Analysis of the integration of heat and electricity prosumers into the existing energy system with the focus on solar technologies

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CONTENT

• PROSEU project
• Case study
• Scenarios
• Results
• Determining what **incentive structures** will enable the **mainstreaming of RE prosumerism** and, in so doing, safeguarding citizen participation, inclusiveness and transparency in the **Energy Union**.
CASE STUDY

• Neighbourhood level case study – neighbourhood of Lanište in Zagreb

• 3214 inhabitants – 1202 households

• Heating demand 30 109 MWh

• Electricity demand 4 000 MWh
## SCENARIOS

- energyPRO modelling

<table>
<thead>
<tr>
<th></th>
<th>Reference scenario</th>
<th>Scenario 1</th>
<th>Scenario 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heat</strong></td>
<td>Individual gas boilers</td>
<td>Solar collectors</td>
<td>Solar collectors</td>
</tr>
<tr>
<td><strong>Electricity</strong></td>
<td>Grid</td>
<td>Grid</td>
<td>Grid</td>
</tr>
<tr>
<td><strong>District heating</strong></td>
<td></td>
<td>Photovoltaic panels</td>
<td>Photovoltaic panels</td>
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<tr>
<td><strong>Thermal storage</strong></td>
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</tbody>
</table>
RESULTS

• Scenario 1

Heat production
• Solar thermal 3.9 GWh
• DH 26.2 GWh (87%)
• **Scenario 2**

*Heat production*

• Solar thermal 12.4 GWh
• DH 17.7 GWh (59%)
• Scenario 1&2

Electricity load [MW]

10.1. 17.1.
• Scenario 1&2

Electricity load [MW]

30.6. 7.7.

Powered by

AALBORG UNIVERSITY DENMARK
UN environment
DISTRICT ENERGY IN CITIES INITIATIVE
4DH

Innovation Fund Denmark
452 MWh sold to the grid

- 2557.4 MWh (64%)
- 1442.6 MWh (36%)

Powered by:
- Aalborg University
- reINVEST
- sEEnergies
- Fonden Energi & Miljødata
- Innovation Fund Denmark
- 4DH
Economic indicators

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>Investment [HRK]</td>
<td>3 069 740</td>
<td>3 447 405</td>
<td>4 998 059</td>
</tr>
<tr>
<td>O&amp;M costs [HRK]</td>
<td>1 835 755</td>
<td>578 206</td>
<td>681 449</td>
</tr>
<tr>
<td>Cost of electricity [HRK]</td>
<td>3 096 271</td>
<td>1 757 903</td>
<td>1 757 903</td>
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<tr>
<td>Cost of natural gas [HRK]</td>
<td>9 467 389</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cost of heat from DH [HRK]</td>
<td>-</td>
<td>5 413 215</td>
<td>3 671 559</td>
</tr>
<tr>
<td>Income from PV panels [HRK]</td>
<td>-</td>
<td>176 319</td>
<td>176 319</td>
</tr>
<tr>
<td>Total annual costs [kn]</td>
<td>17 469 155</td>
<td>11 020 410</td>
<td>10 932 651</td>
</tr>
</tbody>
</table>
## Environmental indicators

<table>
<thead>
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<th>Scenario 2</th>
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</thead>
<tbody>
<tr>
<td><strong>Natural gas</strong></td>
<td>6835,14</td>
<td>-</td>
<td>-</td>
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<tr>
<td>[tCO₂]</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Electricity</strong></td>
<td>1504</td>
<td>961,58</td>
<td>961,58</td>
</tr>
<tr>
<td>[tCO₂]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DH [tCO₂]</strong></td>
<td>-</td>
<td>6718</td>
<td>4560,33</td>
</tr>
<tr>
<td><strong>Total [tCO₂]</strong></td>
<td>8339,14</td>
<td>7679,58</td>
<td>5521,91</td>
</tr>
</tbody>
</table>
Thank you for your attention!

PROSEU website: https://proseu.eu/

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