

ETS and regulated electricity markets

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About ICAP

An international **forum** of **36 national & subnational** governments to **exchange** knowledge and experiences on emissions trading systems (**ETS**)

- Share **best practice** & learn from each others' experiences
- Facilitate **linking** of carbon markets
- Explore the **role** of carbon pricing in climate policy



Overview

- 1. The Promise of Emissions Trading**
- 2. ETS and liberalized power markets**
- 3. ETS and regulated power markets**
- 4. Concluding thoughts**

Why emissions trading?

- **Place a quantity constraint on emissions** – consistent with the “carbon budget” approach
- **Achieves emission reduction targets at least cost**
 - **Static efficiency:** marginal abatement costs are equivalent across covered entities.
 - **Dynamic efficiency:** discounted marginal abatement costs are equivalent through time.
- **Sets in place a clear reduction pathway and “communicates” to investors that high emission investments will not be profitable over the long run.**

ETS can deliver (in theory)

- **1. Production** – producers have an incentive to use less carbon intensive materials
- **2. Consumption** – consumers have an incentive to consume less carbon intensive goods and services
- **3. Investment** - investors are encouraged to invest in less carbon intensive activities, as the value from doing so is diminished.
- **4. Innovation** – provides a financial incentive to develop new products, processes and technologies that are less emissions intensive.

Overview

1. The Promise of Emissions Trading

2. ETS and liberalized power markets

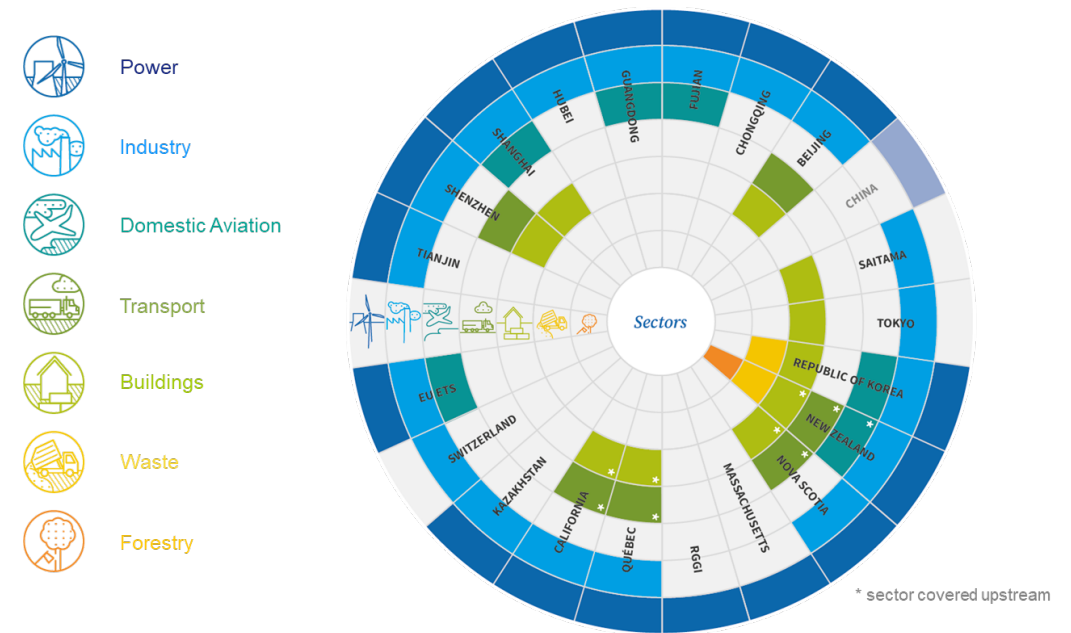
3. ETS and regulated power markets

4. Concluding thoughts

Emissions trading is well suited to the power sector

- Ideal for coverage as few large fossil-based emitters, with clear installation boundaries and simple MRV.
- The sector remains a **major source of emissions** worldwide (42% in 2018, IEA, 2020) and in many jurisdictions represents an important share of emissions, although declining in some regions.
- Reducing emissions from the power sector is **generally cheaper** than in other sectors and **alternative technologies are available** to the market.
- The sector is to play a key role in **decarbonizing heat and transport sectors**.

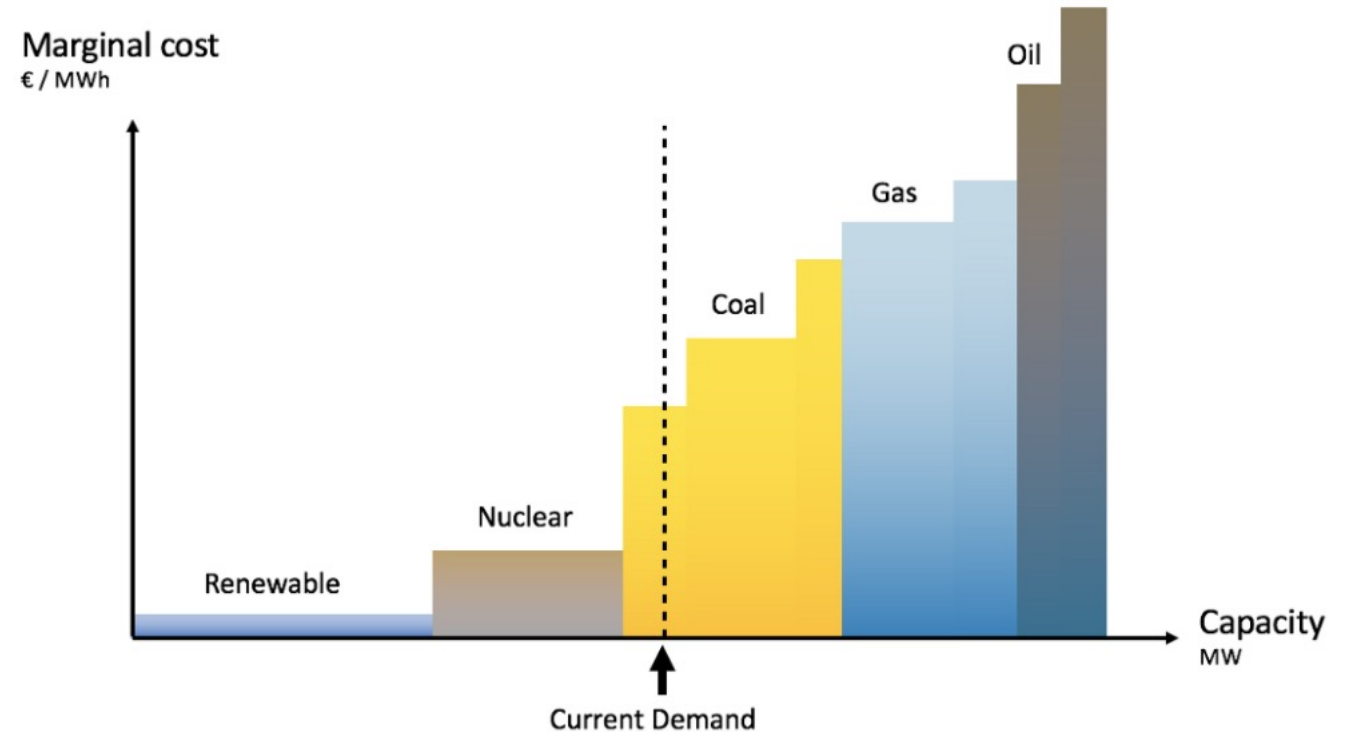
Almost all existing ETS cover the power sector.



ETS will be most effective in liberalized and competitive markets

- **Characteristics of a liberalized electricity market**
 - customers are free to choose their electricity supplier;
 - Electricity is traded on wholesale markets;
 - generators have free access to the market;
 - generation, supply, and networks are unbundled; ensuring competition on wholesale and retail markets; and
 - independent regulators are assigned to monitor the market (Matthes 2017; Ecofys 2016).

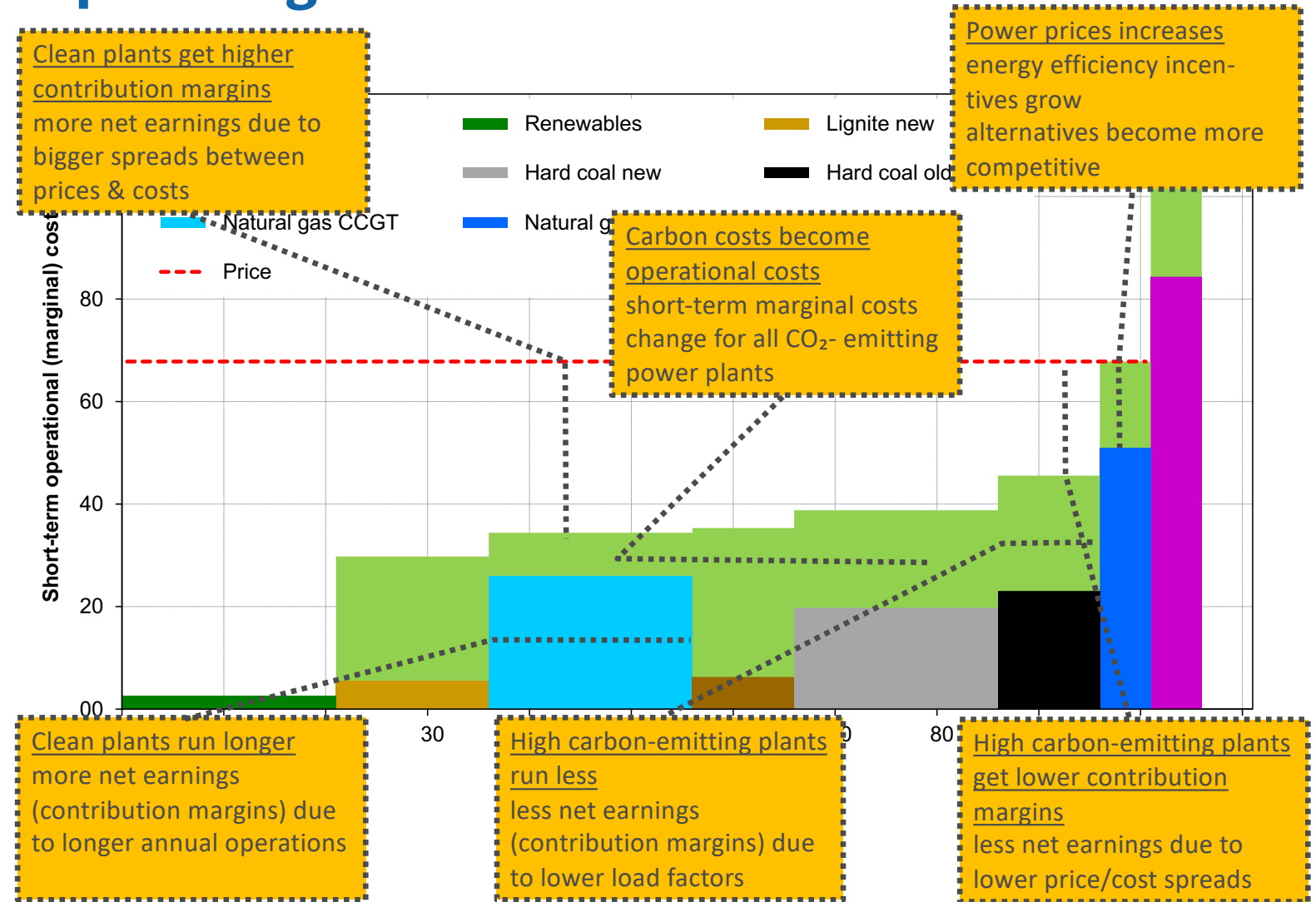
Merit Order Curve



Lowest variable cost generation sources are dispatched first

Carbon price drives multiple mitigation channels

- **Higher power prices** drive low carbon consumption.
- Wholesale market **rewards low carbon generation** (higher margins, plants run longer)
- NPV of high carbon assets decline **encouraging their decommissioning**



Source: Matthes, 2020.

However, structure of the electricity system will impact the role for the ETS

➤ **Existing capacity mix:**

- Shape of the merit order and related electricity costs;
- Opportunities and cost of fuel switching; and
- The likely marginal generator and hence the impact of a given carbon price on wholesale electricity prices.

➤ **Age profile of the fossil fleet:**

- Old plants will have recovered more of their investment costs compared to newer plants, making decommissioning less costly.
- The older the asset profile, the more likely the marginal generator is carbon intensive, therefore increasing electricity prices.

➤ **Companion Policies:**

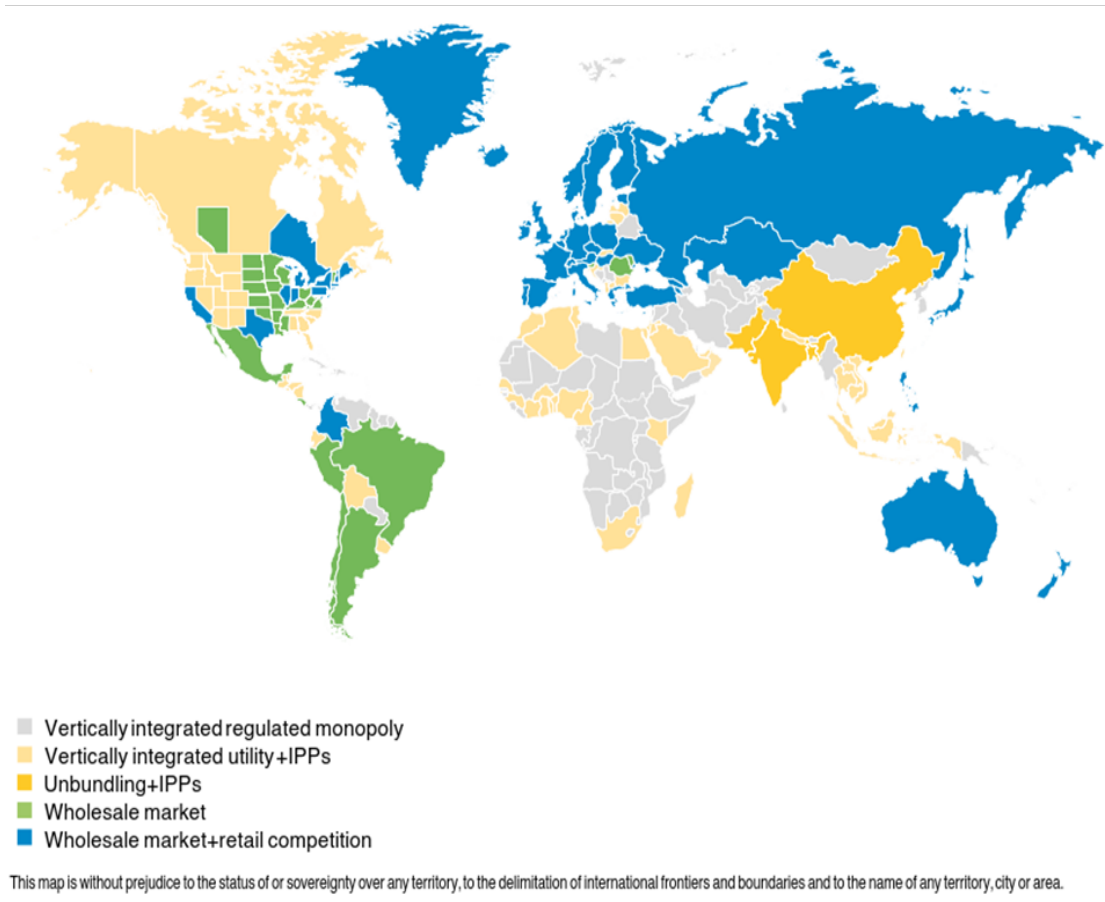
- Long term contracts that operate outside the energy market, capacity remuneration mechanisms, fuel taxes, coal phase out etc.

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But, many countries considering ETS do not have liberalized power markets

Status of global power sector regulation (liberalization)



Different forms of market regulation are common

- Liberalized market with regulated retail prices
 - Markets with regulated wholesale prices
 - Systems with planned (dis)investments
 - Regulated and/or planned production
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- Different forms of electricity sector regulation **interact with ETSs** in ways that may prevent or change how participants respond to the allowance price.

Source: IEA and Renewable Energy and Efficiency Partnership (REEP) Policy Database 2012-2013. Available at:

<https://www.kapsarc.org/wp-content/uploads/2017/08/KS-2017-WB07-Transitioning-to-Liberalized-Energy-Markets.pdf>

Electricity market regulation must be considered in ETS design

- **Non-economic dispatch** – electricity is not prioritized based on economic cost but on average costs or broader criteria.
 - Carbon price can not drive fuel switching, hence no increased running hours for low carbon generation
 - **UNLESS** – allowances costs of generators are considered in dispatch formula (green dispatch).
- **Regulated wholesale tariffs** – focus on cost recovery and not marginal cost pricing
 - Impact of carbon price will depend on tariff methodology (cost plus, rate of return), allocation methodology (share allocated freely), the dispatch formula as well as the existence of cost compensation outside of the market.
 - **Potential for real allowance costs to be reflected in wholesale tariffs with careful design, but limited incentive mitigation where costs are recovered and dispatch guaranteed.**
- **Regulated retail prices** – retail prices do not reflect allowance costs
 - Carbon price will not drive low carbon consumption
 - **UNLESS** – indirect emissions are also covered under the ETS

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Concluding thoughts

1. ETS will be **most effective** in liberalized and competitive power systems.
 - But **market structure and companion policies** will shape the role of the ETS in mitigation choices.
2. ETS can be effective in regulated power markets, **but requires careful design**
 - **Environmental dispatch** combined with **indirect emissions coverage** can provide some of the benefits of an ETS
 - But ultimately, reforms are required to ensure **retail prices** reflect carbon intensity over the medium to long term and other market services are valued (e.g. flexibility)
 - Carbon revenues can ensure that such **policies are progressive**.
3. Carbon pricing and **future power market design** requires more thought
 - Can marginal pricing continue to provide a stable investment framework with **large shares of variable capacity**?

Back up slides.

