Jobs associated with technological change in the residential heating sector

Results from the EU heating decarbonisation scenario

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The study looks at impact of changes in the residential heating sector

- Many studies look at making homes more efficient through better insulations
- This will not eliminate fuel use by households completely
- To decarbonise residential heating, new heating system technologies are needed

Barriers to technological changes

1. **Slow turnover**
   - only 5% of stock need to be replaced within each year

2. **Diverse preference**
   - May not always prefer one technology even if it is made cheaper

3. **Inertia**
   - even if all households prefer new technologies, not all households would immediately adopt new technologies
     - lack of information
     - lack of access to finance
     - Industry constraints

Policy intervention is needed to encourage take up of new heating technologies
Tools used for the analysis

• Bottom up technologies model of residential heating (FTT-Heat) with a global macroeconomic model (E3ME)

• Both models are simulation models meaning
  – based on decision making rather than social planning (optimisation)
  – imperfect decision making due to lack of information and other barriers
  – decision makings can be affected by policies
  – learning by doing, costs come down over time and technologies are path dependent

• Detailed coverage and complete energy-environment-economy
  – 59 world regions, each with 69 sectors, 13 heating technologies
  – annual projections to 2050
  – all impacts are captured in one single framework
## Policies introduced to address new technologies barriers

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<td>Low-interest loan</td>
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Scenarios are based on policies mix

- **Scenario 1**: Share of renewables increase by +10pp until 2030
- **Scenario 2**: Deep decarbonisation by 2050
- **Scenario 3**: EU wide carbon tax

**Table 1**: Overview of scenarios 1-3 and simulated policies by group of Member States, from 2018-30 and 2030-50. Green indicates that a policy is implemented for a group of Member States in the given period, red indicates that a policy is not implemented.

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<th>Scenario</th>
<th>2018-2030</th>
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<td><strong>Member States:</strong></td>
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Using policies, we can decarbonise households heating

Scenario 2 shows 98% reduction in CO₂ emissions from residential heating
Macroeconomic impacts are small

• Overall, impact on GDP and employment are small

• Consumer expenditure falls
  – carbon tax reduces disposable income
  – higher spending on expensive heating appliances cause other spending to fall

• Boost to investment from higher electricity demand

• Reduction in fossil fuel imports
Households heating related expenditure

- Higher spending on carbon tax and appliances while the transition takes place
- In the long run, higher spending on electricity but will be compensated by savings on fossil fuels
Heating related jobs- there will be losers and winners

• Network energy supply (e.g. gas networks) jobs are at stake
• But it may well be different if the existing networks are used for the provision of renewable energy, such as biogas (which was not considered within this analysis)
Jobs impacts – minimising loss & promote opportunities

• Jobs impacts from heating decarbonisation would have been worse without using carbon tax revenues to lower other tax
  – example: use tax revenues to reduce employers’ social security contribution
• Retrained/repurpose fossil fuels-related jobs
• Carefully manage the transition for affected workers and communities
• Encourage domestic industry to become world leader in renewable heating providers
• Ensure necessary skills are available to support the transition
  – engineers, plumbers, etc
Further readings

- Our recent blog on the 2025 ban on gas and oil heating system

Key points to note:
- Gas will still be around for a long time, even with the ban, due to the long lifetime of existing systems.
- Displaced gas is replaced mainly with standard electric systems, i.e. panel and storage heaters. The share of heat pumps in the overall mix changes only slightly.
- The ban may discourage existing home owners from shifting to more efficient condensing gas boilers if they are gradually being phased out.
- The six-year lead time on the announcement is sensible. This gives companies the chance to become familiar with and develop new technologies to meet demand.
- The electricity grid in its present form would struggle to cope with such an outcome; more investment would be needed to cover peak-time demand.

Further readings (continue)

- Globally: simulating the deep decarbonisation of residential heating for limiting global warming to 1.5 °C

- Globally: decarbonisation in all sectors
  - [https://www.camecon.com/blog/estimate-global-value-stranded-fossil-fuel-assets/](https://www.camecon.com/blog/estimate-global-value-stranded-fossil-fuel-assets/)
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