



University of
Zurich^{UZH}

Center for Comparative and International Studies (CIS)

Carbon pricing and innovation

Axel Michaelowa

axel.michaelowa@pw.uzh.ch

2nd Global Climate Policy Conference (GCPC)

New Delhi, May 1, 2015

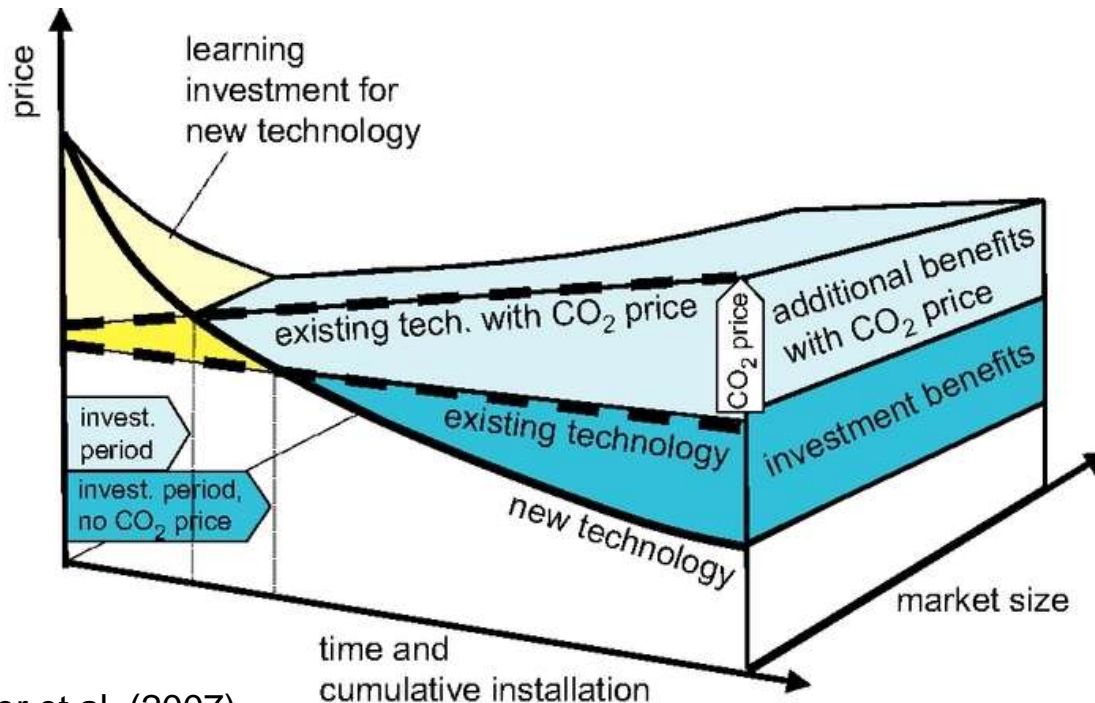




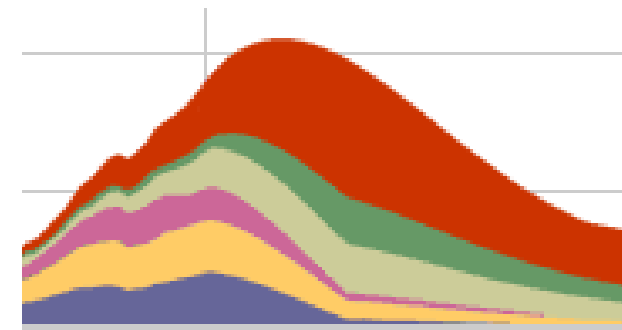
- **The grand design – global carbon pricing as driver of low-carbon technologies**
- **The hangover – is carbon pricing a failure with regards to innovation?**
- **Taking the pulse – which carbon pricing instrument has been most suited to promote innovation?**
- **Recommendations for policymakers to harness innovation benefits from carbon pricing**
- **Carbon pricing as “glue“ of a coalition of the willing**



- **Dynamic incentive** for firms to develop new technologies
- **Global emissions trading system vs emission tax**
- **1990s: global emissions trading system seen as “perfect solution”**: e.g. Contraction & Convergence
- **2010s: global carbon tax gaining support**



Barker et al. (2007)



2000
Global Commons Institute (1996)

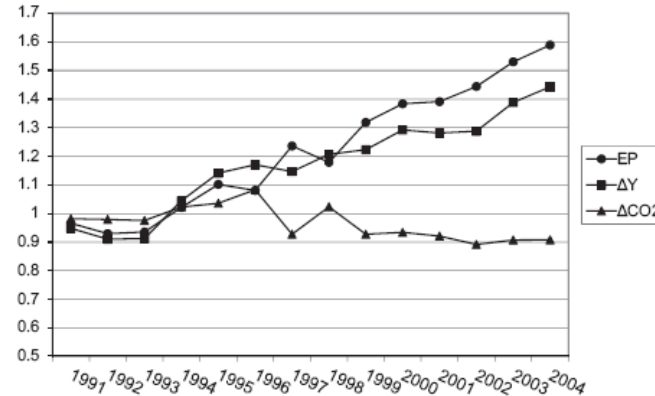


- **Theory:** Pure, **politically realistic** carbon pricing instruments are **unable to promote innovation**
 - Technologies in an **embryonic stage** will never be competitive with mature technologies at carbon prices that do not reach three-digit levels
 - Carbon price needs to be **differentiated** according to technology
- **Practice:** **Sobering** as carbon pricing systems are implemented
 - **Overallocation** of allowances in majority of ETS leads to price crash
 - **Price volatility** of allowances and offset credits
 - Political risk of **persistence of carbon pricing instruments** over time
 - Australia





Brännlund et al. (2014) for Sweden

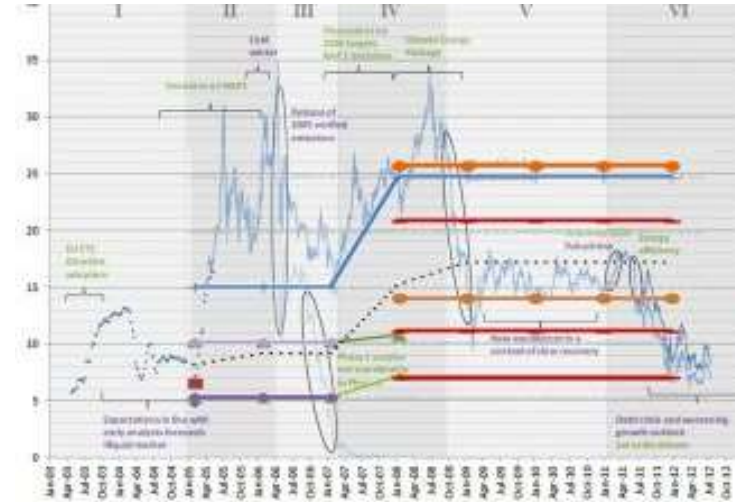


- **Carbon taxes**
 - **Emission reduction effect** empirically clearly proven
 - Most of the literature finds an **innovation effect**
- **Emission trading schemes**
 - EU ETS: innovation effect **rather limited** (survey on utilities)
 - **Price volatility** cited as reason
- **CDM**
 - **Unexpected** technology emerges: industrial gas projects
 - No researcher foresaw those projects
 - Significant **organisational** innovation

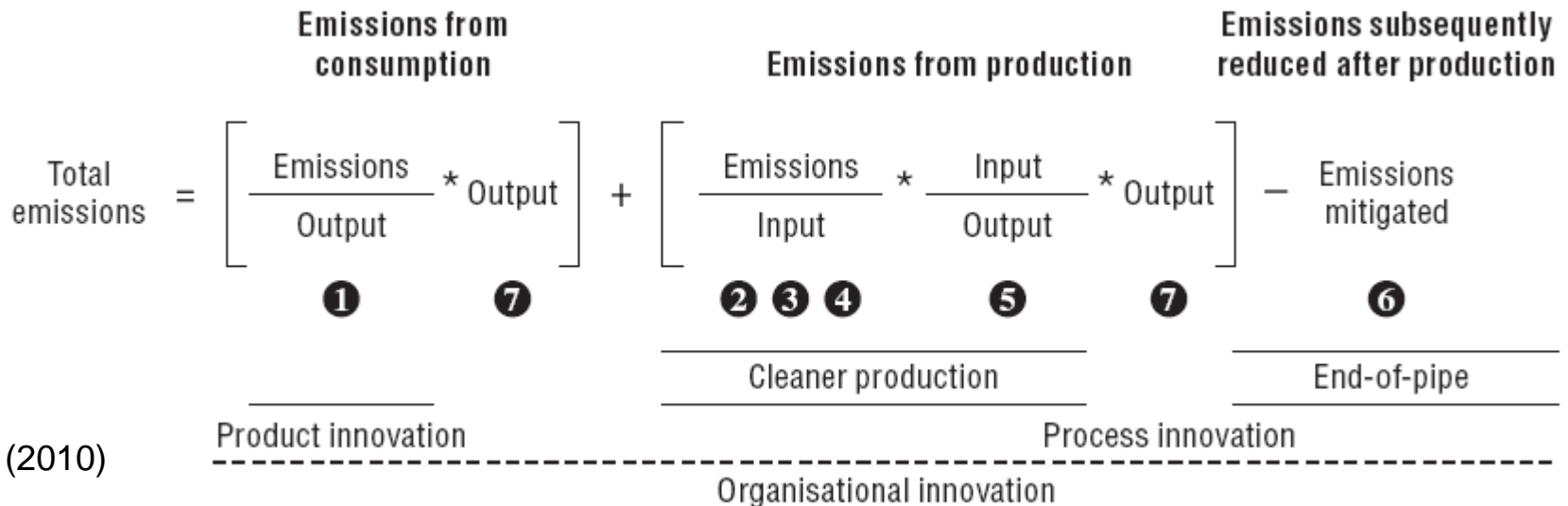




- Generate **trust** in persistence of pricing
 - Engage all political parties
- Guarantee **appropriability** of innovation benefits
- Use **revenues from carbon pricing to finance technology subsidies**
 - **Design of subsidy scheme is challenging**



Trotignon (2012)





- Carbon pricing provides the **revenue for innovation policies**
- **Tax** probably **better suited** than ETS when it comes to trust in the pricing level
 - Long-term increasing tax level
 - Avoid “**overallocation curse**”
 - Combination with **offset projects**
- Carbon pricing needs to be **shielded against competitors** for **trade-exposed industries**
 - Border-tax adjustment
- Carbon price level **not necessarily harmonized**
 - But harmonization would **facilitate BTA**

