Economic Implications of Climate Policy: Insights from the EU Experience

Francesco Bosello, **Marinella Davide**, Isabella Alloisio
FEEM – Fondazione Eni Enrico Mattei

Why focus on European Union?

- Key player in the international climate policy arena
  → From Kyoto to Doha to Paris
- Consolidated climate change policy
  → 202020 package: emissions reduction and clean energy targets
  → ETS from 2005, now in Phase III,
  → Early national policies: ETRs in Northern European countries
- Offer a better understanding of the implications of different policy options for emerging economies and developing countries

Which kind of implications?

- Effect of EU mitigation policies on internal economic growth, competitiveness and carbon leakage
  → Mitigation can be anyway costly at the firm/sector and at the country level (higher costs and prices, lower production, more unemployment during transition)
- Distributional effects and energy poverty
  → effects on households, how the financial burden is shared, identify who actually bears the costs
  → focus on fuel poverty within the EU

Methodology

Wide number of empirical studies:

- Ex ante modelling studies: estimate the macro costs and competitiveness impacts at EU-wide/country/sectors
  - → 20% emission reduction target by 2020
  - → Carbon price in ETS sectors
- Ex post assessments: analysis of historical data on competitiveness and distributional effects
  - → consequences of environmental tax reforms (ETRs)
  - → assessment of the first phases of the EU ETS

Estimated macroeconomic costs

- Mitigation policies imply some welfare losses

  → most studies < 1% of GDP, overall range 0.04 – 2% in 2020

- Fragmentation of targets ETS/non ETS/RES seems to introduce some inefficiencies that drive up compliance costs by 50 – 125%

- An international emissions reduction action reduces costs for the EU or even led GDP gains (0.1%)

Estimated impacts on competitiveness

- More nuanced and differentiated findings at the sectoral/firm level
- Decarbonization effort induces a structural change that can affect costs and competitiveness of energy-intensive sectors
- A well designed ETS greatly reduces, and in some cases eliminates, adverse competitiveness effects
- Difficult to draw clear cut estimates for the carbon leakage effect (great variability of results, depending on methodologies and assumptions…)

Historical data: impact of green taxes

- Energy tax increases imposed by the ETRs causes overall unit production costs increase by 0.4%,with a resultant reduction in output of 0.1%
- The increase in stimulated demand-related innovation more than offset the costs (output increase +2.96%)
- ETRs lead to increasing fuel prices coupled with a reduction of fuel demand (4% on average) but revenue recycling may have a deflationary effect if used through reductions in employers' social security contributions

Historical data: impact of the EU ETS

- Non negligible impact on productivity and profits (up to 6%) for EU firms in pilot/initial phases but…
- no significant effect on company's added value, employment and profit margin in the phase I and beginning II
- ETS limited costs: free allocation and abundant credits availability in both phase I and II but not substantial innovation incentives
- Power sector able to pass through large part of its cost
- Little evidence of international relocation due to climate measures compared to other factors (e.g. market and global demand).

Distributional effect of mitigation policies

- General pattern in EU countries: energy/carbon taxes are overall mildly regressive

  → lower-income households bear a heavier burden as a share of income, due to higher prices for electricity

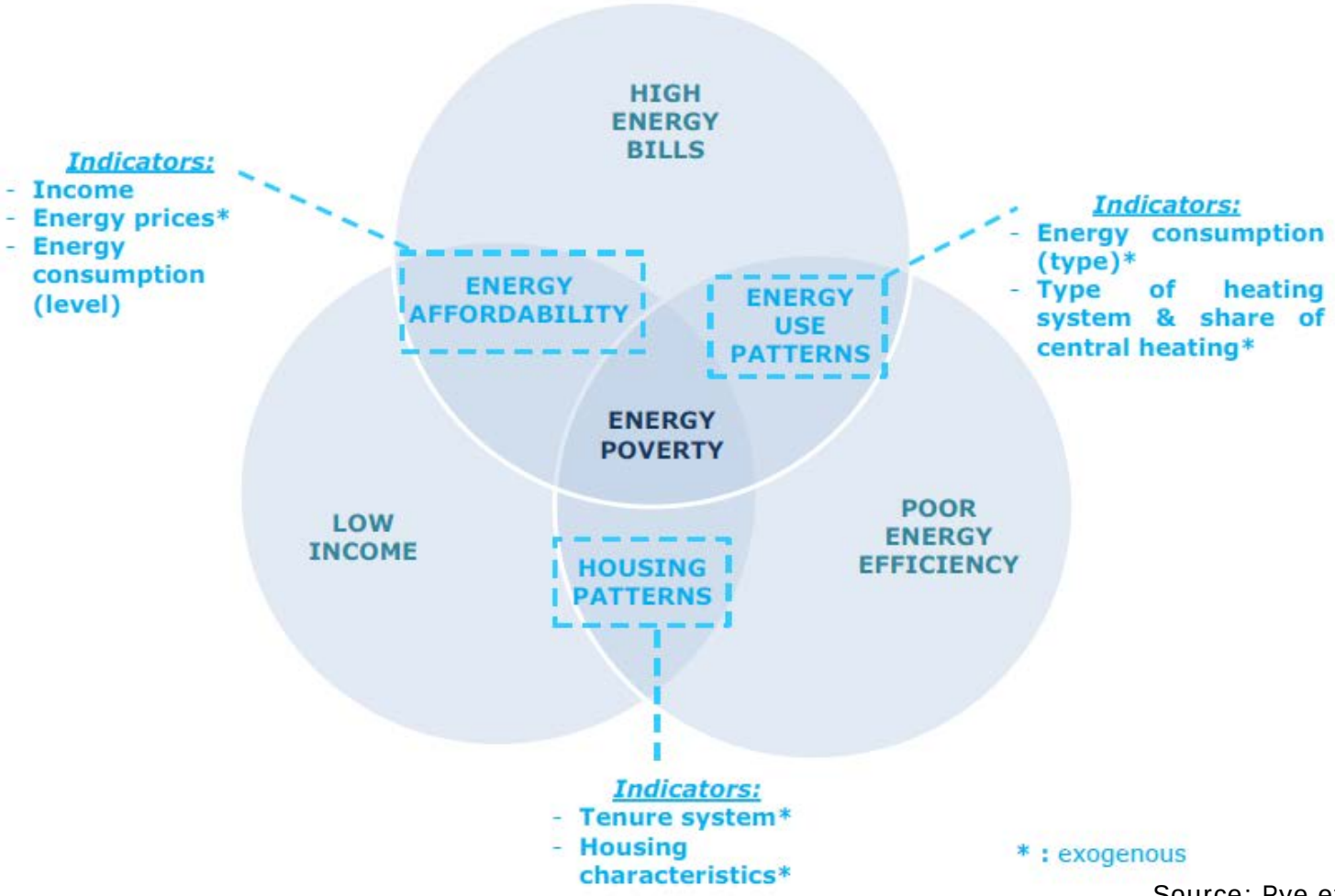
- Choice of the goods/services to tax has essential impact:

  → German Eco Tax Reform (1999): regressive effect for taxes on electricity and heating oil but not for motor fuel

- Revenue is one of the key drivers:

  → through labour taxation create a positive change in real incomes for all socio-economic groups but smaller benefit for those that do not pay income taxes (unemployed, retirees, etc.)

Energy poverty: drivers and key indicators



Source: Pye et al. 2015

How to measure it?

Share of population with dwellings with leakages and damp walls

Share of population with arrears in accounts

Share of population unable to keep comfortably cool

Share of the population unable to keep adequately warm

54 million EU citizens (**10.8**% of population) were unable to keep their home adequately warm in 2012 Similar numbers for the late payment of utility bills or presence of poor housing conditions

Sources: EU SILC 2012; Pye et al. 2015

Exploiting synergies?

- The EU as a whole does not address the issue directly, but growing concern about integration between environmental, economic and social objectives:
- Third Energy Package (2009) appropriate measures to address energy poverty, including development of national energy action plans
- Energy Efficiency Directive (2012) “to contribute […] to a reduction in fuel poverty in households”
  - Art. 7: allows MS to include requirements with social aims in their EEOs, e.g. prioritize households in energy poverty or social housing
  - Few MS included this requirement: Austria, France, Ireland and UK
- Lack of definition and instruments in southern/eastern EU: mainly aimed at social objectives, no explicit link with energy/fuel poverty

UK Fuel Poverty Strategy (2001)

- National target: eradicate fuel poverty by 2016
- 2.28 million of fuel poor, representing approximately 10.4 % of English households (DECC, 2014)
- Targets
  - Elderly people on low pensions: 700,000 individuals able to benefit from the rebate, directly deducted from the electricity bill
  - Vulnerable low-income households (other than the elderly).
- 2013 Reform following Professor Hills' review of Fuel Poverty strategy → Low Income High Costs
- New target (Dec. 2014): minimum standard of energy efficiency (Band C) for as many fuel poor homes as reasonably practicable by 2030.

Addressing fuel poverty in the UK

Two main actions:

- Compensation measures of vulnerable households from rising energy prices
  - Warm Home Discount Scheme: direct financial help to low-income groups to contribute to the payment of their electricity bills
  - Winter Fuel Payment: £100-300 tax free to help households with elderly people to pay energy bills and maintain warm homes during cold seasons
  - Cold Weather Payment: payment during periods of severely cold weather to pensioners or people on income-related benefits who meet certain criteria
- Improvement in the energy efficiency of dwellings
  - Warm Front scheme: £3,500 - £6,000 loans for low-income households at risk of energy poverty to improve insulation or repair heating system (ended in 2013)
  - Green Deal: package including an Energy Company Obligation (ECO) launched in 2013 to target higher cost measures and lower income households.

Conclusions

Difficult to derive a univocal lesson on the effect of EU climate policy on the EU economy:

- ✘ A (temporarily) reduction of productivity and employment by small amounts, esp. in energy-intensive sectors
- ✘ No compelling evidence in favor of Porter Hypothesis (but also low ambition of ETS)
- ✘ Non negligible effects on lower-income households
- ✓ Fairly robust evidence that the EU ETS has not hurt the competitiveness of firms and sectors (pass-through of EUA cost)
- ✓ Minor relocation effect of climate measures compared to other factors (e.g. market conditions and global demand developments)
- ✓ Revenue recycling and design features can offsets the costs