

# Exploding the carbon price myth

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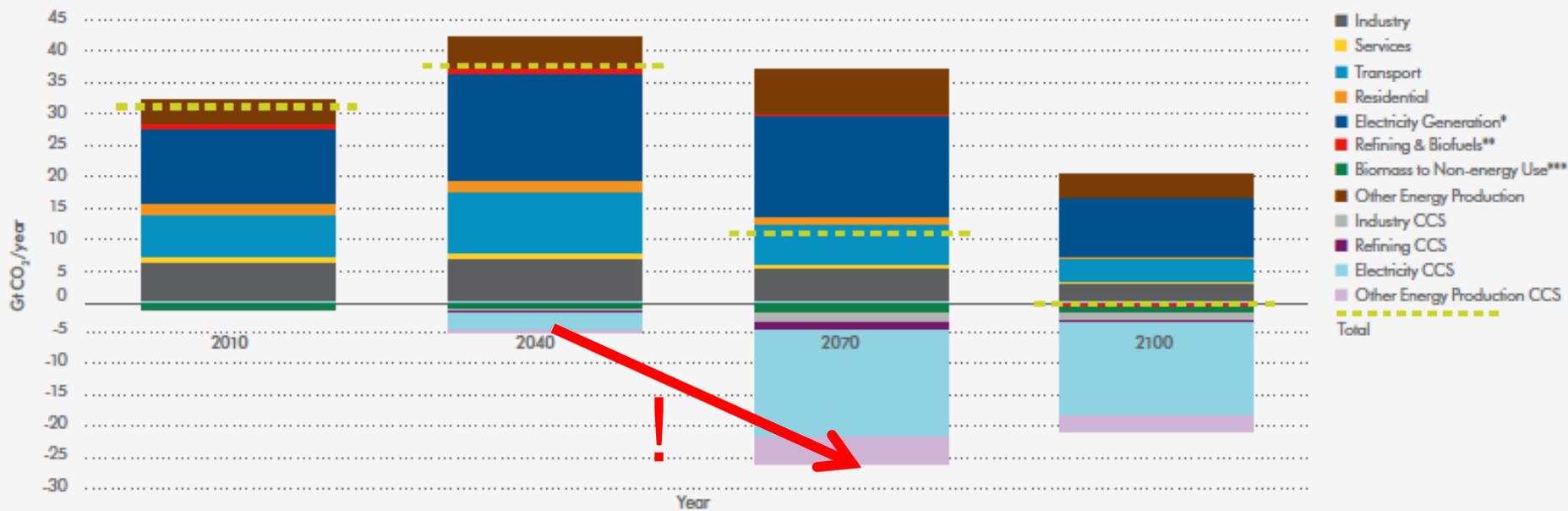
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# The evolution of CCS in a carbon-price-based scenario

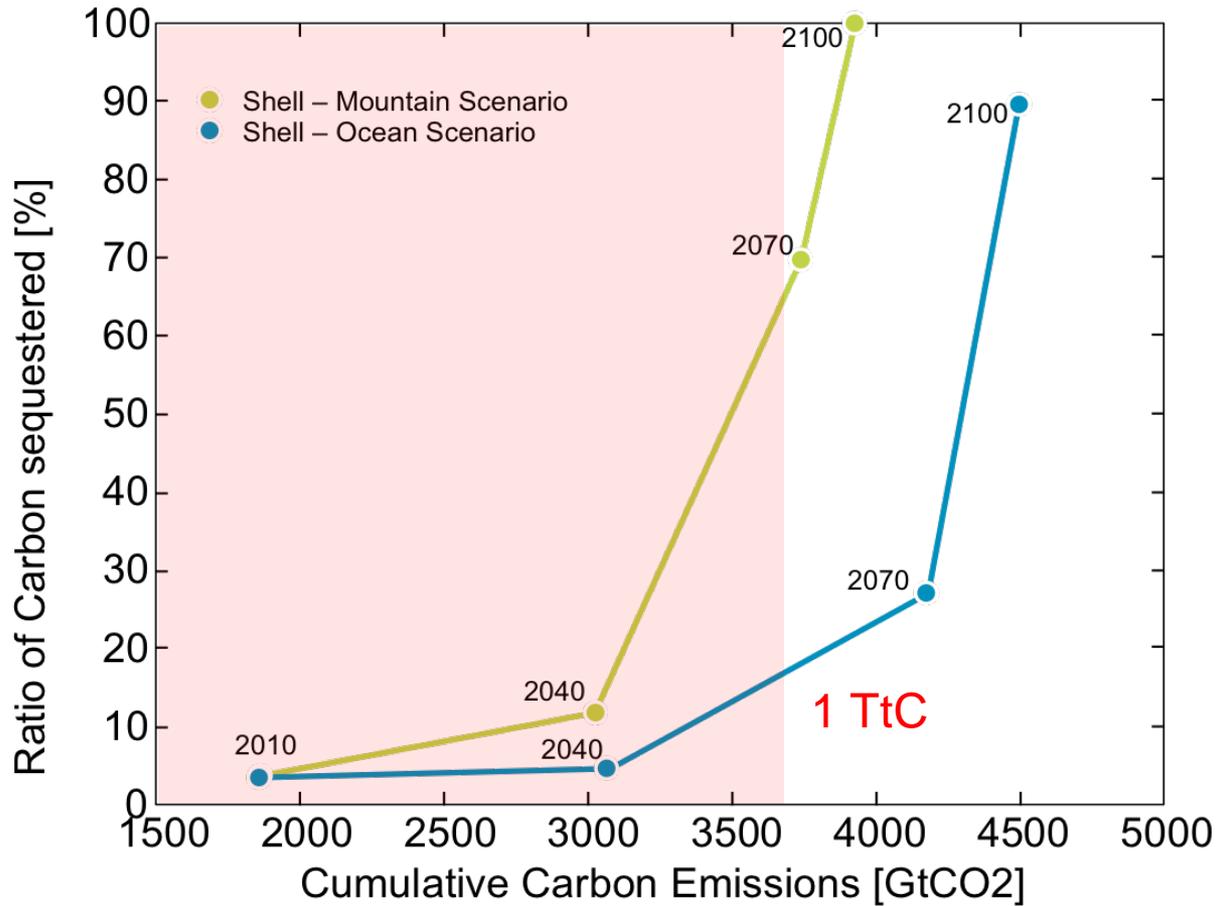
## CO<sub>2</sub> BY POINT OF EMISSION



\* Includes Biomass to Electricity which is, in combination with CCS, a 'carbon sink'.  
 \*\* Includes Biofuels, treated as 'carbon credit'. Emissions from liquids counted in Transport.  
 \*\*\* Commercial biomass, not competing with the food chain.

Shell "Mountains" scenario

# Sequestered fractions in Shell's "New Lens" scenarios



# How does Shell get from 10% sequestration to 70% sequestration in a couple of decades?

- “the application of CCS technology becomes embedded over the subsequent decades. This process is promoted by a policy mandate in which costs are passed on to consumers ... explicit carbon dioxide pricing remains patchy and at a low level overall.”
- So carbon pricing doesn't work: you don't get CCS except via a “policy mandate” – why not?

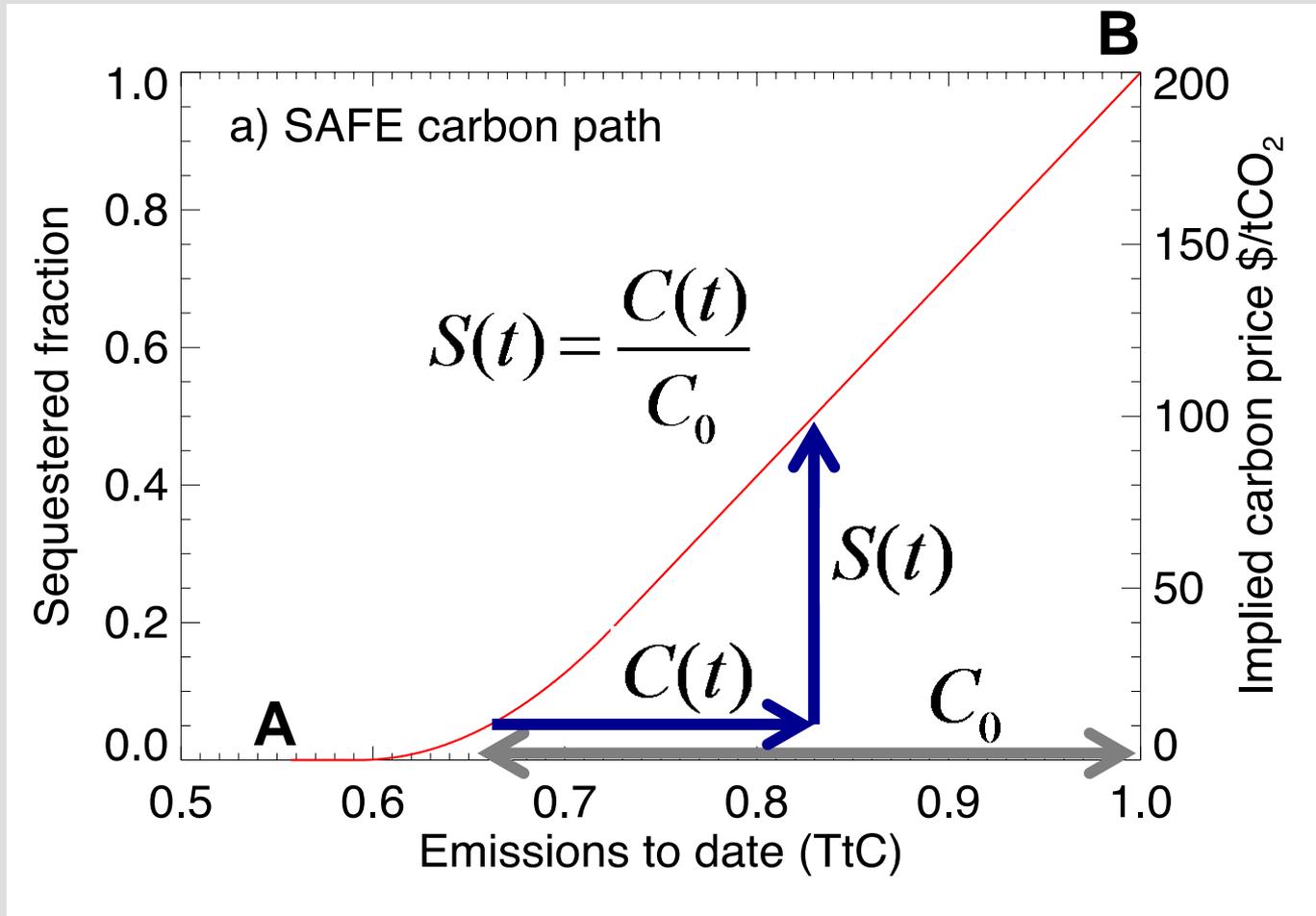
# Reasons why a carbon price does not help CCS

- **CCS costs are inelastic: no CCS at all until the carbon price exceeds the full cost. Hence convex shape of all sequestered fraction curves.**
- **Inter-temporal externality: heavy first-mover disadvantage in CCS projects.**
- **High capital cost – but also applies to renewables and nuclear, so not a specific problem for CCS.**
- **Limited scope for multi-decade banking of carbon price proceeds.**

# What happens if we rely on a carbon price?

- **Short-term: Some substitution, proceeds recycled, benefits in redistribution may outweigh costs.**
- **Long-term: investment in expensive mitigation options is postponed as late as possible, and then undertaken all at once.**
- **Real impact of mitigation on welfare is imposed on a future generation.**

# There is an alternative



# The softly-softly approach

- **Upstream mandatory sequestration would solve the climate problem:**
  - If CCS is expensive, by imposing a rapidly and predictably increasing implicit carbon price.
  - If CCS is cheap, by mandating large-scale deployment with minimal collateral economic damage.
- **But “everyone knows there is no single solution.”**
- **Alternate argument:**
  - We are likely to need CCS eventually (uniquely, meeting mitigation goals 30-300% more expensive without it).
  - Conventional price-based measures won't deliver it.
  - A low upstream mandate (e.g. 1% by 2020, currently 0.1%) would have a minimal impact on welfare, and transform options going forward.