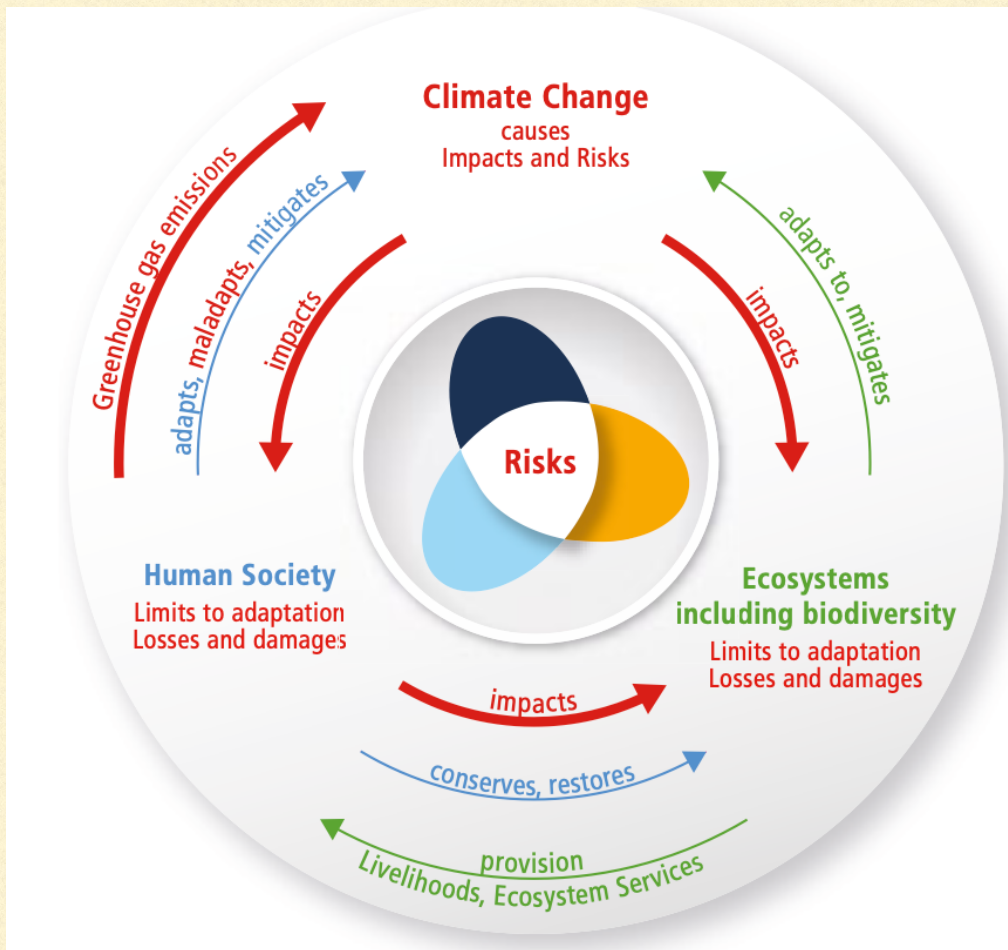




TOPIC 9: ECONOMICS OF CLIMATE CHANGE II

Dr. Supawan Saelim

Climate Change - Impacts and risks



- Impacts and risks on ecosystems
- Impacts and risks on human systems

Roles of Climate Change Policies

Should we invest in a 'planet insurance'?



- We need planet insurance!!! — The question is rather 'How to make a cost-effective investment in planet insurance'
- How to use economic perspectives to frame the discussions about costs and benefits of 'climate change policies' - as risk-reduction strategies
 - Mitigation policies
 - Adaptation policies

■

I. Mitigation Policies

- Investments to reduce the probability of damages due to carbon emissions
- A public good determined by the sum of all nations' efforts to reduce carbon
- A public risk-reduction strategy in which the benefits of reduced risk accrued to all nations
- Address underlying problem of increasing emission levels

How to make the use of fossil fuels less economically advantageous?



Carbon pricing as
a cost-effective risk reduction policies

Carbon tax
Emission Trading systems (ETS)

Why do we need to put a price on carbon?

- As the world is still dependent on the use of fossil fuels, the use of fossil fuel created a number of jobs and is important to economic development.
- It has also enjoyed a subsidy in some countries while they do not need to pay for environmental damages (market failure in capturing external social costs of fossil fuel use).
- Carbon pricing policies are used to correct this failure by internalizing the social cost of carbon into fossil fuel prices.

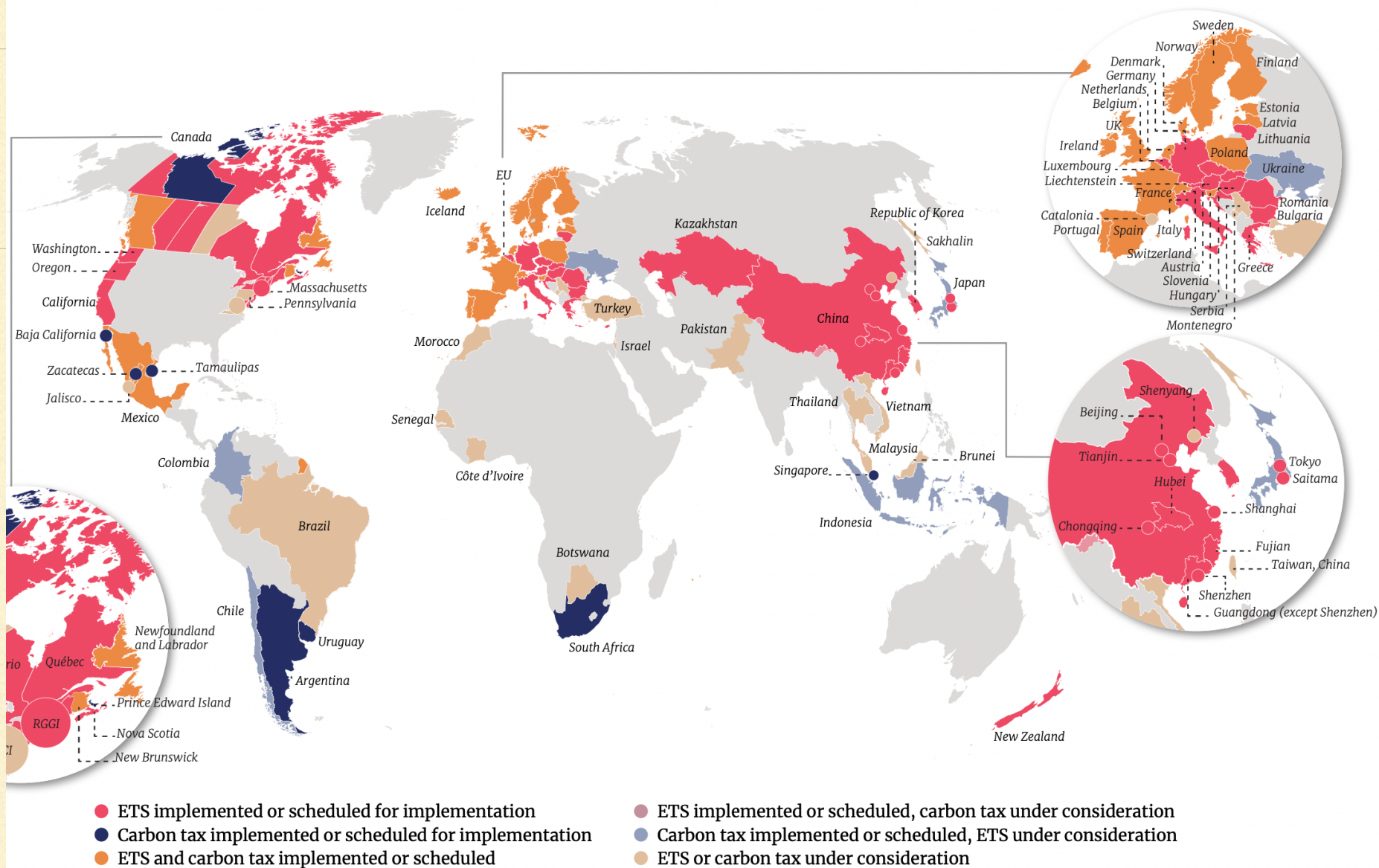
“When a power company is deciding between investing in a new wind farm or a coal-fired power plant, the decision should take into account the cost of pollution on top of the costs of both technologies.”

Carbon tax

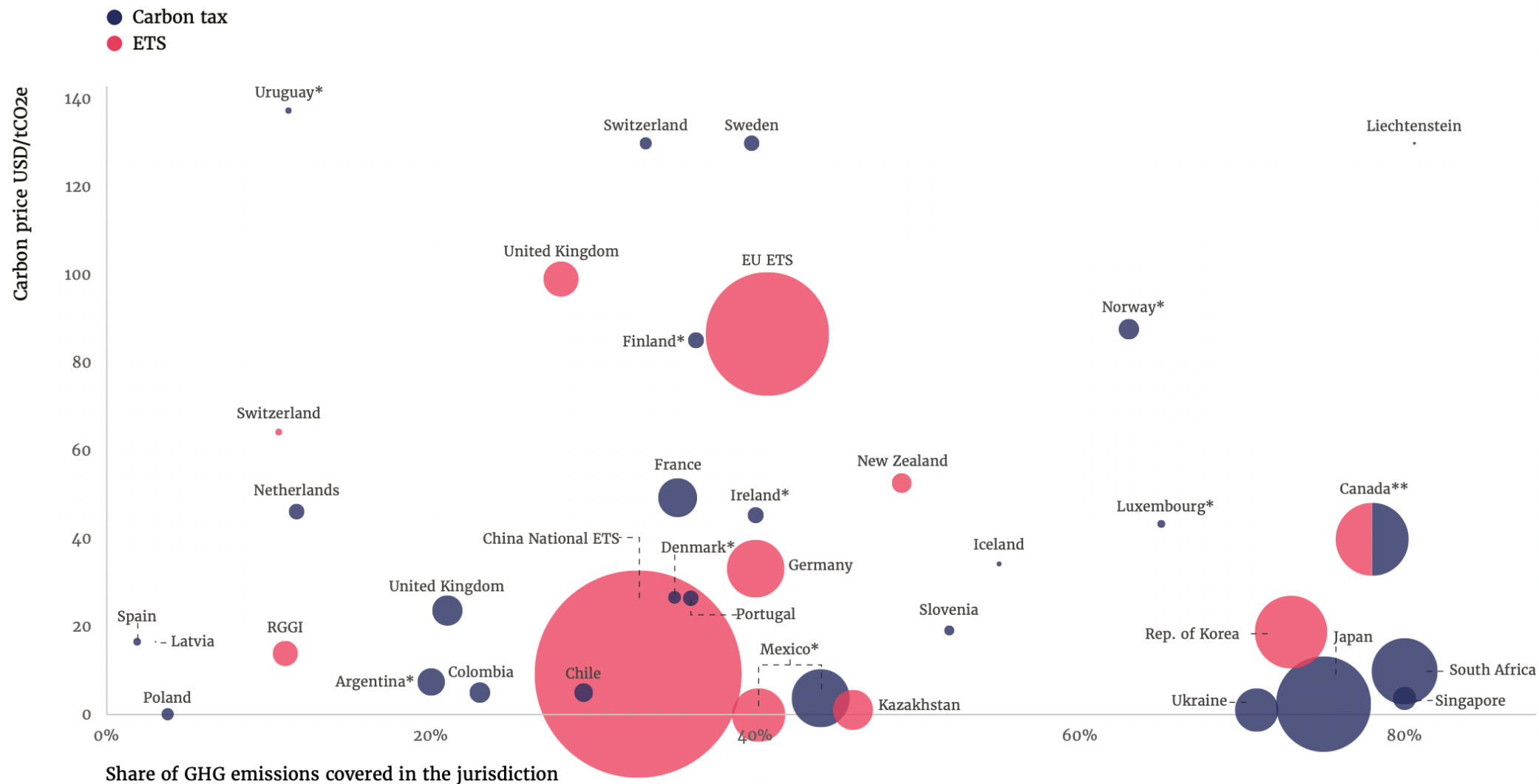
- **Carbon tax** sets a direct tax (or a fee) to the price of fossil fuels such as coal, oil products and natural gas, and other fossil fuels in proportion to their carbon content.
- The tax could put collected in various ways: for example,
 - a tax on domestic fossil fuel consumption,
 - a tax on primary energy inputs on refineries, gas transportation systems, etc.
- Carbon tax is used to change the relative prices between renewable and fossil fuel resources, incentivizing renewable energy use and disincentivize fossil fuel use.
- The tax is usually passed from suppliers to consumers in the form of higher prices for electricity, gasoline, heating oil, and other goods and services that use fossil fuels in their production process.

Emission Trading System (ETS)

- Cap-and-trade system or emission trading system (ETS)
 - Following the Kyoto protocol that established quantitative targets for emission reductions by each country member, the government sets a limit or cap the level of emissions that the country/sector can emit.
 - The countries or companies that reduce emissions below their cap can sell, an unused right to emit, measured in tonnes of CO₂ equivalent while countries and companies that don't meet their target can buy these one-tonne units to make up the shortfall.
 - This market-based mechanism sets allowances on the total amount of carbon emissions released each year, creating a market-based system in which the allowances can be traded from less-carbon-intensive to more-carbon-intensive sectors.
 - High-cost firms can buy permits to emit carbon from low-cost firms. This creates mutual gains between trading partners and guarantee a fixed level of emission reductions.
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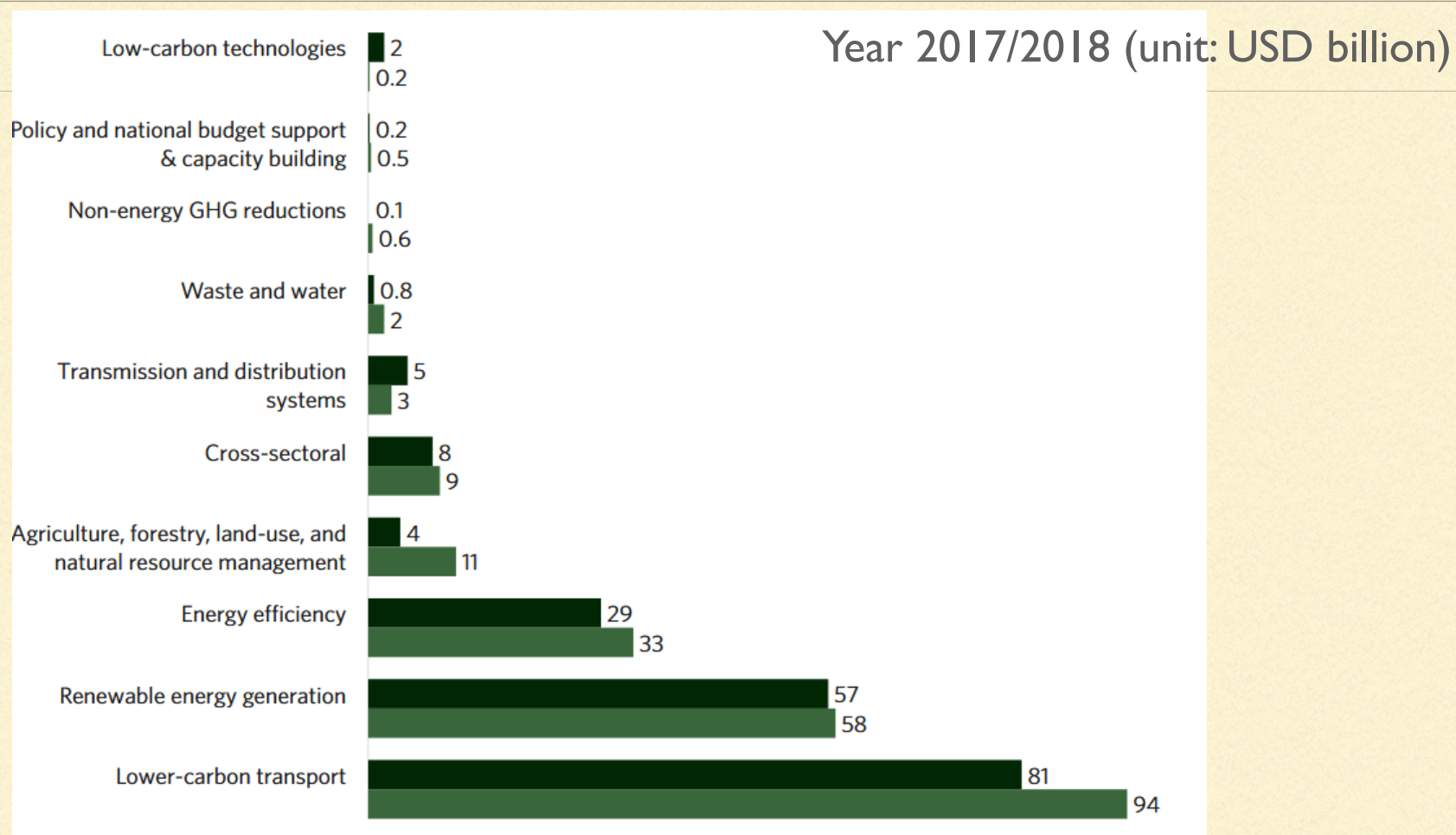


Source: https://openknowledge.worldbank.org/bitstream/handle/10986/37455/9781464818950_Executive_Summary.pdf?sequence=11&isAllowed=y



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Tracking global climate finance to mitigation activities



Source: [Global landscape of climate finance \(2019\)](#)

2. Adaption Policies

- A private good in which the benefits of reduced severity accrued to one nation
- Investments that transfer wealth from good to bad states of nature given a bad event has been realized.

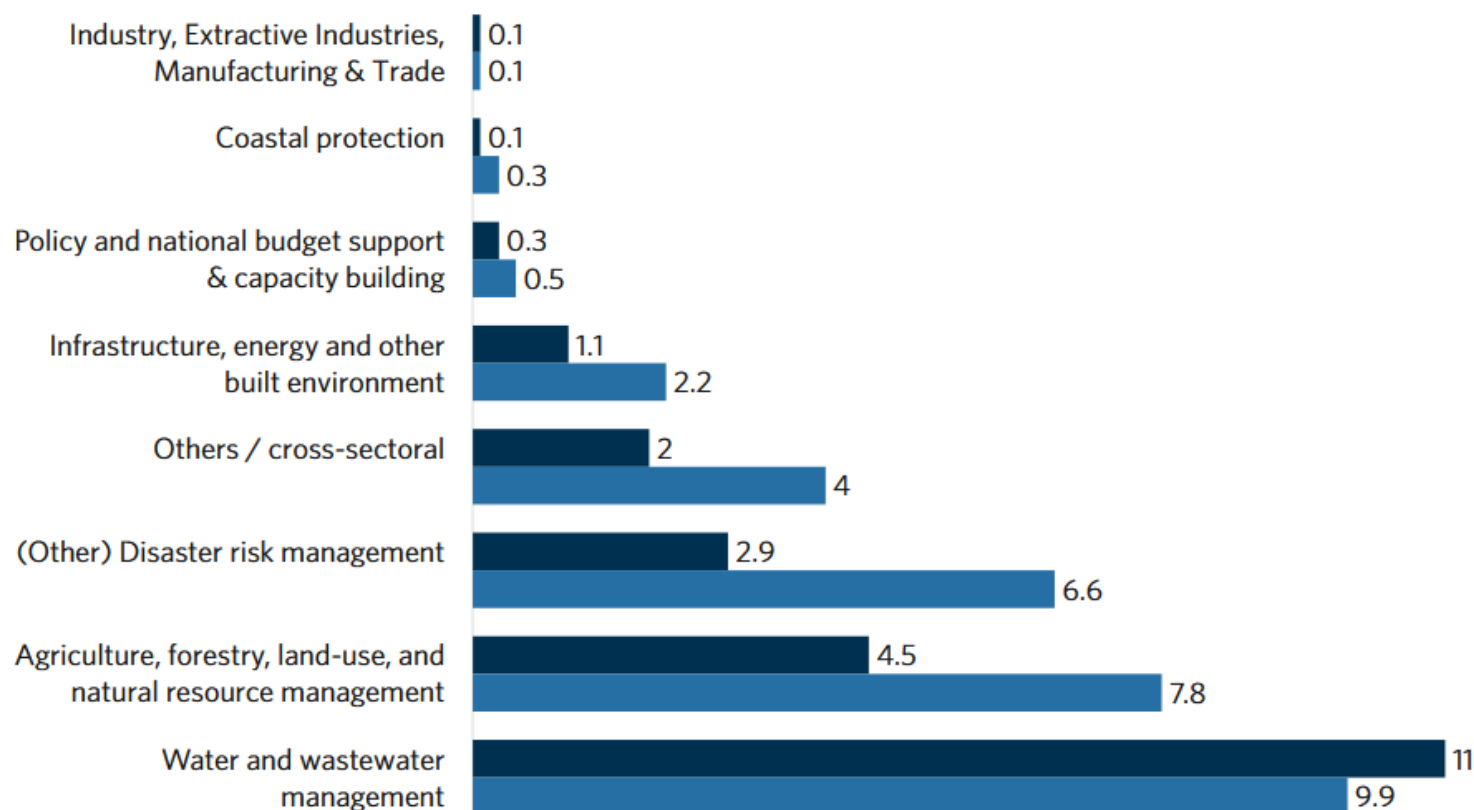
“Adapting to climate change with more resilient infrastructure, securing water resources, improving crop production for dryland farming, protecting coastlines, and other measures can pay a triple dividend. Countries will suffer less from future climate shocks, enjoy greater productivity and growth, and reap social and environmental benefits”

Adaptation can take many forms beyond direct government financing of infrastructure. It involves encouraging the private sector to adapt, social protection after disasters, and a holistic strategy for budgeting and planning that factors in climate change.

According to [a report](#) from the Global Commission on Adaptation, every \$1 invested in adaptation could yield up to \$10 in net economic benefits, depending on the activity. The benefits of adaptation measures are obvious and save money in the long run, but they require up-front costs that are a struggle for many developing economies

Tracking global climate finance to adaptation activities

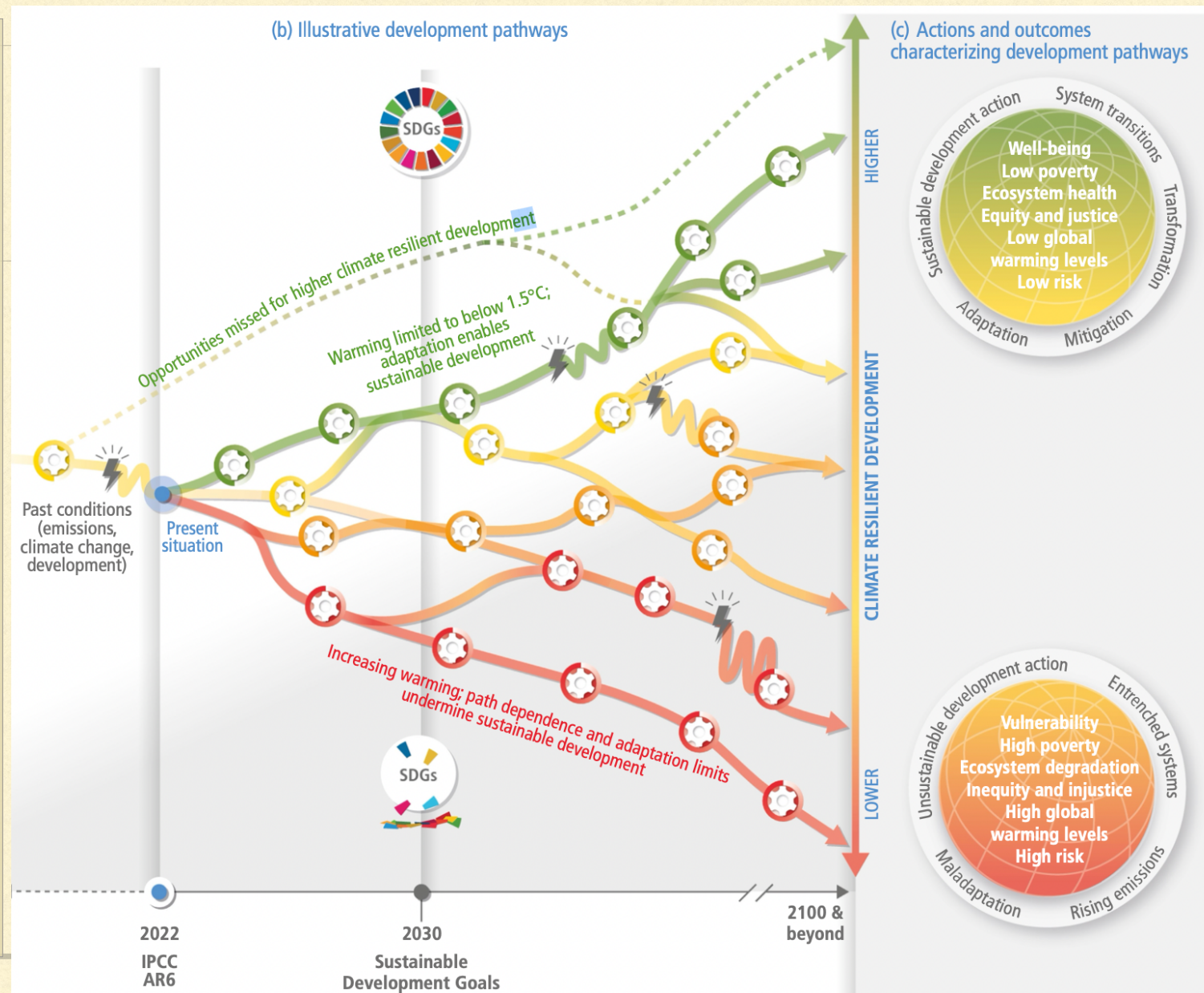
Public Adaptation Finance by Sector, in USD billion



Source: [Global landscape of climate finance \(2019\)](#)

Costs and Benefits of climate policies (Mitigation and Adaptation)

Source: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_SummaryForPolicymakers.pdf



Reference

HSW [HSW] – Hanley, N., Shogren, J. and White, B., Introduction to Environmental Economics 2013 (2nd edition), Oxford University Press, Chapter 9.

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