



Policy Intervention, Carbon Price and Industry

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Today's Agenda

Southeast Asia and
Carbon Price

Carbon Price and
Singapore Industry



I. Southeast Asia and Carbon Price

Global Carbon Emissions

Hsiang & Kopp 2018
 file:///C:/Users/Vinod/Dropbox/References/economist%20guide%20to%20climate%20science%20JEP%202018.pdf

<i>Country</i>	<i>Cumulative 1751–2014</i>		<i>Emissions 2014</i>		<i>Emissions per capita (tonnes CO₂), 2014</i>
	<i>(gigatonnes CO₂)</i>	<i>% of Global</i>	<i>(gigatonnes CO₂)</i>	<i>% of Global</i>	
China	174.7	12%	10.3	30%	7.5
United States	375.9	26%	5.3	15%	16.2
India	41.7	3%	2.2	7%	1.7
Russia / USSR	151.3	11%	1.7	5%	11.9
Japan	53.5	4%	1.2	4%	9.6
Germany	86.5	6%	0.7	2%	8.9
Iran	14.8	1%	0.6	2%	8.3
Saudi Arabia	12.0	1%	0.6	2%	19.5
South Korea	14.0	1%	0.6	2%	11.7
Canada	29.5	2%	0.5	2%	15.1
Brazil	12.9	1%	0.5	2%	2.6
South Africa	18.4	1%	0.5	1%	9.1
Mexico	17.5	1%	0.5	1%	3.8
Indonesia	11.0	1%	0.5	1%	1.8
United Kingdom	75.2	5%	0.4	1%	6.5
<i>World</i>	1,434.0	100%	34.1	100%	4.7

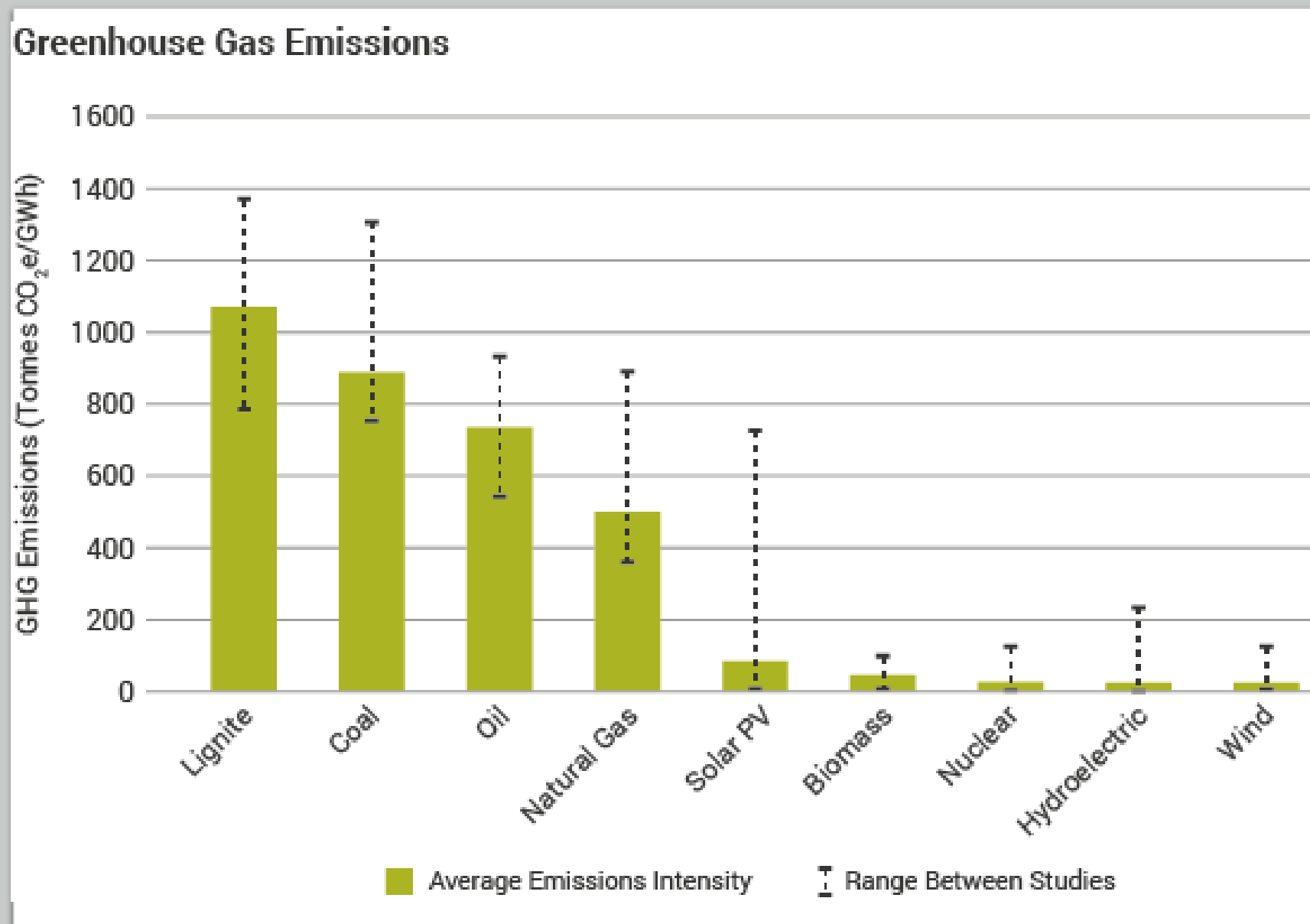
Southeast Asia and the Climate Challenge

Southeast Asia is most vulnerable, but headed the wrong way on carbon emissions -- IMF

The region needs to shift rapidly from burning fossil fuels to using renewables like solar and wind.

Needed are investments and policy changes to accelerate: (i) mitigation (example: decarbonization) and (ii) adaptation (like seawalls & drainage).

Choices for Reducing the Carbon Footprint



Southeast Asia's need for Carbon Pricing

- **Emission Trading System** (cap-and-trade system) as in China or EU. It caps emissions and allows industries with low emissions to sell extra allowances to larger emitters.
- An **Import Tax** on Carbon as proposed by EU: It is a charge on the carbon content of imports.
- A **carbon tax** as in UK or British Columbia. It directly sets a tax rate on emissions or the carbon content of fossil fuels.

1. Cap and Trade: case of EU

A cap, that is reduced over time, is set on the total carbon that can be emitted.

Regulated entities buy or receive emissions allowances, which they can trade.

At the end of each year, regulated entities must surrender allowances to cover their emissions.

When allowances are auctioned, revenues are generated that can be ploughed back into green investments.

Some 40 countries, including China, Japan and South Korea, have such schemes, at varying stages of implementation.

Since 2005 in the EU, emissions were cut by 42.8% in power and heat generation and energy-intensive industry.

2. Import Tax on Carbon: EU; USA?

- [One-fifth](#) of global effluents are embedded in trade: instead of a 3% increase in “production-based” emissions (i.e., from within a country’s borders) since 1990, [the US](#) shows a 14% rise of “consumption-based” emissions (i.e., including emissions in imports).
- EU’s import tariff (CBAM) seeks to stop “carbon leakage’ when producers to relocate to weaker [environmental standards](#); *targeted are cement, steel, aluminium, fertilizer, electricity.*
- Importers can reduce CBAM using carbon prices (emission trade or tax) that exporters already actually paid i.e., net of any “EITI” exemptions.
- Industry would want to note the trade-off between availing likely carbon tax exemptions in SG and paying the CBAM versus paying the carbon tax but being exempted from CBAM to that extent.

3. Carbon Tax: case of British Columbia

- A carbon tax sets a price on carbon by defining a tax rate on GHG emissions, or on the carbon content of fossil fuels.
- More than 40 countries, including Singapore, [have adopted carbon taxes](#), but at different stages and varying rates, from Japan's S\$3.50/ton to Sweden's S\$184/ton.
- A carbon tax policy can raise sizable revenues, which can be used for green investments.
- Since 2008 BC has applied a carbon tax on 70% of GHGs, which is estimated to have “significantly reduced” the emissions.

Outlook for Carbon Tax

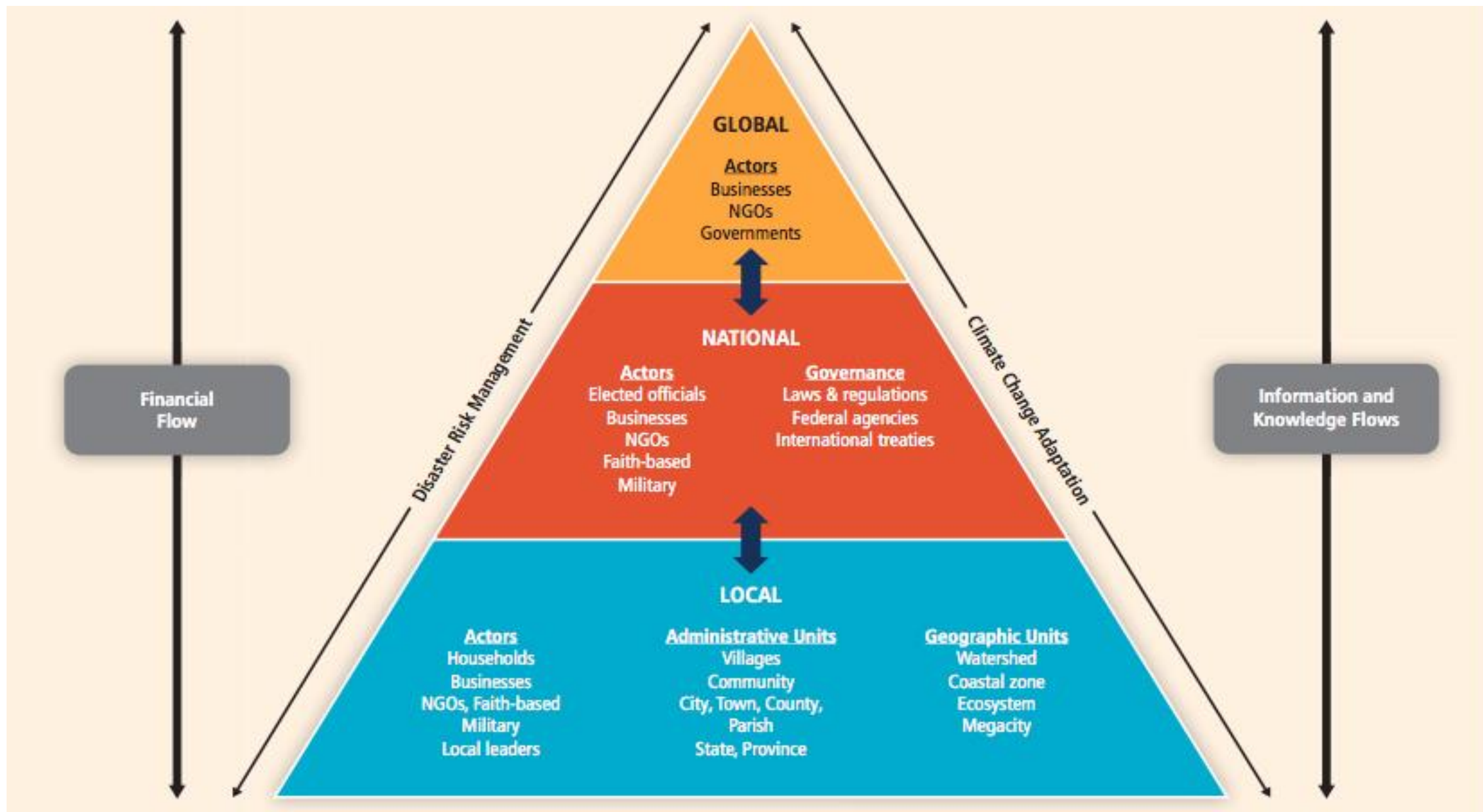
- Average world price of carbon is only US\$3 per gigaton of equivalent carbon dioxide (GtCO₂e).
- Carbon price, in an ideal world, would be decided by spillover harm from activities, and this would be upwards of US\$ 100.
- IMF estimates US\$75 by 2030 to achieve a 23% reduction in global emissions, and limit global warming to 2 degrees centigrade.
- Some make a case for US\$50 by 2030, while experts name over US\$ 100 right away, for any chance of reaching warming targets.
- Industry should anticipate carbon prices to reach a harmonized rate of US\$75 before 2030.



Carbon Tax as Part of Decarbonization

- A carbon tax makes cap and trade, voluntary markets, and green investments easier, but it does not substitute for them.
- In the [US](#) a \$25/ton carbon tax that rises by 1% a year is estimated to cut emissions by 17%-38% by 2030 over 2005. A \$50/ton tax rising by 5% a year would reduce emissions by 26%- 47%—90% of the reductions needed to achieve commitments.
- By setting a price, a carbon tax also signals a value for the development of renewables (that avoid the tax), and investments for green growth.

GOVERNMENT, INDUSTRY, SOCIETY



Source: Figure 5-1, Page 296, IPCC (2012)



II. Carbon Price and Singapore Industry

Singapore's

Energy Mix

Singapore's efforts in climate mitigation need a big boost given the nation's 95% reliance on natural gas.

Power, industry including petrochemicals, and transport are big player in the transition out of fossil fuels.

Net zero carbon by 2050 calls for multiple options in switching to renewables.

Solar energy including imports from Australia, Indonesia, and Hydro from SE Asia are in the near term mix.

Nuclear, hydrogen and carbon sequestration are longer-terms considerations.

Singapore's Commitments

- Singapore accounts for 0.1% of the global carbon footprint, but it is the 27th among 142 countries (2018) in emissions per person.
- The agenda is to enhance the 2030 Nationally Determined Contribution and the Long-Term Low-Emissions Development Strategy.
- Singapore has announced a S\$100 billion climate investment plan for the century, and a 2030 green agenda.
- The Republic needs to make concrete a net-zero timeline and manage industry transformation accordingly.

Singapore's Carbon Tax

- Set at \$5/ton of GHG emissions (tCO₂e) from 2019 to 2023, the rate is raised to \$25 for 2024-25, and \$45 for 2026-2027, with a view to \$50-80 by 2030.
- Provision to partly exempt emission intensive trade exposed (EITE) industries, who have the most tax and can pass it on least, on grounds of avoiding emission leakage.
- Companies may surrender “high quality” international carbon credits to offset up to 5% of their carbon taxes from 2024.

<https://www.channelnewsasia.com/commentary/carbon-tax-why-increase-singapore-budget-emissions-climate-change-2499051>

Likely Implications

- The power sector (39% of emissions) would be the most responsive to the tax in cutting emissions as it is both lower cost and technologically possible to reduce emissions there.
- Manufacturing, waste management, and water sectors are important emitters, directly via their production processes and indirectly as energy users.
- A \$4 increase in monthly utility bills is indicated with a carbon tax of \$25 per ton, offset by U-Save vouchers.

Industry's Leadership

- SG's Green Plan 2030 has multiple fronts: new cars to be “cleaner-energy models”; electric vehicle charging points to double; landfills to be cut; buildings to go carbon neutral.
- Petrochemicals, manufacturing, pharmaceutical, and their underlying energy use to transition out of high carbon to clean.
- Financing from Private Sector: Temasek, BlackRock, Leapfrog signal a scaling up of clean energy projects.
- All hands-on deck, including business' own carbon footprint, for example, aviation, refrigeration, agri-business.

Industry's Response to Carbon Tax

Emission Impact

SG will likely see emission response at around S\$45-S\$50/ton tax.

- This is based on evidence from EU's emission trading that cut emissions of power generation and energy-intensive industries by 43% over the past 16 years.
- Industry will adopt new technologies over time. Carbon intensive electricity will likely improve efficiency to avoid the tax, and switch to solar, thermal, and wind.

Cost Impact

Cost impact of current tax plan on SG's industry is phased.

- In Canada, for a C\$50 carbon tax, four industries—petroleum and coal; manufacturing; electric power; and chemicals—faced unit production cost increases of 5%; forty industries by 1%, rest 0.6%: and the economy, 2.4%.
- In the US, the electric power is estimated to have a far greater impact from a tax than others. The next largest direct impact would be on transportation, wholesale and retail trade.

Diverse Industry Effects in SG

- Power is expected to be most responsive, as it is both cheaper and more straightforward to reduce emissions.
- Unlike power, which is consumed domestically, Singapore exports most of its energy and chemical products. The tax would increase the cost of carbon-intensive products like electricity and transport.
- There are employment impacts. For example, Shell Singapore would cut 500 jobs as it pivots away from crude oil to low-carbon fuel. Exxon would cut 300 jobs due to market conditions.
- Chemicals will remain important for finding sustainability solutions, and so will areas like safety products, surgical gloves, resource conservation, food packaging, through the use of solar panels, EVs and other solutions.
- Companies with net zero targets include DBS, Keppel Land, CDL.

Consumer Impact

- A carbon tax makes oil, natural gas and electricity more expensive, seen through higher utility bills (ex. \$25 per tonne = \$4 per month increase).
- A S\$50 would have a bigger effect on monthly utility bill than S\$25, but not proportionally, i.e., it could be an increase between S\$4-S\$8.
- In EU and British Columbia, the price to consumers did not rise proportionately to tax increases.
- Importantly, there was also a saving, as the carbon revenues were used to cushion the impact. In SG, there can be U-save for poorer consumers and safety nets for SMEs.
- More generally, investing in cleaner sources like solar speeds the availability of alternative energy.

Carbon Footprint of Finance

- International Sustainability Standards Board's [proposed standards](#).
- Important to cover industry's direct emissions and those that are funded by banking and finance.
- The so-called "Scope 3" emissions are GHGs from the investment portfolio of the financial sector rather than those related to their offices or operations.
- Voluntary actions could be ideal, but only 25% of the companies by one estimate reported their financing of emissions, and only on 50% of their portfolios.

Concluding Messages

In tandem with global action in climate mitigation, it's best for Southeast Asia and Singapore to be early movers in carbon pricing.

Singapore's physical constraints to a rapid switch to renewables make a sizable carbon tax imperative to motivate search for all options in decarbonization.

For a significant effect on decarbonization, the carbon tax needs to be bold, and part of climate mitigation by industry in sync with government and society.

Thank you

