BELARUS HEAT TARIFF REFORM AND SOCIAL IMPACT MITIGATION

February 2015
Contributors to the analysis

- Task Team Leader: Fan Zhang
- Fiscal analysis: Sebastian Eckardt
- Quantitative social impact and competitiveness analysis: Fan Zhang, Corbett Grainger, Bonsuk Koo
- Qualitative social impact and stakeholder analysis: Izabela Leao, Ecaterina Canter, Klavdiya Maksymenko
- Social protection analysis: Julia Smolyar, Vlad Alexandru Grigoras
- Energy efficiency analysis: Irina Voitekhovitch, Murat Alehodzhin
- Communication: Irina Oleinik, Heather Worley
Outline

- District heating sector in Belarus
- Background of the project
- Main findings and recommendations
  - Why is reform necessary
  - What are the impacts of tariff increases
  - How to implement the reform
DH sector at a glance
61% of the population and 81% of urban households in Belarus rely on district heating for heat supply.

<table>
<thead>
<tr>
<th>Heating Source</th>
<th>Overall</th>
<th>Urban</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>DH</td>
<td>61%</td>
<td>81%</td>
<td>14%</td>
</tr>
<tr>
<td>Individual gas boilers</td>
<td>15%</td>
<td>11%</td>
<td>23%</td>
</tr>
<tr>
<td>Individual stoves (coal, peat and firewood)</td>
<td>24%</td>
<td>8%</td>
<td>63%</td>
</tr>
</tbody>
</table>

Source: Belarus census data
The main providers of district heating (DH) services are:

- **Belenergo State Production Association (SPA)**
  - Belenergo is a vertically integrated, state-owned company which provides DH and electricity services in big cities of Belarus

- **ZhKHs**
  - ZhKHs are municipally owned housing authorities which provide a number of municipal services including DH
  - ZhKHs provide DH services in rural areas and smaller towns not covered by Belenergo

- Less than 1% of DH demand is met by small private district heating companies

Source: Belenergo, ZhKH
Historical heat production

- Natural gas (mostly imported from Russia) is used to produce the majority of DH generation
  - The DH sector consumed approximately 8 billion m³ of natural gas annually—40% of the country’s natural gas consumption.

Source: IEA.org, access January, 2014
Cost recovery has declined

Cost recovery for residential services

Source: Ministry of Economy, ZhKH, World Bank Staff estimation
Gas price increases and exchange rate devaluation have increased input costs.

Because of increasing input costs, the price of natural gas has also increased. The graph shows the trend of Belarus Border Prices (US$) and Natural Gas Import Price (000 BYR). The increase in prices is evident from 2007 to 2012, with a significant rise in 2011. The official exchange rate data is also presented, indicating the period average.

Source: World Bank DECPG
And decreasing real tariffs

Heat – ZnKH residential tariff
(2007 local currency)

Heat – Belenergo residential tariff
(2007 local currency)

Source: Ministry of Economy
Project Background

- Objectives
  - Support the Government of Belarus to formulate heat tariff reform strategies
  - Recommend measures to mitigate adverse social impacts of tariff increases on households (HHs)

- Joint Working Group
  - Belarusian Government
    - Representatives from ministries of Finance, Economy, Energy, Housing and Utilities, and Social Protection
  - World Bank Team
    - MFM, Poverty, Social Protection, Energy, Social Development, Communication
Main findings and recommendations: Complex reform with multiple impacts

<table>
<thead>
<tr>
<th></th>
<th>Why</th>
<th>What</th>
<th>How</th>
</tr>
</thead>
</table>
| Household     | - Subsidies benefit the rich by 13% more than the poor | - Household budget share on district heating could significantly increase | - Communication campaign  
- Consumer engagement  
- Improved social assistance programs  
- Demand-side energy efficiency investment |
| Sectoral      | - Cross-subsidies add costs to business and increase prices of consumer goods and services | - Removing cross-subsidies could reduce unit energy cost of manufacturing by 24% | - Improving existing social protection programs  
- Investing on energy efficiency |
| Fiscal        | - Fiscal and quasi-fiscal cost of underpriced heat has increased to US$1 billion in 2012 | - Fiscal savings range from 0.3 to 1.62% GDP | - Fiscal savings can be used to finance social assistance programs, energy efficiency investment, and/or reduce industrial energy prices |
A path towards a modern heat sector

2015
- 30% cost recovery
- Uniform price for Belenergo and ZhKH

2017
- Scenario 1: 60% cost recovery
  - Different price for Belenergo and ZhKH
- Scenario 2: 60% cost recovery
  - Uniform price for Belenergo and ZhKH
- Scenario 3: 45% cost recovery
  - Uniform price for Belenergo and ZhKH

2020
- Scenario 1: 100% cost recovery
  - Different price for Belenergo and ZhKH
- Scenario 2: 100% cost recovery
  - Uniform price for Belenergo and ZhKH
- Scenario 3: 60% cost recovery
  - Uniform price for Belenergo and ZhKH

- Demand-side EE fully scaled up
- Demand-side EE takes effect

2014
- Rolling out consumer communication campaign

2015
- Improved SP put in place
- Consumer monitoring mechanism established

2016
- Supply-side EE takes effect

2017
- 2018

2020
- 2019
- 2020

WORLD BANK GROUP
Why is reform necessary?
Subsidies are non-targeted and benefit the rich more than the poor

Source: Calculation based on HBS 2012 and data from Ministry of Economy
Also the fiscal and quasi-fiscal cost of subsidies has increased

- ZhKH accounts for about 40%; Belenergo for 60%

![Chart showing cross- and direct budgetary subsidies (% of GDP)](chart.png)

Source: Ministry of Energy, Ministry of Housing and Utilities, and World Bank staff calculation
Cross-subsidies add costs to business

- Industrial electricity prices are, on average, 150% of cost of service to subsidize underpriced residential heat

Source: Ministry of Economy
... and increase prices of consumer goods and services

- An implicit tax on industrial electricity use increases prices of key consumer products by 1-3%
- The tax burden on consumer products is modestly regressive

Source: Calculation based on HBS 2012 and Belarus input-output data 2009
What are the impacts of tariff increase?
Under uniform price regime the most affected are the urban poor who are connected to DH

Source: Simulation based on HBS 2012
Under differential price regime, rural poor who are connected to DH are more vulnerable

Source: Simulation based on HBS 2012
Impact will be the highest during Q1 and Q4

Share of average quarterly income on DH, bottom 40% HHs connected to DH

**Uniform Price, Urban HHs**

**Differentiated Price, Rural HHs**

Note: The number 1 below each graph refers to the HHs in the bottom 20% income quintile; the number 2 refers to the HHs in the 2nd income quintile; Q1-Q4 refers to quarter 1 – quarter 4.

Source: Simulation based on HBS 2012
Reducing expenditures on food and clothes is the most common coping strategy

- How did HHs cope with DH tariff increase
  - Reducing expenditure on other consumption, mainly food and clothes, is used as a main coping mechanism to deal with increased tariffs during winter months

- Perceived ability to control bills
  - Majority of the HHs connected to DH are unable to control their heating consumption
  - In case of overheating focus group discussion participants prefer to open windows rather than report to service providers, in order to avoid conflict with neighbors

Source: Focus Group Discussion, February-March 2014
The tariff increase will generate fiscal savings

- **Scenario 1:** 100% cost recovery in 2020, differentiated tariff
  - 2015: 0.25%
  - 2017: 0.51%
  - 2020: 0.98%
  - Total fiscal savings and the revenue of ZhKH and Belenergo would increase over time

- **Scenario 2:** 100% cost recovery in 2020, uniform tariff
  - 2015: 0.25%
  - 2017: 0.68%
  - 2020: 1.25%

- **Scenario 3:** 60% cost recovery in 2020, uniform tariff
  - 2015: 0.04%
  - 2017: 0.47%
  - 2020: 0.68%

The distribution of savings depends on the scenario
- Under scenario 1, Belenergo residential heat sales will become profitable

Source: World Bank Staff Estimation
Reducing cross-subsidies could improve industry competitiveness

- Average energy cost of manufacturing could be reduced by 24%

Reducing cross-subsidies could improve business competitiveness, especially for the wood, food, textile, and paper industries.

- Unit energy cost of wood, food, textile and paper industries would be reduced by between 25 to 28%, respectively.

How to implement tariff reform

Communication and consumer engagement
HHs perceptions on reform of DH tariffs

- **Perceptions on DH tariffs and service providers**
  - *Little knowledge* on how tariffs are determined and how bills are calculated

- **Attitudes towards increasing DH tariff**
  - *Low awareness* of tariff reform and the cross-subsidization system
    - Usually HHs learn about tariff increase only after receiving the bill
  - *Limited public support* and *understanding* of the rationale for tariff reform

*Source: Focus Group Discussion, February-March 2014*
Factors which would increase acceptance of DH tariff reform:

- **Corresponding increase of salaries and other benefits**, i.e. pensions and social assistance
- **Improved sector efficiency**
  - Adopting new technologies and modernizing equipment to reduce cost of heat supply
  - Enhancing clarity and transparency of heating bills to increase trust in service providers
- **Introduction of individual metering**

Source: Focus Group Discussion, February-March 2014
Implement strategic communication

- Develop a comprehensive communication strategy
  - Hold public forums to explain why a tariff increase is needed and how the amount is determined; encourage public discussion and debate on the proposed tariff reform.
  - Address consumers’ key concerns related to tariff increases, i.e., transparency and effectiveness in the heating sector.
  - Present tariff reform as a commitment to improve social economic welfare, for example, by increasing energy security and making utility services sustainable.
  - Explain the inefficiency of the current subsidy system which does not benefit those who need support the most.
  - Explain the social protection mechanisms and energy efficiency investment implemented to mitigate the negative social impact of tariff increases.
  - Prepare utilities and local authorities to communicate effectively with customers.

- Use consumers’ preferred channels of communication to convey information about utility services
  - These include utility bills, national and local mass-media, tenant meetings, hotlines, information boards, and internet.
  - The channels and messages should be selected to reach audiences of diversified age, gender, location, occupation, and income, as well as recipients of targeted social assistance.
31

How to Implement Tariff Reform

Improve Social Protection Mechanisms
Improve the social protection system

- Existing social assistance system is not sufficient to mitigate the impact of tariff increase on the poor
  - Existing social assistance benefits are categorical, skimpy, poorly targeted, with only 22% received by the poorest quintile
  - The only poverty-targeted benefits--GASP--have low coverage
    - Only 1.4% of total population covered
    - Short-term income support (6 months of the year)
    - Budget is 0.08% of GDP
Options for improving social protection system

1. Link the mitigation measures to the existing poverty-targeted cash transfers program:
   - expand GASP
   - top up GASP
     - Linked to energy payments and heating seasons

2. Re-introduce and refine the H&U subsidy benefit:
   - “old” program that existed until 2010
   - refined “new” benefit
     - Progressive income-related thresholds
       - HHs from the 1st, 2nd and 3rd decile to be compensated for the expense above 10%, 15%, and 20% of their income, respectively

3. Level pay plan
   - Allow customers to average annual energy costs over a 12-month period.
## Comparison of SP: performance and budget

<table>
<thead>
<tr>
<th></th>
<th>Benefit coverage</th>
<th>Targeting accuracy</th>
<th>Budget per year, % GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expand GASP (20% of population)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st decile</td>
<td>52</td>
<td>51</td>
<td>42</td>
</tr>
<tr>
<td>2nd decile</td>
<td>48</td>
<td>52</td>
<td>21</td>
</tr>
<tr>
<td>3rd – 10th deciles</td>
<td>12</td>
<td>12</td>
<td>37</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td><strong>Expand GASP (10% of population) + Top up GASP (10% of population)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st decile</td>
<td>100</td>
<td>100</td>
<td>59</td>
</tr>
<tr>
<td>2nd decile</td>
<td>81</td>
<td>83</td>
<td>20</td>
</tr>
<tr>
<td>3rd – 10th deciles</td>
<td>2</td>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td><strong>Old H&amp;U benefit</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st decile</td>
<td>5</td>
<td>21</td>
<td>48</td>
</tr>
<tr>
<td>2nd decile</td>
<td>1</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>3rd – 10th deciles</td>
<td>1</td>
<td>5</td>
<td>37</td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
<td>7</td>
<td>100</td>
</tr>
<tr>
<td><strong>Refined H&amp;U benefit</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st decile</td>
<td>27</td>
<td>61</td>
<td>84</td>
</tr>
<tr>
<td>2nd decile</td>
<td>3</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>3rd – 10th deciles</td>
<td>0</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: World Bank staff estimation based on HBS2012
## Comparison of SP: poverty impact

<table>
<thead>
<tr>
<th>National poverty line</th>
<th>Total population</th>
<th>1st decile</th>
<th>2nd decile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before transfers</td>
<td>1.8</td>
<td>4.3</td>
<td>18.2</td>
</tr>
<tr>
<td>Expand GASP</td>
<td>0.9</td>
<td>2.1</td>
<td>8.6</td>
</tr>
<tr>
<td>Top up GASP</td>
<td>0.8</td>
<td>1.6</td>
<td>8.02</td>
</tr>
<tr>
<td>Old H&amp;U benefit</td>
<td>1.8</td>
<td>4.1</td>
<td>18.1</td>
</tr>
<tr>
<td>Refined H&amp;U benefit</td>
<td>1.8</td>
<td>3.9</td>
<td>17.5</td>
</tr>
</tbody>
</table>

| H&U poverty rate      | Total population | 1st decile | 2nd decile |
| Before transfers      | 1.1             | 5.9        | 5.3        | 18.9       | 1.4        | 7.7        |
| Expand GASP           | 0.8             | 4.1        | 3.1        | 8.3        | 0.9        | 3.8        |
| Top up GASP           | 0.5             | 3.5        | 0.8        | 2.5        | 0.6        | 1.9        |
| Old H&U benefit       | 1.0             | 4.9        | 4.9        | 16.0       | 1.4        | 6.1        |
| Refined H&U benefit   | 0.5             | 3.5        | 0.7        | 1.3        | 0.5        | 3.9        |

Source: World Bank staff estimation based on HBS 2012

Note: National poverty line in November 2012: BYR 880,030 per capita per month.; Welfare indicator: Total income per capita
How to Implement Tariff Reform

Energy Efficiency Measures
Supply-side energy savings measures

- Replace low efficiency boilers with modern ones
- Converting from natural gas boilers to boilers using domestic renewable fuels
- Replace steam with hot water boilers
- Replace network parts that have high losses with pre-insulated pipes
- Reduction of the network dimension and optimization of the network routes

Source: Case studies of three DH systems: Baranovichi, Volkovysk, Starye Dorogi
Economic assessment of supply-side EE measures

- Feasibility and pay-back time of supply-side EE measures usually depend on the details and parameters of DH system
- Typical EE measures in case study towns are presented below

<table>
<thead>
<tr>
<th>Measure Description</th>
<th>Investment cost (000 USD)</th>
<th>Reduction of gas use (000 m³)</th>
<th>Economic rate of return</th>
<th>Net present value (US$ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replacement of base load NG boilers</td>
<td>522</td>
<td>569</td>
<td>49%</td>
<td>1</td>
</tr>
<tr>
<td>Replacement of peak load NG boilers</td>
<td>522</td>
<td>119</td>
<td>4%</td>
<td>-0.17</td>
</tr>
<tr>
<td>Replacement of base load NG boilers with wood biomass boilers</td>
<td>8.5</td>
<td>5,303</td>
<td>13%</td>
<td>1.49</td>
</tr>
</tbody>
</table>

Source: Case studies of three DH systems: Baranovichi, Volkovysk, Starye Dorogi
Economic assessment of supply-side EE measures

- Feasibility and pay-back time of supply-side EE measures usually depend on the details and parameters of DH system
- Typical EE measures in case study towns are presented below

<table>
<thead>
<tr>
<th>Replacement of base load NG boilers</th>
<th>Investment cost (000 USD)</th>
<th>Reduction of gas use (000 m3)</th>
<th>Economic rate of return</th>
<th>Net present value (US$ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replacement of peak load NG boilers</td>
<td>522</td>
<td>119</td>
<td>4%</td>
<td>-0.17</td>
</tr>
<tr>
<td>Replacement of base load NG boilers with wood biomass boilers</td>
<td>8.5</td>
<td>5,303</td>
<td>13%</td>
<td>1.49</td>
</tr>
</tbody>
</table>

Source: Case studies of three DH systems: Baranovichi, Volkovysk, Starye Dorogi
Suggested demand-side EE measures are targeted at saving heat in existing buildings:

- Window replacement (double or triple panel glass windows)
- Insulation of external walls
- Roof insulation
- Installation of thermostatic valves in flats (apartment-level heat metering)
- Installation of house level heat substation (ITP) (building-level heat metering)

**Costs and energy saving potential (overall building space heating consumption):**

<table>
<thead>
<tr>
<th>EE measure</th>
<th>Unit</th>
<th>Unit cost (USD)</th>
<th>Potential energy saving (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Window replacement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Double pane windows</td>
<td>m2</td>
<td>100</td>
<td>18%</td>
</tr>
<tr>
<td>Triple pane windows</td>
<td>m2</td>
<td>150</td>
<td>26%</td>
</tr>
<tr>
<td>External wall</td>
<td>m2</td>
<td>65</td>
<td>30%</td>
</tr>
<tr>
<td>Roof insulation</td>
<td>m2</td>
<td>30</td>
<td>6%</td>
</tr>
<tr>
<td>Radiator thermostatic valves</td>
<td>piece</td>
<td>40</td>
<td>5%</td>
</tr>
<tr>
<td>House level heat substation (ITP)</td>
<td>piece</td>
<td>15,000</td>
<td>15%</td>
</tr>
</tbody>
</table>

Source: World Bank Staff Estimation based on energy audits in case study towns
Economic assessment of demand-side EE measures under current tariff levels

- Suggested EE measures are not economically feasible under current tariff levels
- Wall and roof insulation investments have longest paybacks; IRRs < discount rate

<table>
<thead>
<tr>
<th>EE measures</th>
<th>Investment (whole building) (USD)</th>
<th>Simple payback (years)</th>
<th>EIRR (%)</th>
<th>NPV (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Window replacement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Double pane windows</td>
<td>62 480</td>
<td>70.5</td>
<td>10.6</td>
<td>49 253</td>
</tr>
<tr>
<td>Triple pane windows</td>
<td>93 720</td>
<td>73.2</td>
<td>10.8</td>
<td>74 298</td>
</tr>
<tr>
<td>External wall</td>
<td>157 625</td>
<td>106.7</td>
<td>13.3</td>
<td>130 717</td>
</tr>
<tr>
<td>Roof insulation</td>
<td>31 170</td>
<td>105.5</td>
<td>13.2</td>
<td>25 821</td>
</tr>
<tr>
<td>Radiator thermostatic valves</td>
<td>7 176</td>
<td>29.1</td>
<td>3.7</td>
<td>-4 427</td>
</tr>
<tr>
<td>House level heat substation (ITP)</td>
<td>15 000</td>
<td>20.3</td>
<td>0.2</td>
<td>-7 347</td>
</tr>
<tr>
<td>Total Investment</td>
<td>367 171</td>
<td>75.4</td>
<td>-11</td>
<td>242 610</td>
</tr>
</tbody>
</table>

Source: World Bank Staff Estimation based on energy audits in case study towns
EE impact on HHs energy costs

- Supply-side EE will result in 9% reduction of the energy costs of an average HH
- Implementation of both supply and demand-side EE measures could reduce energy cost for an average HH by 41-46%

<table>
<thead>
<tr>
<th></th>
<th>Before EE Measures</th>
<th>After Supply-side EE Measures</th>
<th>After supply and demand-side EE Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat consumption of an</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>average HH Gcal/y</td>
<td>9.2</td>
<td>9.2</td>
<td>9.2</td>
</tr>
<tr>
<td>Heating cost of an</td>
<td>USD</td>
<td>Scenario 1 (Belenergo)</td>
<td>156</td>
</tr>
<tr>
<td>average HH USD</td>
<td></td>
<td>Scenario 1 (ZhKH)</td>
<td>156</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scenario 2</td>
<td>156</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scenario 3</td>
<td>156</td>
</tr>
<tr>
<td>Reduction of heating</td>
<td>%</td>
<td>Scenario 1 (Belenergo)</td>
<td></td>
</tr>
<tr>
<td>cost of an average HH</td>
<td></td>
<td>Scenario 1 (ZhKH)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scenario 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scenario 3</td>
<td></td>
</tr>
</tbody>
</table>

Source: World Bank Staff Estimation based on energy audits in case study towns
EE program targeted at low-income HHs can provide long-term support to DH affordability

- Preferential loan or grant to low-income HHs to improve demand-side EE

- Examples:
  - Brazil end-use EE program
    - Investment costs covered by utilities or shared with HHs
      - In the latter case, utilities offer financing schemes, including rebates and monthly payment
    - Eligibility determined by consumption levels and enrollment in other SP schemes
  - US Weatherization Assistance Program
    - Investment costs are covered by state grants
    - Eligibility: mainly based on income levels, using thresholds defined according to the national poverty guidelines
How to Implement Tariff Reform

Financing Mechanisms and Sequencing
Reform packages with positive fiscal savings

<table>
<thead>
<tr>
<th>Year</th>
<th>Fiscal Savings (US$ bln)</th>
<th>Budget of Social Protection (US$ bln)</th>
<th>EE Grant (US$ bln)</th>
<th>Industry Rebate (US$ bln)</th>
<th>Net Fiscal Savings (US$ bln)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Local budget</td>
<td>Industry CS</td>
<td>refined H&amp;U</td>
<td>0.01</td>
</tr>
<tr>
<td>2015</td>
<td>0.15</td>
<td>0.02</td>
<td>0.13</td>
<td>refined H&amp;U</td>
<td>0.01</td>
</tr>
<tr>
<td>2016</td>
<td>0.15</td>
<td>0.02</td>
<td>0.13</td>
<td>refined H&amp;U</td>
<td>0.01</td>
</tr>
<tr>
<td>2017</td>
<td>0.29~0.41</td>
<td>0.04~0.1</td>
<td>0.25~0.31</td>
<td>refined H&amp;U + Expand GASP</td>
<td>0.30</td>
</tr>
<tr>
<td>2020</td>
<td>0.42~0.76</td>
<td>0.06~0.18</td>
<td>0.37~0.59</td>
<td>0.37~0.59</td>
<td>0.06~0.18</td>
</tr>
</tbody>
</table>

Note: Fiscal savings in 2017 and 2020 reflect the range under three tariff increase scenarios.

A recommended roadmap

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Launch consumer communication campaign</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Establish consumer monitoring mechanism</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide preferential loan/grants to low-income HHs for demand-side EE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve social assistance programs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invest on supply-side EE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scale up demand-side EE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The start of the bar shows when to launch the proposed action; the end of the bar indicates when the activity will take effect to mitigate the adverse impact of tariff increase.