Poverty and Environmental Impacts of Electricity Price Reforms in Montenegro

prepared by Dragana Radevic
CEED, Montenegro
Starting point…

Regional energy treaty:

- Raising electricity tariffs
- Enforcing payments discipline
- Restructuring energy companies
- Establishing energy regulator
- Revising tariff methodologies
- Putting in place social safety nets to offset the adverse impact of tariff increases

Ex-ante analysis of the welfare impact of price increase on households in Montenegro
Methodology

- ISSP 2004 Household Survey
  - Overview of energy consumption patterns
  - Likely impacts of electricity tariff reforms on household welfare
- Welfare impact evaluation
- Benefit incidence analysis
- Estimating a fuel switching model by using multinominal logit model
Structure of the Presentation

- Context of energy sector reform in Montenegro and overview of energy consumption patterns
- The impact of electricity tariff reform on household welfare
- Social assistance options – comparison in the course of reforms
- The potential impact of energy price reform on household fuel choice
- Conclusions and policy recommendations

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Energy sector reform in Montenegro (1)

- Very low electricity tariffs in the past, inducing inefficient electricity consumption
- Large subsidies to utility company imposing heavy fiscal burden on the budget
- Increased energy intensity per unit of GDP due to low energy prices, declining GDP level and lack of financing to maintain and upgrade energy infrastructure
Energy sector reform in Montenegro (2)

Production and electricity consumption in Montenegro
1980-2006
Energy sector reform in Montenegro (3)

Production and energy consumption with assumed GDP growth rate of 6% in Montenegro, 2007-2020

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Focus on winter energy consumption: electricity and fuelwood

<table>
<thead>
<tr>
<th>Quintiles</th>
<th>Wood</th>
<th>Electricity</th>
<th>Total energy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>North</td>
<td>Center</td>
<td>South</td>
</tr>
<tr>
<td>1</td>
<td>5.9</td>
<td>5.5</td>
<td>0.5</td>
</tr>
<tr>
<td>2</td>
<td>5.3</td>
<td>3.9</td>
<td>1.1</td>
</tr>
<tr>
<td>3</td>
<td>4.4</td>
<td>3.3</td>
<td>0.6</td>
</tr>
<tr>
<td>4</td>
<td>3.9</td>
<td>2.1</td>
<td>0.4</td>
</tr>
<tr>
<td>5</td>
<td>2.8</td>
<td>1.1</td>
<td>1.0</td>
</tr>
<tr>
<td>ALL</td>
<td>4.9</td>
<td>3.8</td>
<td>0.7</td>
</tr>
</tbody>
</table>
Energy consumption patterns (2)

- Particularly vulnerable:
  - Poor households with disabled persons and on FMS
  - Household headed by unemployed or retired person

- Similar pattern compared to other European and central Asian countries
The impact of electricity tariff reform on household welfare

- Welfare loss calculated making different elasticity assumptions of household response to the proposed increase electricity price tariffs

<table>
<thead>
<tr>
<th>Elasticity</th>
<th>0</th>
<th>-0.5</th>
<th>-1</th>
<th>0</th>
<th>-0.5</th>
<th>-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Poorest)</td>
<td>3.41</td>
<td>3.04</td>
<td>2.66</td>
<td>4.96</td>
<td>4.41</td>
<td>3.86</td>
</tr>
<tr>
<td>2</td>
<td>2.35</td>
<td>2.09</td>
<td>1.83</td>
<td>3.24</td>
<td>2.88</td>
<td>2.52</td>
</tr>
<tr>
<td>3</td>
<td>2.31</td>
<td>2.05</td>
<td>1.79</td>
<td>2.97</td>
<td>2.64</td>
<td>2.31</td>
</tr>
<tr>
<td>4</td>
<td>1.99</td>
<td>1.77</td>
<td>1.55</td>
<td>2.48</td>
<td>2.21</td>
<td>1.93</td>
</tr>
<tr>
<td>5 (Richest)</td>
<td>1.68</td>
<td>1.50</td>
<td>1.31</td>
<td>1.86</td>
<td>1.66</td>
<td>1.45</td>
</tr>
<tr>
<td>ALL</td>
<td>2.39</td>
<td>2.13</td>
<td>1.86</td>
<td>2.84</td>
<td>2.52</td>
<td>2.21</td>
</tr>
</tbody>
</table>
Social assistance options – comparison in the course of reforms (1)

- Increasing Block Tariff (IBT) (same as the “lifeline tariff”)
- Volume Differentiated Tariff (VDT)
- “Social tariffs”
- Means-tested social assistance transfers
### Social assistance options – comparison in the course of reforms (2)

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Description</th>
<th>Average tariff</th>
<th>Lower tariff</th>
<th>Upper tariff</th>
<th>Threshold</th>
<th>Unfunded subsidy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>“Business as Usual Scenario” of no price increase while the cost-recovery price rises</td>
<td>4.85</td>
<td></td>
<td></td>
<td></td>
<td>32.6 million Euro/year</td>
</tr>
<tr>
<td>2</td>
<td>Increasing Block Tariff (IBT)</td>
<td>4.85</td>
<td>7.0</td>
<td>300</td>
<td></td>
<td>14.1 million Euro/year</td>
</tr>
<tr>
<td>3</td>
<td>Increasing Block Tariff (IBT)</td>
<td>4.85</td>
<td>8.6</td>
<td>300</td>
<td></td>
<td>None</td>
</tr>
<tr>
<td>4</td>
<td>Volume Differentiated Tariff (VDT)</td>
<td>4.85</td>
<td>7.5</td>
<td>500</td>
<td></td>
<td>None</td>
</tr>
<tr>
<td>5</td>
<td>A linear tariff increase to 7c€/kWh combined with a Targeted income transfer of 10 Euro/month to current FMS recipient households</td>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td>2.8 million Euro/year (cost of the FMS transfer)</td>
</tr>
</tbody>
</table>
Social assistance options – comparison in the course of reforms (3)
The potential impact of energy price reform on household fuel choice

- Multinominal logit model to investigate what factors determine household choice of a heating fuel
- Function of prices, income, household social and economic characteristics, and location where household lives

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Conclusions and policy recommendations (1)

- Increased electricity tariffs will have a very significant impact on the welfare of poor households.
- More than half of the population relies on fuelwood.
- Higher electricity prices could significantly increase the proportion of households using fuelwood for space heating to nearly two thirds of the population.
Conclusions and policy recommendations (2)

- Impact on the poor and impact on the environment
- Non linear tariffs schemes may be preferable but complicated to implement and limited by existing Law
- General social protection program
- Necessary to find some innovative ways to finance social assistance program for the poor and enhance energy efficiency in residential sector, in the same time.
CEED
Podgorica, Montenegro
Phone/fax: +382 81 620 611
Web site: www.visit-ceed.org
E-mail: ceed@cg.yu

Thank you!