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Mercator Research Institute on  
Global Commons and Climate Change

# Closing the emission price gap

## A multiple dividend approach to carbon pricing

Michael Jakob

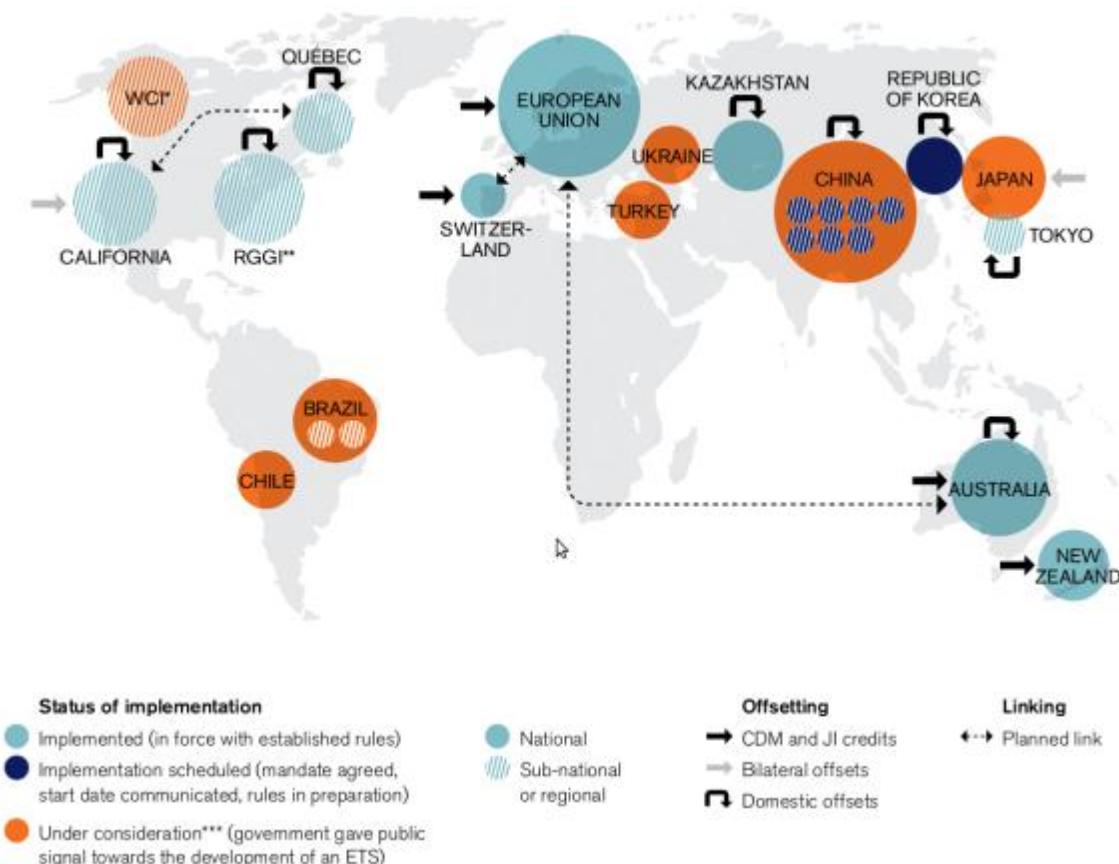
Based on the paper by Edenhofer, Jakob, Creutzig, Flachsland, Fuss, Kowarsch,  
Lessmann, Mattauch, Siegmeier and Steckel

Input for the Workshop “Closing the Carbon Price Gap:  
Public Finance and Climate Policy”

Berlin, 22 May 2014

# The emerging landscape of carbon pricing

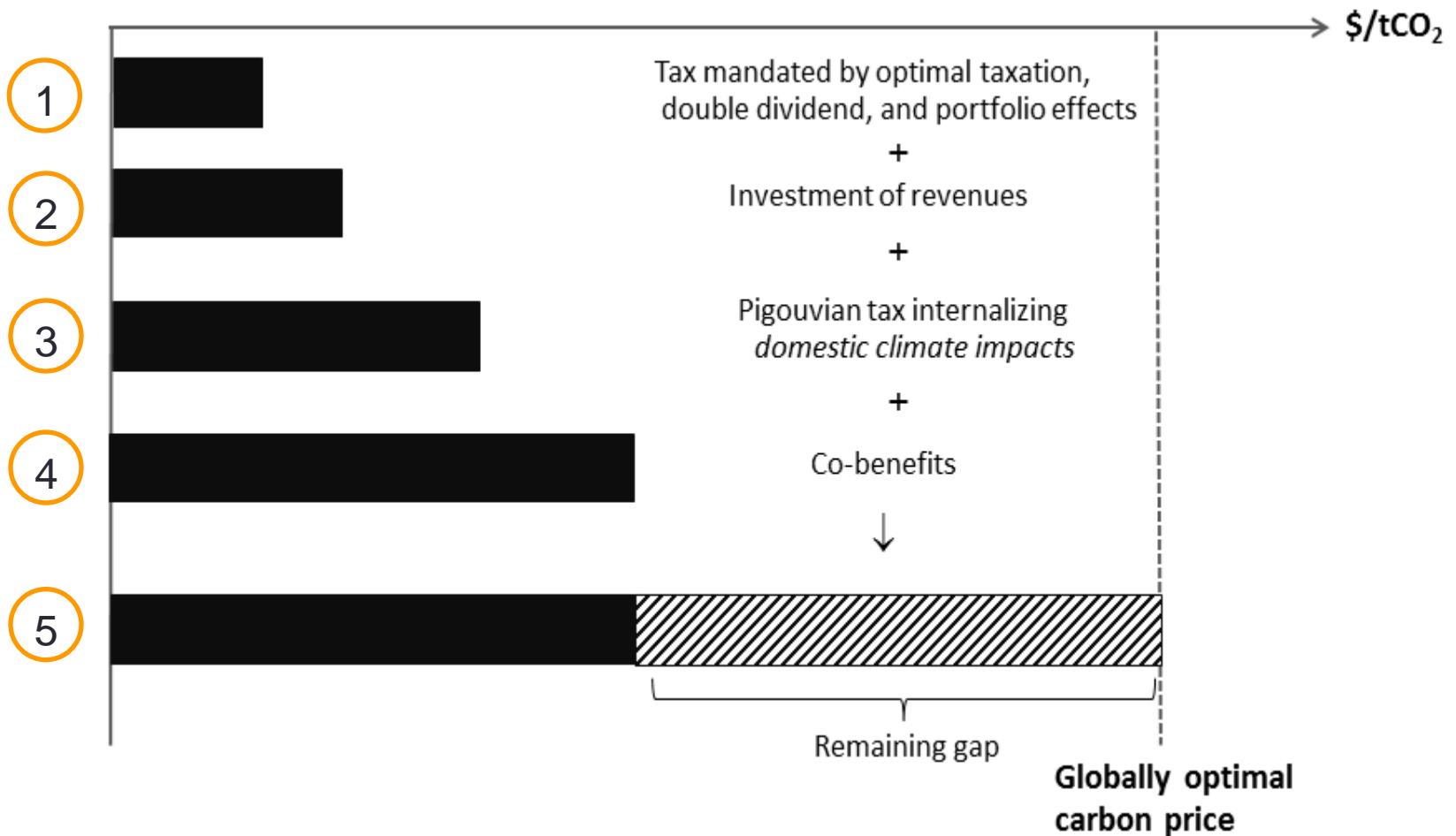
Figure 1: Map of existing, emerging, and potential emissions trading schemes



Source: World Bank (2013), Mapping Carbon Pricing Initiatives, Carbon Finance at the World Bank, Ecofys

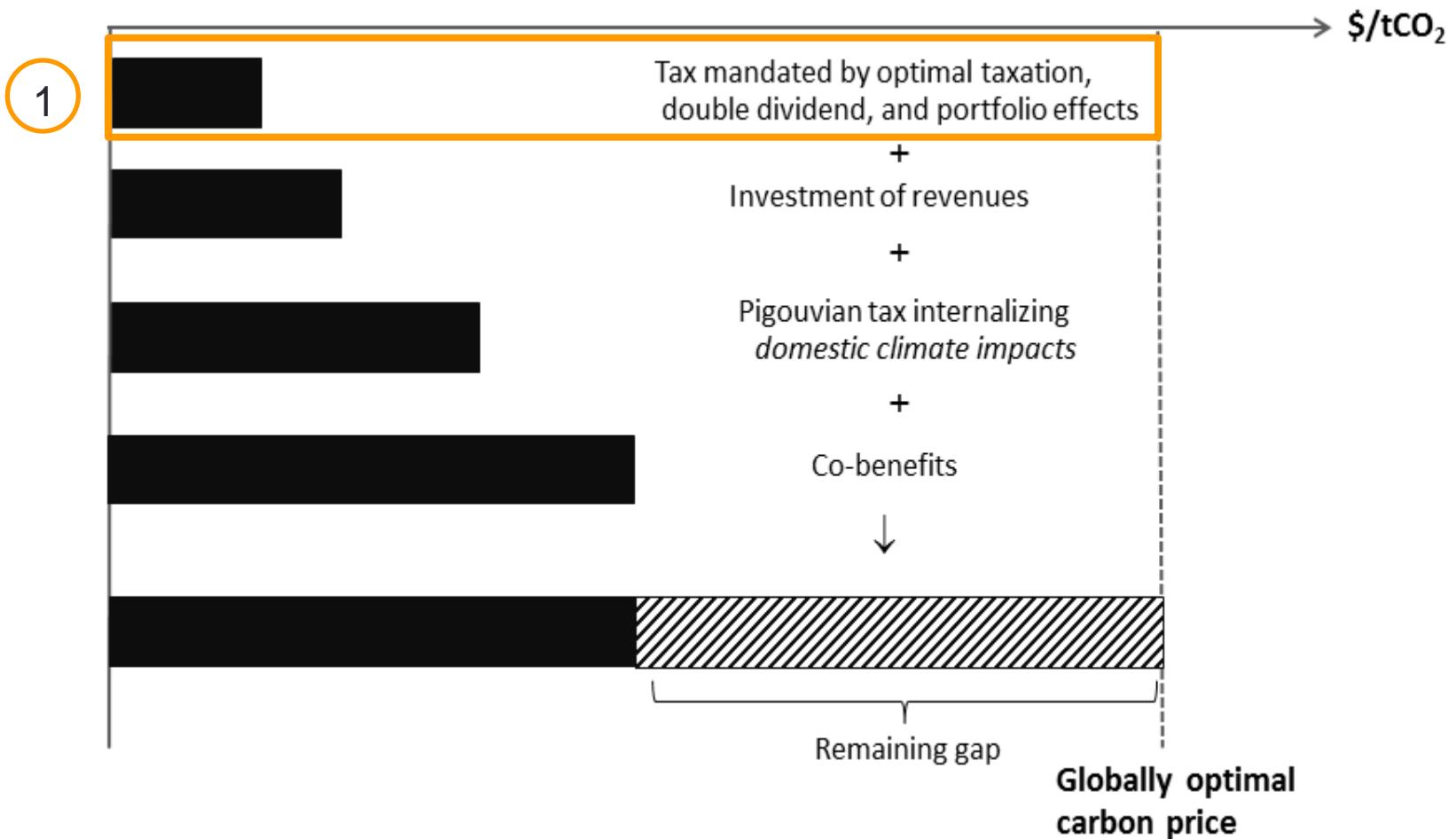
- Globally uniform emission price optimal to address global externality
- This would require global cooperation; hampered by free-riding
- Nevertheless, some recent regional advances to carbon pricing

# Outline



- Important unilateral incentives to adopt an emission price
- Unilateral emission pricing could bring us closer to the optimal emission price and ease negotiations of a future global climate agreement

## Revenue Side



## Traditional Arguments: Ramsey Rule and Double Dividend

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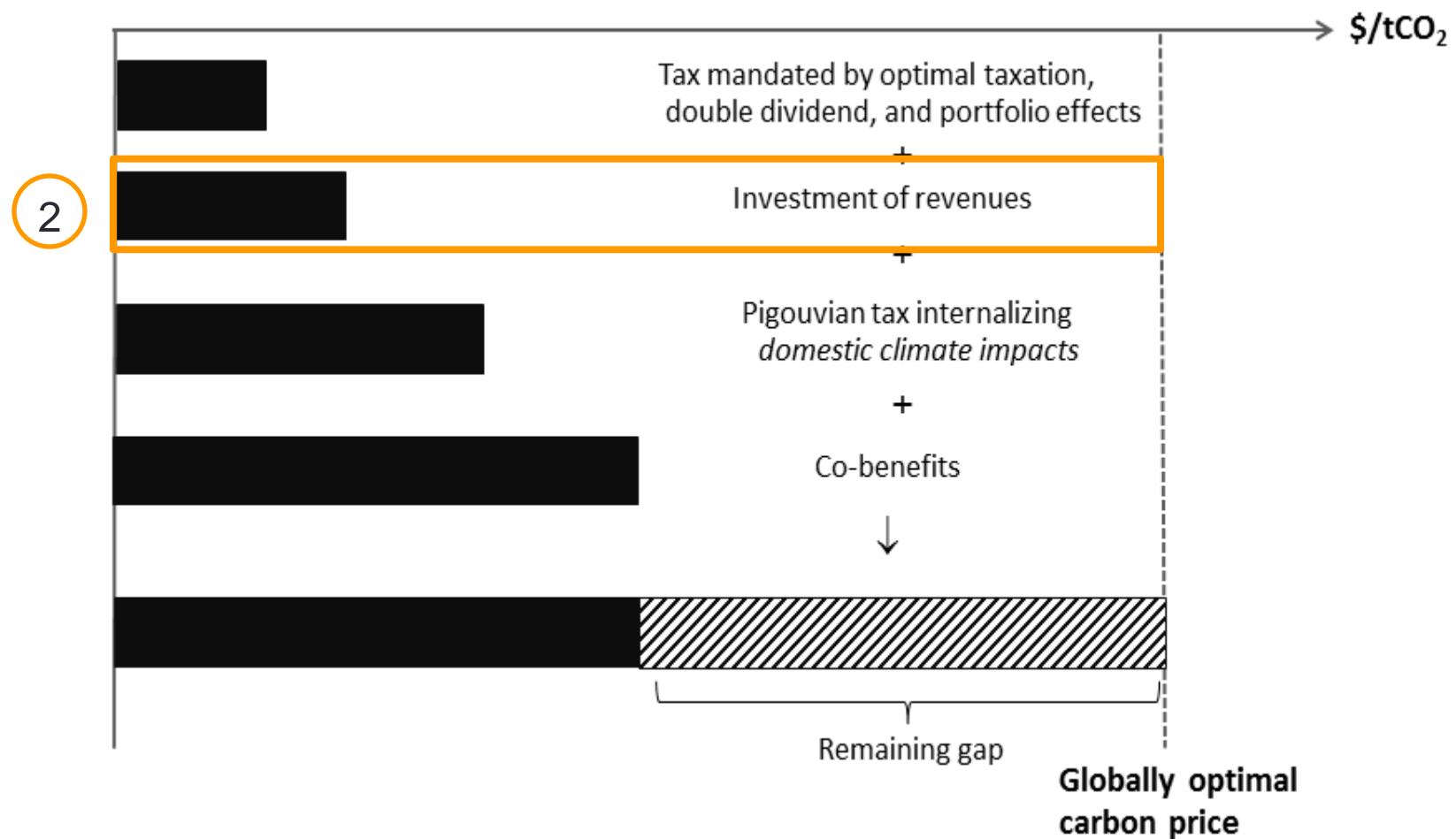
- In order to raise a given amount of public income, all economic factors should be taxed inversely to their elasticity of supply (**Ramsey rule**)
  - Carbon tax would hence be mandated even if climate change were not an issue
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- **Double dividend:** imposing CO<sub>2</sub> price and reduce labor and capital taxes lowers costs of climate policy (e.g. Goulder 1995, Parry 1995)
  - Could also be used to pay back public debt (Rauscher 2013) and broaden the tax base in countries with large informal sector (Markandya 2013)

## Emerging arguments: Portfolio effects and tax competition

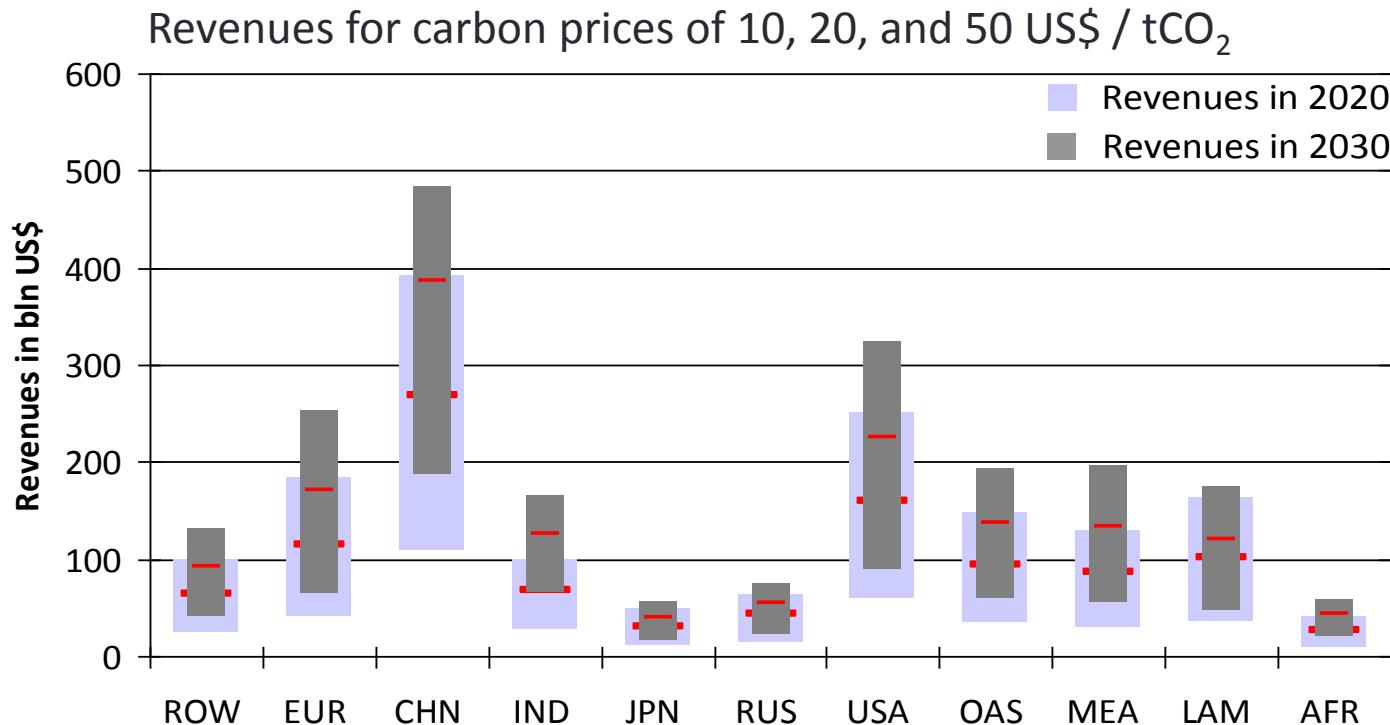
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- Over-investment in fixed factors (such as fossil fuels, land ) creates economic inefficiencies and slows down economic growth (Edenhofer et al. 2013)
- Hence, taxation of carbon emission and/or land can reduce this inefficiency (Siegmeier et al. in preparation) to achieve **optimal balance of portfolio**
- Social rate of return equal for all forms of capital (i.e. “no arbitrage condition”), otherwise there is **over- or under-investment**
- Capital mobility distorts interregional allocation through **tax competition**, capital tax more prone to tax competition than carbon tax (Franks et al. 2014)
- Infrastructure financed by carbon taxes attracts inflow of private capital and tames intertemporal and interregional distortions

# Spending Side

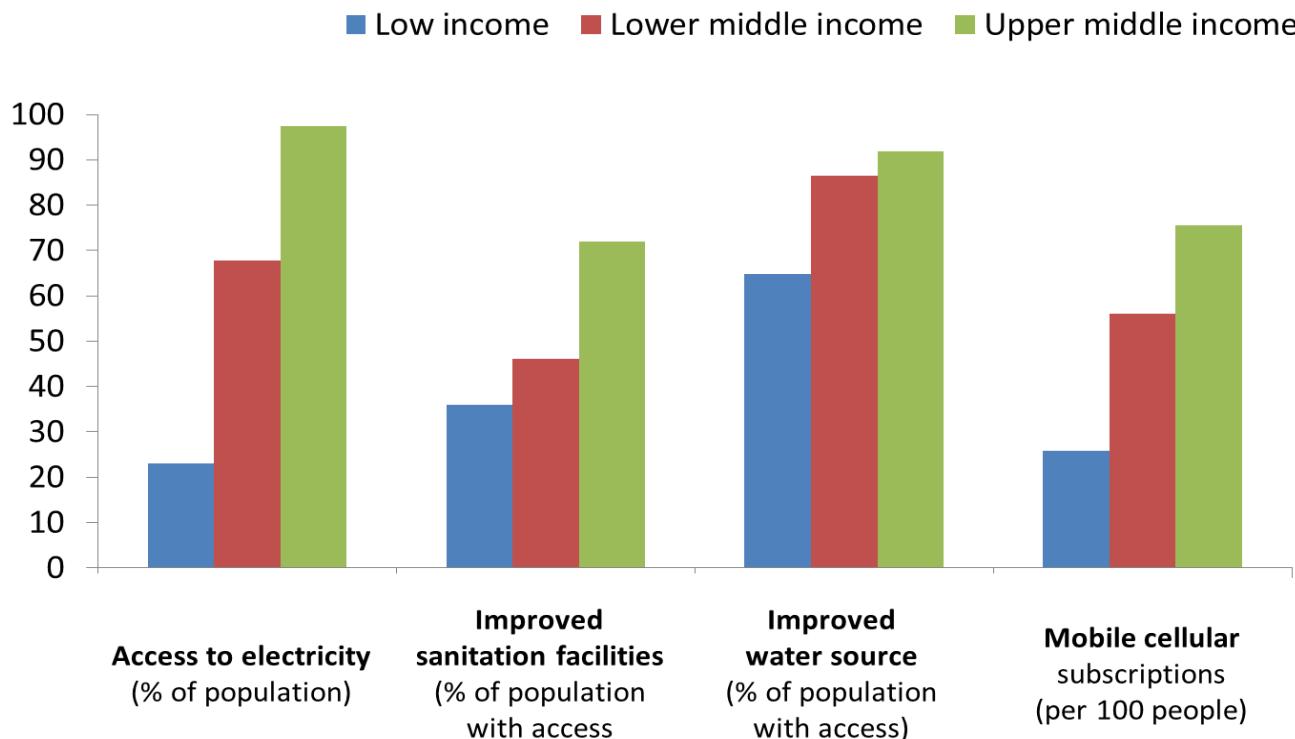


# Magnitude of the carbon rent



- Pricing carbon emissions would yield annual revenues of several hundred bln US\$
- Would also provide resources to address climate issues not tackled by a carbon price, e.g. technology policy and adaptation
- Could also contribute to address other issues, e.g. underprovision of public infrastructure

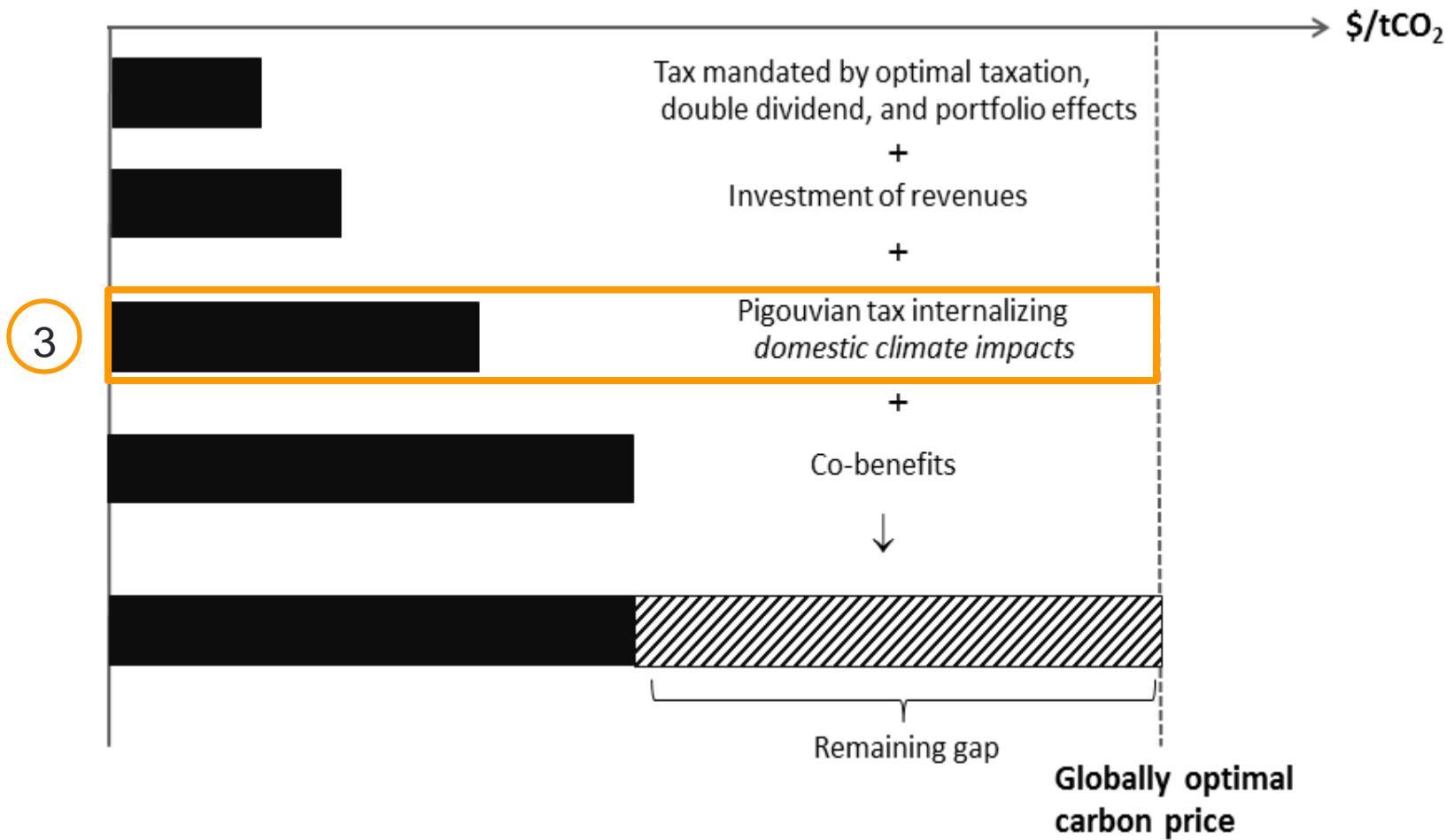
# Infrastructure Investments



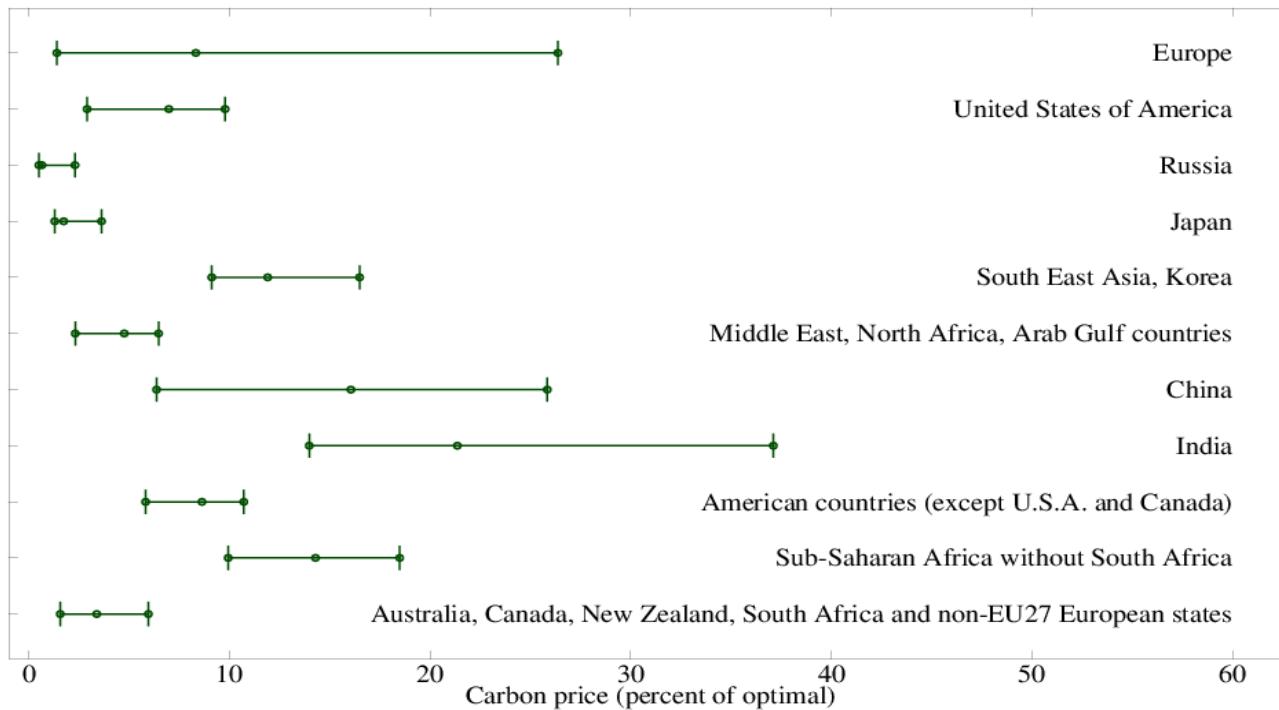
Jakob and Edenhofer, submitted

- Achieve universal energy access by 2030: US\$ 36-41 bln per year (Riahi et al. 2012)
- “Great convergence” of global health standards by 2035: about US\$ 40 bln per year (Jameson et al. 2013)

# Internalizing Domestic Climate Impacts

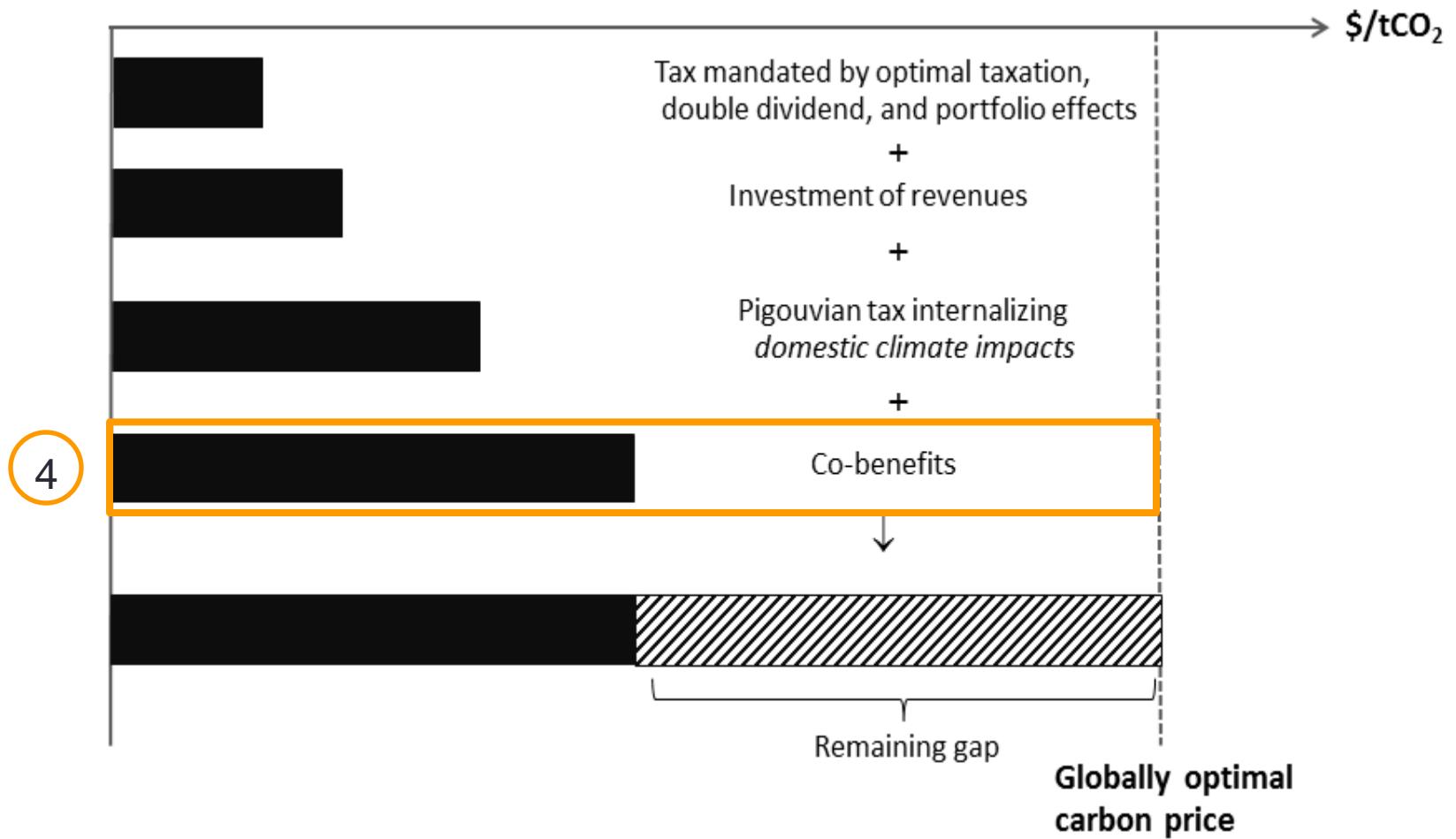


# Internalizing domestic impacts



- Even if countries behave in a purely selfish manner, they would optimally impose a price on carbon to **internalize the damage their emissions inflict on themselves**
- The resulting carbon price would be the higher the higher the damages, i.e. the richer or the more populous a country, up to 40% of globally optimal

# Co-Benefits

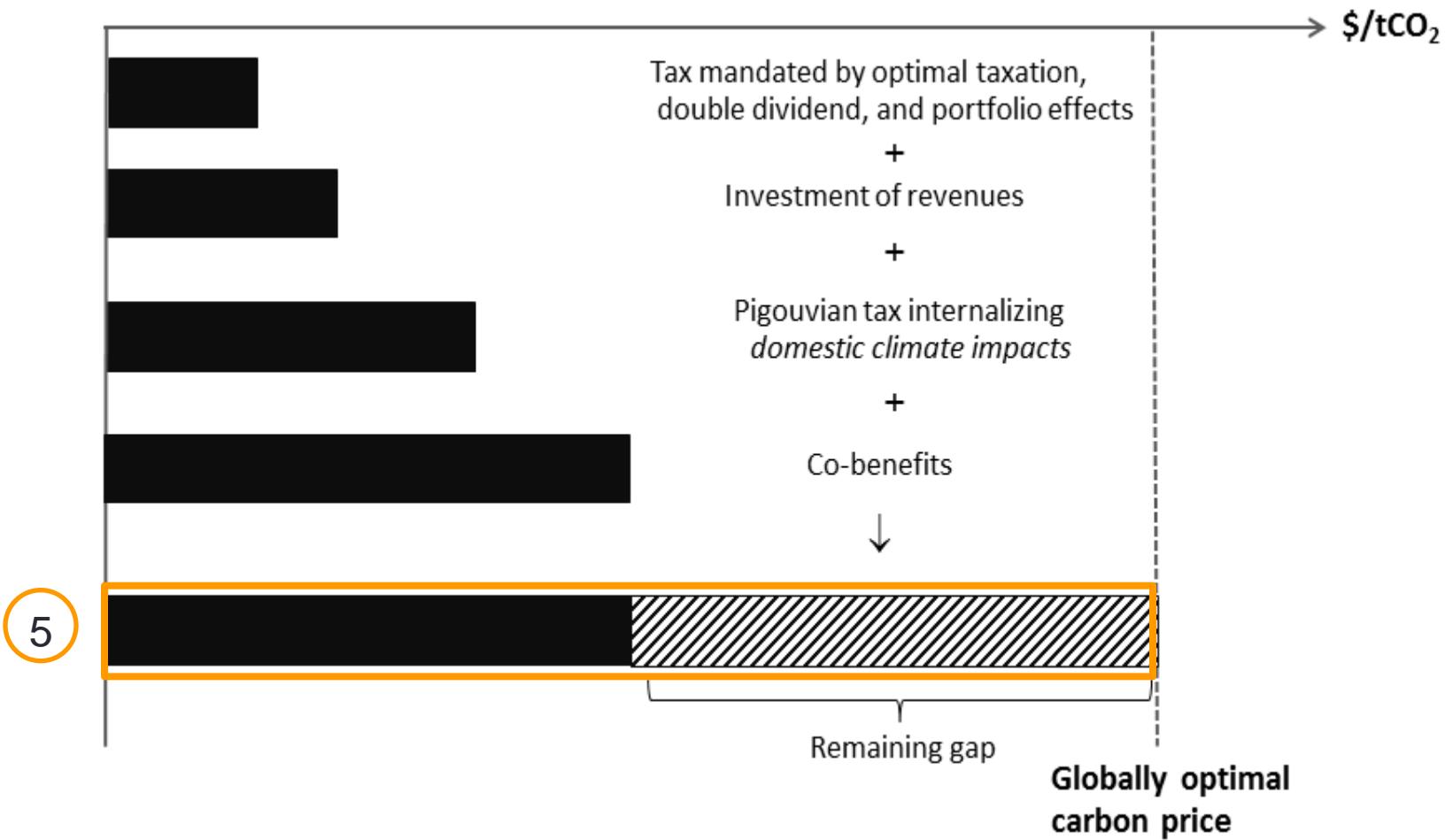


## Co-Benefits

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- Besides reducing GHG emissions, **several additional benefits**:
  - Ambient air quality (Nemet 2010)
  - Public transport, reduce congestion and urban sprawl (Creutzig and He 2008)
  - Technology spill-overs (Jaffe and Stavins 2005)
- Case study evidence suggests that for many countries these motivations were more important than environmental concerns for the adoption of climate policy, e.g.
  - India: Energy security (Dubash 2013)
  - Vietnam: Energy efficiency, economic restructuring (Zimmer, Jakob, Steckel, submitted)

# International Negotiations



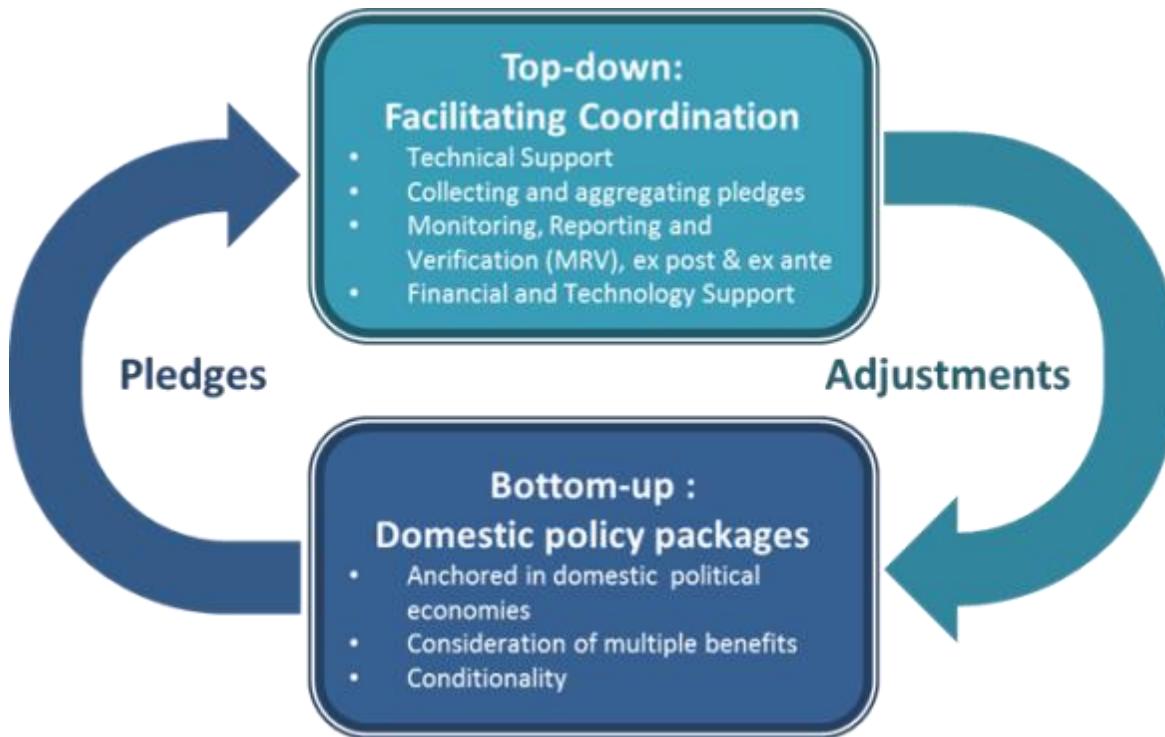
(Edenhofer et al. 2014)

## First movers and international negotiations

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- Moderate costs from a **period of moderate unilateral carbon pricing**, but delaying action by 15 years would raise costs of achieving 450ppm CO<sub>2</sub>-only by at least half (Jakob et al. 2012)
- Often argued that unilateral action is countered by free-riding (Barrett 1994, Carraro and Siniscalco 1993)
- Recent research has shown that first mover emission reductions can be **strategic complements instead of substitutes** (Edenhofer et al. 2013)
- **Carbon leakage** is a concern, however leakage rates moderate (Böhringer et al. (2012): 5-19%); also negative leakage possible (Carbone et al. 2013)
- Tailored policies can reduce leakage (Jakob et al. 2014)

# International Negotiation



- By iterative processes, unilateral actions might result in more global cooperation (Edenhofer, Flachsland, Stavins, Stowe 2013)
- Unilateral actions could form the basis of a hybrid agreement (Edenhofer et al. 2013)
- International agreement as institution to coordinate national policies, share information, and act as a focal point for expectations
- Conditionality could act as an incentive to increase ambition

## Conclusions

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- **Ambition of carbon pricing is rooted in domestic ambitions**
- **Domestic multi-Dividend perspective:**
  - Optimal taxation, double dividend, portfolio effects, taming capital tax competition
  - Investment of revenue in areas with highest social return
  - Reduction of CO<sub>2</sub> emissions mitigates climate change
  - Positive synergies with other issues such as air pollution and technology spill-overs
- **These considerations might not achieve globally optimal emission price, but help to close the gap and advance international negotiations**

# Contact

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