PBL Netherlands Environmental Assessment Agency

# Cost effectiveness of EU ETS reform options


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# EU ETS

- in operation since 2005
- cornerstone of EU policy framework for climate & energy
  (with RED, EED, reduction targets for other sectors)
- power sector + energy-intensive industry + domestic aviation
- EU28 + EEA-EFTA
- ~45% total EU GHG emissions
- cap is reduced over time

# EU ETS reform - why?

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- Low demand…
  - economic stagnation
  - interacting policies (renewables)
  - international offsets (CDM & JI)
  - banking provision (surplus >2 billion allowances)
- … and fixed supply: **low price** and **large surplus**

But…

- even with low price emissions will not exceed the cap
- even with large surplus $CO_2$ price still >0

Insufficient incentive for long-term low-carbon investments

- low level of $CO_2$ price
- uncertainty about future $CO_2$ prices

# EU ETS reform - how?

How to make EU ETS more robust to external shocks?

- Economic literature:
  - floor price (+ price ceiling)
    - › auction reserve price
    - › fixed or variable tax
- European Commission
  - reduce supply of allowances (tighten cap, permanent set aside)
  - market stability reserve (adjustment of supply based on surplus)

# EU ETS reform - how?

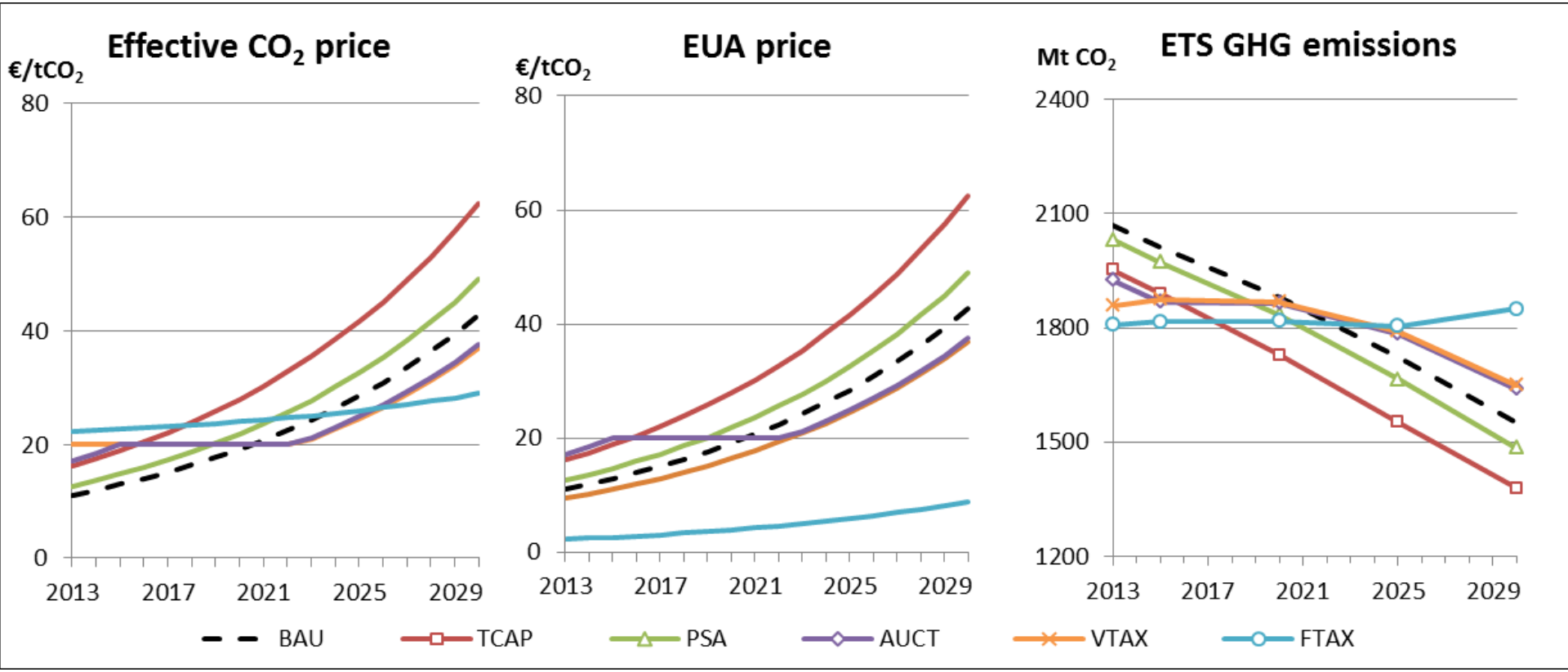
- Our analysis:
  1. tighter cap (-2.6 billion EUAs)
  2. permanent set aside (-900 mln EUAs)
  3. auction reserve price €20 – unsold EUAs into reserve
  4. variable $CO_2$ tax on top of EUA price (sum equal to €20)
  5. fixed €20 $CO_2$ tax on top of EUA price

# Method

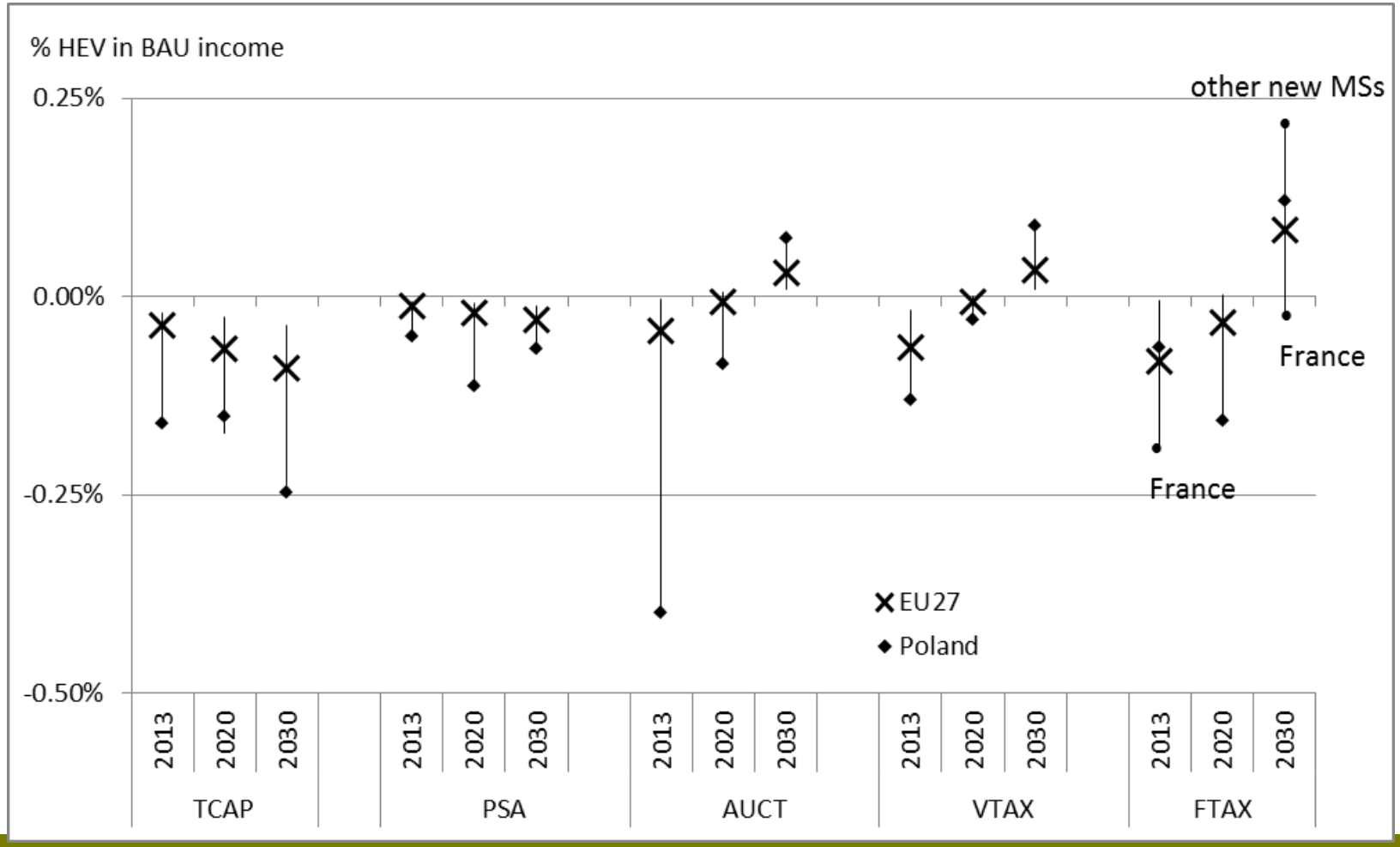
- WorldScan: Global multi-region multi-sector CGE model
  - detailed representation of EU ETS
    - › EU regions and ETS-sectors
    - › annual and regional supply and demand of allowances
    - › banking of EUAs
  - recursive dynamic model, but…
  - … forward-looking behavior on allowance market (banking => more abatement now, less in the future)

- Business-as-usual scenario:
  - EU ETS: current legislation extended to 2030
  - renewables policies + non-ETS targets
  - surplus of 2008-2012 and banking (time horizon 2030)

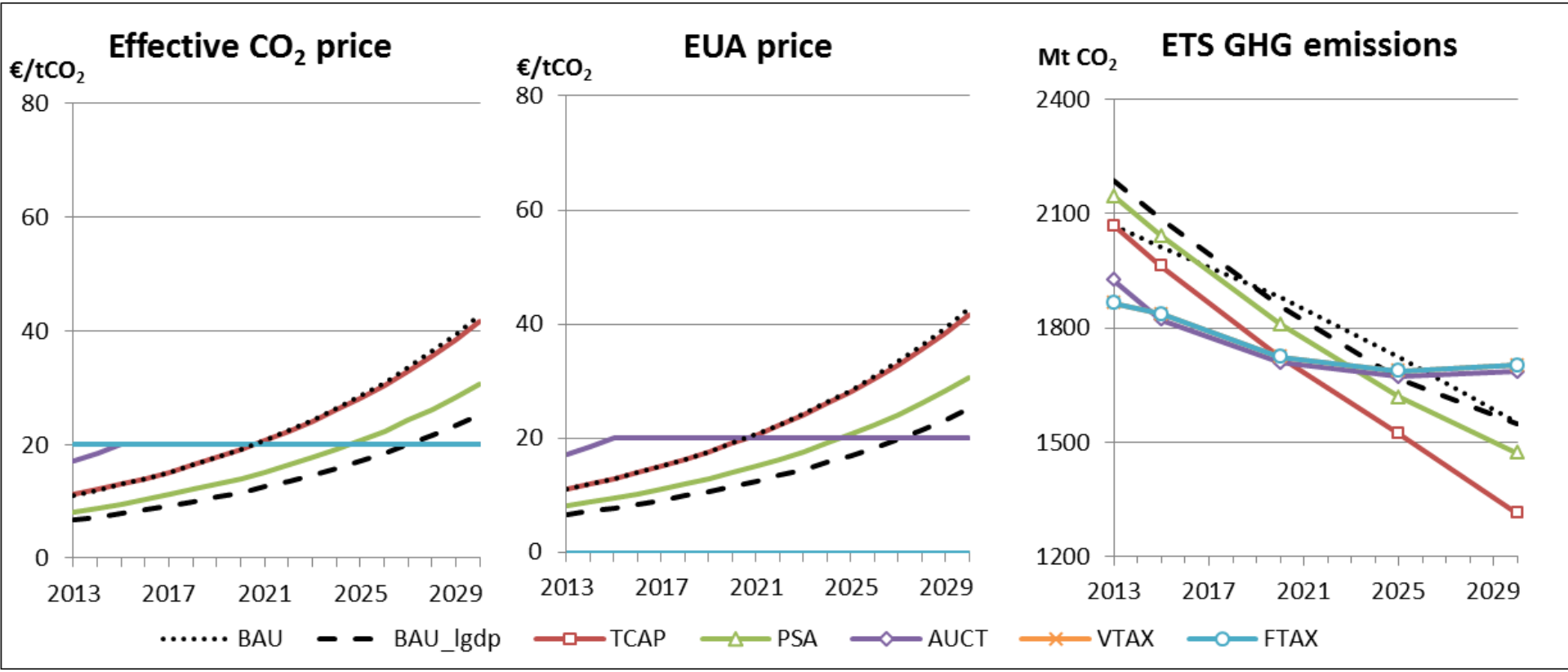
# Results


Effective $CO_2$ price
€/tCO2
80
60
40
20
0
2013
2017
2021
2025
2029
EUA price
€/tCO2
80
60
40
20
0
2013
2017
2021
2025
2029
ETS GHG emissions
Mt CO2
2400
2100
1800
1500
1200
2013
2017
2021
2025
2029
BAU
TCAP
PSA
AUCT
VTAX
FTAX

# Results – compliance cost



# Robustness check – low economic growth



# Conclusions

- Changing the cap does not make ETS robust to future shocks
  - new demand shocks would require new supply adjustments
- Auction reserve price and fixed or variable $CO_2$ tax introduce effective price floor
  - ETS more robust to future unexpected developments
  - more predictable prices will lower risk premiums on investments
  - sound scientific basis and included in other ETS (California, RGGI)
  - implementation may, however, be difficult:
    - › difficult negotiations on price floor level
    - › with auction reserve price widely divergent compliance cost (relatively large impact in new MSs)
    - › (fixed or variable) $CO_2$ tax requires unanimity among EU MSs