ROBUST SOCIO-ECONOMIC ANALYSES OF ENERGY TRANSITION SCENARIOS:
A MACROECONOMIC ANALYSIS FED BY A PARTICIPATIVE APPROACH

IRENA MODELING FORUM

26/03/2020

Climate Change Service
Federal Public Service Health,
Food chain safety and Environment
PARTICIPATIVE SCENARIO BUILDING BASED ON CO-CONSTRUCTED ENERGY-ACCOUNTING MODEL

Originally based on UK 2050 calculator methodology (D. MacKay)

www.climatechange.be/2050
MUCH MORE CONTRASTING SCENARIOS THAN THOSE USUALLY PRODUCED BY TECHNICO-ECONOMIC MODELS

Limits of price-driven changes in economic modeling
Price-elasticities - Marginal changes - Non-market impacts - Static preferences - Co-benefits - …

A set of 5 scenarios reaching 80 to 95% GHG emission reduction

2 450 000 cars
77% flats
-50% animal proteins

Spatial planning, working arrangements, social innovation and networks, reducing meat consumption, …

CORE SCENARIO (-80%)
Overall feasibility, high ambition level but not technical maximum, …

TECHNOLOGY SCENARIO (-80%)
Role of technologies, risks and opportunities, R&D, …

INTEGRATION SCENARIO (-87%)

-95% GHG SCENARIO

4 800 000 cars
54% flats
No change in diets

Source: Belgium OPEERA model (Climact, VITO)
FEEDING A MACROECONOMETRIC MODEL OF THE BELGIAN ECONOMY

Average yearly costs 2010-50 (undiscounted, million EUR)

From ‘bottom-up’ energy accounting model

To ‘top-down’ macroeconometric model (HERMES)

CAPEX and OPEX

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSEHOLDS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIRMS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communications</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FUEL EXPENDITURES

Energy expenditures

(-)

From ‘bottom-up’ energy accounting model

To ‘top-down’ macroeconometric model (HERMES)

FEEDING A MACROECONOMETRIC MODEL OF THE BELGIAN ECONOMY

GDP and CO₂
(million € 2005 / million tons CO₂ in that year)

Jobs creation by economic sector in 2030
(Thousands of jobs in that year wrt Reference scenario)

<table>
<thead>
<tr>
<th>Economic Sector</th>
<th>Jobs Creation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>81</td>
</tr>
<tr>
<td>Manufacturing industry</td>
<td>11</td>
</tr>
<tr>
<td>Construction</td>
<td>27</td>
</tr>
<tr>
<td>Transports et communications</td>
<td>7</td>
</tr>
<tr>
<td>Other market services</td>
<td>40</td>
</tr>
<tr>
<td>Energy</td>
<td>-3</td>
</tr>
</tbody>
</table>

2030
THANK YOU!

References:
• [www.climatechange.be/2050](http://www.climatechange.be/2050)
• See also: [www.my2050.be](http://www.my2050.be)

[www.my2050.be](http://www.my2050.be)