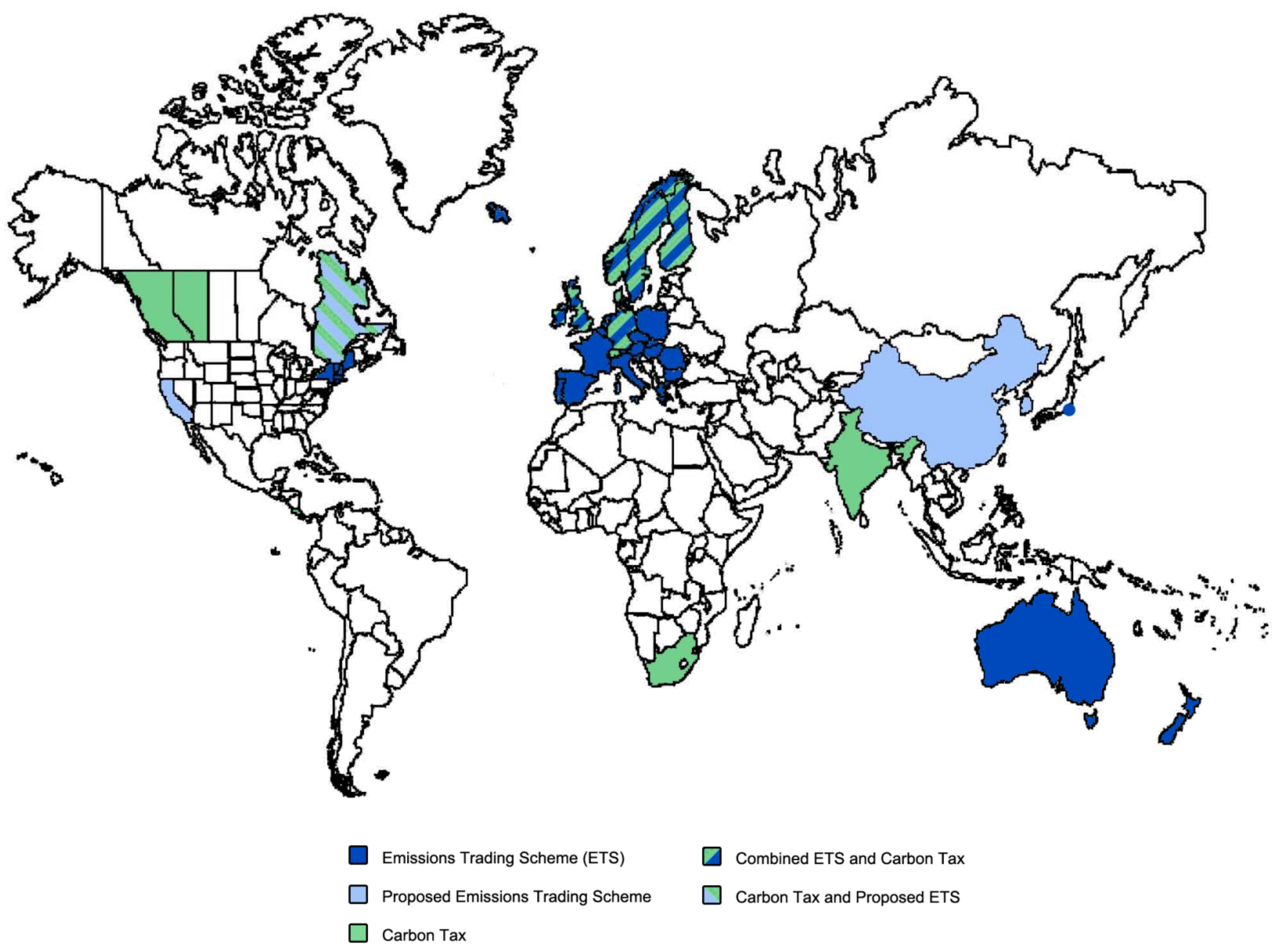
Carbon pricing is any government policy that puts a price on carbon emissions. Carbon pricing can take the form of a tax or a market-based mechanism, such as an emissions trading scheme. Since Finland introduced the world's first carbon tax in 1990, many governments have implemented or proposed some form of carbon pricing, as shown in the figure below.



EMISSIONS TRADING SCHEME (ETS)

In an emissions trading scheme (also known as a cap and trade system), an overall cap is placed on carbon dioxide (CO2) emissions. This cap can be lowered incrementally until it reaches a specified target level. Parties responsible for CO2 emissions, such as electricity generators or fuel refiners, obtain allowances (also called permits) to emit a specific amount of CO2 within the cap. These allowances can either be distributed through an auction or freely allocated. Should a participating member of an ETS emit more than the amount of allowances it owns, it must purchase more allowances. These can be purchased from other emitters who do not need all of their allowances and are thereby able to sell off unused ones. The price of emissions allowances is determined by the free market.

Current Emissions Trading Schemes

European Union Emissions Trading Scheme (EU ETS)[1]

- Launched in 2005, it is the largest trading scheme in the world.
- It was planned in three phases: Phase I (2005 – 2007), Phase II (2008 – 2012) and Phase III (2013 – 2020).
- Phase I included all 15 then-members of the EU, Phase II includes all 27 members of the EU, and in 2007, non-members Iceland, Norway and Liechtenstein joined. Switzerland is in negotiations to join the EU ETS for Phase III in 2013.
- The EU ETS will link with the nascent Australian ETS in 2015, when Australian companies will be able to purchase up to 50 percent of their carbon offsets from Europe. EU ETS participants will be able to purchase offsets from Australia after July 2018.
- The EU ETS covers 40 percent of all greenhouse gas emissions in the European Union.
- The market price for carbon allowances in Phase I peaked in April 2006 at €30 ($36) per tonne (metric ton) of CO2, but then decreased to €0.10 per tonne in 2007 because of an excess supply of allowances. Phase I saw a 1.9 percent increase in CO2 total emissions in the EU. Allowances were given freely based on historic emissions.
- During Phase II, prices fell from €30 ($36) per tonne in 2008 to under €10 ($12) per tonne in 2012. The emissions cap for Phase II was set seven percent lower than 2005 EU emissions levels; 10 percent of allowances were auctioned.

Regional Greenhouse Gas Initiative (RGGI)[2]

- Launched in 2009 with a goal of reducing power sector CO2 emissions 10% from 1990 levels by 2018.
- Nine states are participants: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island and Vermont. New Jersey participated until 2011. Observer states and provinces include: Pennsylvania, Quebec, New Brunswick and Ontario.
- Applies to power plants with generating capacity above 25 MW.
- Nearly all carbon allowances are sold by auction. Auction prices for allowances (covering one tonne of CO2) have ranged from $2.06 to $3.51.

Switzerland Emissions Trading Scheme[3]

- The Swiss ETS is a voluntary alternative to the domestic fuel tax.
- About 400 companies participate in the scheme but it covers only about 6.5 percent of Switzerland's annual 52 million tonnes of CO2 emissions.
- Switzerland is in negotiations to join the European Union's ETS.

Tokyo Cap and Trade Program[4]

- Started in April 2010, the program includes over 1,300 buildings with the highest emissions in Tokyo – this covers 20 percent of greenhouse gas emissions in the metropolitan area.
- Large office buildings must reduce emissions by 8 percent, large industries by 6 percent by 2014.
- Carbon credits sold for $142 per tonne of CO2 emissions in initial trading in 2010.[5]

Proposed Emissions Trading Schemes

Western Climate Initiative[6]

- California and Quebec are set to formalize the trading of emissions permits in 2013.
- California will begin auctioning allowances in November. Its cap and trade program is expected to cover 85 percent of California's greenhouse gas emissions.
- California aims to return to 1990 emissions levels by 2020; Quebec aims to reduce greenhouse gas emissions 20 percent below 1990 levels by 2020.

China

- Five Chinese cities – Shanghai, Beijing, Shenzhen, Tianjin and Chongqing – and the provinces of Guangdong and Hubei are preparing pilot cap and trade projects to commence in 2013.[7]
- China plans to implement a national emissions trading scheme by 2015.[8]
- China's goal is to reduce carbon intensity per unit of GDP, but not overall emissions.

South Korea

- The South Korean emissions trading scheme is scheduled to start in 2015.[9]
- Few details are available, but it is likely to cover about 60 percent of S. Korea's greenhouse gas emissions.

CARBON TAX

A carbon tax can take several forms. The most common type is a tax on fossil fuels, such as gasoline, heating oil, natural gas or coal, for their carbon content. Taxes also can take the form of a per kilowatt-hour (kWh) tax on electricity consumption.

Canada

- **Alberta**
  - Companies that produce over 100,000 tonnes of CO2 annually (covers 70 percent of emissions in Alberta) are taxed. Companies can reduce carbon intensity by 12 percent or pay CA$15 (US$15) per tonne of CO2. Tax enacted in 2007.[10]
- **British Columbia**
  - A revenue-neutral tax on the purchase or use of fossil fuels of CA$30 (US$30) per tonne of CO2 emissions was implemented in 2008.[11]
- **Quebec**
  - In 2007, Quebec was first Canadian province to enact a carbon tax.
  - Tax on energy generators, distributers and refiners of CA$3.50 (US$3.50) per tonne of CO2.[12]

Costa Rica

- A tax of 3.5 percent of the market value of fossil fuels has been in effect since 1997.[13]
- Revenues go to a fund that pays indigenous peoples to practice sustainable development and forest conservation.

Denmark

- Introduced the first version of its carbon tax in 1991.
- Since 2005, the tax has been 90 DK ($14.72) per tonne of CO2 emissions on the purchase of fossil fuels.[14]

Finland

- Introduced the world's first tax on carbon in 1990. In 1995, the tax structure shifted from a tax on production of fossil fuels to a tax on consumption of fossil fuels.
- The current carbon fuel tax is €18.05 ($22) per tonne of CO2 for traffic fuels and €9 ($11) per tonne for heating fuels.[15]

Germany

- Introduced a broad ecological tax on energy in 1999, which includes greenhouse gases and environmental externalities. The tax rate was last modified in 2003.
- Tax on petroleum of €0.65 ($0.80) per liter; tax on electricity of €0.0205 ($0.0266) per kWh.[16]

India

- Tax of 50 Rupees ($0.90) per tonne of coal produced or imported in India.[17]
- Goal of reducing carbon intensity per unit of GDP, but not overall emissions.

Ireland

- Tax on the purchase of liquid fossil fuels of €15 ($18) per tonne of CO2 emissions since 2007.[18]

Netherlands

- Instituted tax on carbon content of packaging materials in 2007. Tax ranges from €21 ($25) per tonne on wood packaging to €470 ($573) per tonne on plastic. Goal of recycling 65 percent of plastic by 2012.[19]

Norway

- Tax on offshore petroleum sector increasing to 410 Krone ($72) per tonne of CO2 emissions in 2013.[20]
- Average tax of 130 Krone ($22) per tonne of CO2 for other fuels introduced in 1991.[21]

South Africa

- Approved an economy-wide 120 Rand ($14.65) per tonne tax beginning in 2013.
- 60 percent of the emissions are exempt to lessen the burden on the economy. The exemption decreases 10 percent annually until 2020. [22]

Sweden

- Enacted a carbon tax in 1991; Sweden currently has a carbon emissions tax of 930 Swedish Kronor (SEK) ($139.54) per tonne of CO2 emissions.[23] Industry pays a reduced rate of about 200 SEK ($30) per tonne.[24]
- Separate energy tax of €0.372 ($0.46) per liter of liquid fuels, €0.244 ($0.30) per cubic meter of natural gas, and €0.287 ($0.355) per kilogram of coal to address environmental externalities.[25]

Switzerland

- Emissions tax of 36 Swiss Francs ($37) per tonne of CO2 emissions. Tax can be raised to 60 Swiss Francs ($61.65) depending on whether the country's emission reduction targets are reached.[26]
- Companies can be exempted if they participate in Switzerland's emissions trading scheme.

United Kingdom

- **Carbon Reduction Commitment (CRC) Energy Scheme**[27]
  - CRC is an energy efficiency scheme for non-intensive industries that fall outside the EU ETS. Launched in April 2010, participants include supermarkets, water companies, banks, local authorities (including state-funded schools) and all government departments.
  - Applies to organizations that have metered electricity consumption greater than 6,000 MWh per year. Accounts for about 10 percent of Britain's emissions.
  - Starting in 2012, participants buy allowances from the government each year to cover their emissions from the previous year. The price of allowances was set at £12 ($18.66) per tonne of carbon dioxide.
- **Climate Change Levy**
  - A tax on energy use was enacted in 2001: electricity tax is £0.00509 ($0.0079) per kWh, natural gas is £0.00177 ($0.0025) per kWh, petroleum and diesel is £0.0137 ($0.0177) per kilogram.[28]

United States

- **Boulder, Colorado**
    - Enacted carbon tax in 2006 on electricity consumption of $0.0049 per kWh for residential users, $0.0009 per kWh for commercial, and $0.0003 per kWh for industrial.[29]
    - Tax set to expire in 2013.

- **California Bay Area**
    - A tax of $0.042 per tonne of CO_2 emissions in the Bay Area Air Quality Management District has been in effect since 2008.[30]

Carbon Tax / Emissions Trading Hybrid Systems

Australia Emissions Trading Scheme

- Implemented an emissions trading scheme in July 2012 where companies can purchase an unlimited amount of fixed-price permits for AU$23 (US$24) per tonne of carbon dioxide emissions.[31]
- Costs to consumers are offset through a reduced tax burden for lower and middle-class income earners.
- The cost of the permits will increase at a nominal rate of 5 percent per year until 2015, when the existing system will transition into an emissions trading scheme linked with the EU ETS.
- By July 2018 the two markets will be fully integrated, with permits traded between the Australian and EU systems.[32]

New Zealand Emissions Trading Scheme[33]

- The scheme began in 2008, with different economic sectors entering the scheme at different times – forestry entered in 2008; energy, liquid fossil-fuel, and industrial processes in 2010; waste in 2013; agriculture (the number one CO_2 emitter in New Zealand) in 2015.
- Currently there is no cap on emissions with an unlimited number of emissions permits sold at NZ$25 (US$20). Permits currently allow for two tonnes of CO_2 emissions, making the price NZ$12.50 (US$10) per tonne. In 2015, permits will only allow for one tonne of emissions.
- Transition to emissions trading with a hard cap on emissions in 2015.

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The Environmental and Energy Study Institute (EESI) is a non-profit organization founded in 1984 by a bipartisan Congressional caucus dedicated to finding innovative environmental and energy solutions. EESI works to protect the climate and ensure a healthy, secure, and sustainable future for America through policymaker education, coalition building, and policy development in the areas of energy efficiency, renewable energy, agriculture, forestry, transportation, buildings, and urban planning.

This issue brief is available electronically (with hyperlinks and endnotes) at www.eesi.org/papers.

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