ECONOMIC EFFECTS OF REFORMING ENERGY TAX EXEMPTIONS FOR THE INDUSTRY IN GERMANY

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1. Background
Background

► study “Approaches for further development of public finances” in Germany
  ➞ conducted by FÖS, Öko-Institute and GWS for the German Federal Environmental Agency between 2014 and 2016

► many exemptions from taxes and levies distort energy prices
  ➞ To prevent loss in international competitiveness (carbon leakage)

► practical and smart proposal for reform and harmonisation of current exemptions
  ➞ to eliminate or to sidestep existing perverse incentives

► macroeconomic impact analysis with PANTA RHEI
### Background

> Estimates of electricity volumes under present exemption regime benefiting from rebates (TWh, 2014)

<table>
<thead>
<tr>
<th>Category</th>
<th>Volume (TWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tax rebates</td>
<td>195</td>
</tr>
<tr>
<td>Tax capping ('Spitzenausgleich')</td>
<td>130</td>
</tr>
<tr>
<td>Reduced EEG-Levy</td>
<td>131</td>
</tr>
<tr>
<td>Reduced CHP-Levy</td>
<td>217</td>
</tr>
<tr>
<td>Reduced §19-Levy</td>
<td>67</td>
</tr>
<tr>
<td>Reduced Offshore Liability-Levy</td>
<td>156</td>
</tr>
<tr>
<td>Electricity price compensation</td>
<td>62</td>
</tr>
</tbody>
</table>

- **General rebates from electricity taxes**
- **'Tax capping' ('Spitzenausgleich')**
- **1-10 GWh: 10% of the EEG Levy**
- **EEG Levy: Above 100 GWh, 0.05 Ct/kWh**
- **CHP Levy: Category B**
- **§19 Levy: Category B**
- **Offshore Liability Levy: Category B**
- **Exemptions from particular processes and treatments**
- **EEG Levy: Own generation privileges**
- **10-100 GWh: 1% of the EEG Levy**
## Background

### Reform proposal: levels of rebate and requirements

<table>
<thead>
<tr>
<th></th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Hardship cases</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reduction of the Fees</strong></td>
<td>70-80 %</td>
<td>50-70 %</td>
<td>25-50 %</td>
<td>50 %</td>
</tr>
<tr>
<td><strong>Industry Sector Criteria A</strong></td>
<td>Primary sector traded on international commodity markets</td>
<td>-</td>
<td>-</td>
<td>Firms within the manufacturing sector</td>
</tr>
<tr>
<td></td>
<td>AND</td>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electricity price compensation list from EU-ETS</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Industry Sector Criteria B</strong></td>
<td>Trade intensity (Germany-rest of world) of the industry sector &gt; 30 %</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AND</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electricity intensity &gt; 0.8 MWh/€1,000 of gross value added (GVA)</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Firm Level Criteria C</strong></td>
<td>Electricity intensity &gt; 1.7 MWh/€1,000 of GVA</td>
<td>Electricity intensity &gt; 2.5 MWh/€1,000 GVA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Recycling of additional revenues: labor cost reduction and investment in energy efficiency
2. Methodology
Impact analysis

Scenario Design
definition of reform scenarios

Quantitative Detailed Analysis / Bottom-Up Analysis
impacts on electricity prices at industry 4-digit-level

Impulses in Monetary Terms
(i.e. electricity prices at industry 2-digit-level)

Evaluation of Macroeconomic Effects in Top-Down-Models
Model PANTA RHEI

- INFORGE + energy & environment
- Macroeconomic energy and environmental model
  - Based on official statistics (SNA, time series of IOT)
  - Bottom-up (63/73 sectors)
  - Fully interdependent
  - Energy balance systematic
  - Parameters econometrically derived from historical time series, no neoclassical general equilibrium

=> macroeconometric, not CGE

- Suitable for simulation of direct, indirect and induced effects
  ⇒ Net impacts

- Electricity prices for 4 user groups: Extended to different prices for 63 industries and pr. households in the project
Methodology: PANTA RHEI

- Methodology: PANTA RHEI
- Input-Output-Table, National Accounts
- Energy balance, satellite balance for renewable energy, energy prices
- Energy module
- Economic module
- Energy Policy Variables, Expert Information
3. Scenario design and results
Scenario design

- Effects on electricity prices (after reimbursement) in selected industries in the MIN- and MAX-scenario compared to the reference scenario, 2016 in Cent/kWh
Main drivers

► Electricity costs are redistributed between industries (and households)
► Higher tax revenues reduce labor cost and increase investment
► Impacts on industry level depend on (changes in)
  • Electricity cost
  • Labor cost
  • Export shares
  • Investment
  • International competition / price setting
  • Macro level
## Results

### Macroeconomic effects (2016)

<table>
<thead>
<tr>
<th>Components of GDP (price-adjusted)</th>
<th>MIN deviations in bill. €</th>
<th>MAX</th>
<th>MIN deviations in %</th>
<th>MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>5.13</td>
<td>0.82</td>
<td>0.18</td>
<td>0.03</td>
</tr>
<tr>
<td>Private consumption</td>
<td>2.13</td>
<td>1.62</td>
<td>0.14</td>
<td>0.10</td>
</tr>
<tr>
<td>Government consumption</td>
<td>0.10</td>
<td>0.09</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>Equipment</td>
<td>1.44</td>
<td>1.66</td>
<td>0.49</td>
<td>0.57</td>
</tr>
<tr>
<td>Construction</td>
<td>0.09</td>
<td>-0.06</td>
<td>0.03</td>
<td>-0.02</td>
</tr>
<tr>
<td>Exports</td>
<td>1.00</td>
<td>-1.76</td>
<td>0.07</td>
<td>-0.13</td>
</tr>
<tr>
<td>Imports</td>
<td>-0.38</td>
<td>0.65</td>
<td>-0.03</td>
<td>0.05</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Price indices (2010 = 100)</th>
<th>deviations</th>
<th>deviations in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private consumption</td>
<td>-0.06</td>
<td>-0.05</td>
</tr>
<tr>
<td>Production</td>
<td>-0.09</td>
<td>-0.08</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Labour market</th>
<th>deviations in 1,000</th>
<th>deviations in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment</td>
<td>18.05</td>
<td>0.04</td>
</tr>
</tbody>
</table>
Results

► Sector impacts

⇒ Real production, deviations in % and Bn. € (2016)
4. Conclusions
Conclusions

- Analysis is quite challenging due to heterogeneous electricity prices on industry level
  - Combination of detailed analysis on the 4-digit level
  - Translation into electricity prices on 2-digit level

- Other studies show negative economic impacts (and carbon leakage) of unilateral elimination of exemptions on energy taxes and levies

- Smart tax reform
  - some scope for reduction of tax exemptions
  - small positive economic and environmental effects
  - elimination of exemptions needs international coordination
Thank you for your attention.

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