Energy Poverty Measuring, Monitoring, and Identification: Socially Efficient Solutions to Meet Climate Policy Ambitions

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CEESEN 06.09.23
Optimised Measurement, Monitoring, and Identification: National Scale - Statistical Data, Local Scale - Administrative Data, keep Surveys for Experiments

**Data from statistical office**
- Low cost of acquiring
- Bullet-proof methods of data collection
- All regions and big cities
- Measuring and monitoring

**Administrative data**
- Cost of administrative labour
- Requires a research partner with good methods
- Street level data or 1 x 1 km grid
- Measuring, monitoring and identification

**Survey data**
- High costs (~3.5 EUR per respondent)
- Requires a research partner with good methods
- Municipality level
- Social preferences
Based on statistical data: combine multiple indicators to create a single, Multidimensional Energy Poverty Index

1.5 million (11%) households in energy poverty in Poland in 2021

Based on administrative data: combine multiple indicators to have identification of energy-poor households and prioritise support.

The more administrative data you have, the more precise your calculation will be.

Incomes
Energy bills
Building characteristics
Heating source characteristics
Number, age, gender, nationality of inhabitants

1 x 1 km grid of areas that require most immediate intervention

Source: CARE project (C40 and IBS)
Based on administrative data in Warsaw on incomes, heating sources and buildings, we map areas where interventions bring the most social and environmental benefits.
Use surveys to run experiments. From the respondents' choices you can learn what is their preferred policy solution for ETS-2 and Social Climate Fund.

We simulate behaviour scenarios and analyse their effects.

10281 people made mutually exclusive choices regarding:
- climate and environment,
- energy security,
- income gains and losses.

### GOALS OF ETS-2

<table>
<thead>
<tr>
<th>Goals</th>
<th>Scenario 1</th>
<th>Scenario 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate change impacts</td>
<td>Major</td>
<td>Minimal</td>
</tr>
<tr>
<td></td>
<td>A major decline in crops, a significant threat to life due to catastrophic heat, floods and droughts</td>
<td>No changes in crops, low risk to life from catastrophic heat, floods and droughts</td>
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<tr>
<td>Diseases caused by poor air quality</td>
<td>Limited to minimum</td>
<td>No change</td>
</tr>
<tr>
<td></td>
<td>less than 5,000 deaths annually</td>
<td>50,000 deaths annually</td>
</tr>
<tr>
<td>Purchases of Russian fuels</td>
<td>Limited to zero</td>
<td>Limited by half</td>
</tr>
<tr>
<td></td>
<td></td>
<td>imports of 5 billion m³ of gas and 16 million tons of oil annually</td>
</tr>
<tr>
<td>Access to electricity and individual transport</td>
<td>No change</td>
<td>Energy rationing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>no electricity every day for 1 hour and all Sundays of the year without a car</td>
</tr>
<tr>
<td>Policy options</td>
<td>No change</td>
<td>Carbon tax and full investment subsidy</td>
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### WAYS TO ACHIEVE IT

<table>
<thead>
<tr>
<th>Policy Option</th>
<th>Expected Impact</th>
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<tbody>
<tr>
<td>Tax on coal, gas and oil consumption at home and one-off, full co-financing of a heat pump, photovoltaic panels, insulation of a building or an electric car from the state budget</td>
<td></td>
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### IMPACT ON BUDGETS

<table>
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<tr>
<th>Net monthly income of your household</th>
<th>Monthly benefit/loss for your household</th>
</tr>
</thead>
<tbody>
<tr>
<td>5500</td>
<td>0</td>
</tr>
<tr>
<td>6160</td>
<td>+660</td>
</tr>
</tbody>
</table>
Based on survey experiments, look for socially efficient solutions: run experiments to learn the preferences of people in need of support.

We know an optimum amount of money and preferred support form to lower the aversion to carbon tax – crucial information for planning ETS-2 and Social Climate Fund redistribution.

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