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Republic of Serbia

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Weighing of the social, economic and environmental impacts of the mitigation scenarios – Accompanying Document

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## ACRONYMS

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## WEIGHING OF THE SOCIAL, ECONOMIC AND ENVIRONMENTAL IMPACTS OF THE MITIGATION SCENARIOS

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#### 2.3 Environmental Indicators

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ACRONYMS

B2  Baseline Scenario 2
CO2  Carbon Dioxide
CO2e  Carbon Dioxide equivalent
ETS  Emissions Trading System
EU  European Union
EU-ETS  European Union Emissions Trading System
GDP  Gross Domestic Product
GHG  Greenhouse Gas
kt  Kilo tonne
M1  Mitigation Scenario 1
M2  Mitigation Scenario 2
M3  Mitigation Scenario 3
M4  Mitigation Scenario 4
MEuro 13  Million euros (constant prices 2013)
Mio  Million
RES  Renewable Energy Source
t  Tonne
WEIGHING OF THE SOCIAL, ECONOMIC AND ENVIRONMENTAL IMPACTS OF THE MITIGATION SCENARIOS

The four mitigation scenarios modelled for Serbia reflect different approaches, ambitions and efforts in relation to reducing GHG emissions. In doing so, each scenario also has different social, economic and environmental impacts, which can be either positive or negative.

The four mitigation scenarios are:
- M1 scenario: EU-ETS reference scenario (the impacts of the implementation of the EU-ETS in Serbia in isolation of any measures)
- M2 scenario: Full EU scenario (EU acquis is transposed and implemented, including Serbia’s contribution towards the EU 2030 targets: -40% GHG emissions compared to 1990; 32% RES by 2030 and 32,5% enhanced energy efficiency)
- M3 scenario: Serbia individually to achieve the 2030 targets defined to the EU as a whole (-40% GHG emissions compared to 1990; 32% RES by 2030 and 32,5% enhanced energy efficiency)
- M4 scenario: Serbia to achieve 80% GHG cuts in 2050 compared to 1990 levels (aligned with the European Commission communication on climate neutrality).

The following chart shows the emissions reductions modelled in each scenario¹.

Figure 1-1 – Emissions scenarios (B2, M1, M2, M3 and M4)

The GHG emissions reductions achieved are only one dimension of the spectrum of changes resulting from the implementation of the mitigation measures included in each scenario. In order to allow for a broader understanding of the changes in Serbian society brought about by each scenario, 6 social, economic and environmental indicators have been selected and estimated for each scenario.

These indicators are as follows.

Social Indicators

¹ The Result 3 report on the Greenhouse Gas Mitigation Scenarios defined for each of the following years: 2020, 2025, 2030 and 2050, has been discussed and is pending approval by the project steering committee.
• Impacts on employment (this indicator has been calculated by the GEM-E3 model, based on information from all sectors)
• Share of energy costs in household expenditure (this indicator has been calculated by the GEM-E3 model, based on information from the energy sector)

**Economic Indicators**
• GDP (this indicator has been calculated by the GEM-E3 model, based on information from all sectors)
• Household income (this indicator has been calculated by the GEM-E3 model, based on information from all sectors)

**Environmental Indicators**
• Emissions of PM2.5 from fuel combustion (the information for this indicator is coming from the energy sector).
• Nitrogen Balance (this indicator has been selected as a link between climate change mitigation, water quality and climate change impacts; the information for this indicator comes from the agriculture sector).

The GHG emissions reductions in each scenario provide a clear indication of the potential included in each scenario to meet the EU medium-term targets (for 2030) and to align Serbia with the EU and the Paris Agreements long-term goals (2050 and beyond). The six indicators provide an indication of the social, economic and environmental costs and benefits from achieving such GHG emissions reductions in the medium and long terms.

This information will support the decision-making process in relation to the medium and long term visions to include in the Climate Strategy and of the measures to include in the Action Plan.

In order to support the MEP's decision on the above, this questionnaire - the weighing exercise - aims at collecting views from stakeholders on the importance they attach to each type of indicator and on how satisfied they are with the performance of each indicator in each mitigation scenario.

In the first part of the questionnaire below, we ask you to give your opinion in relation to the relative importance you attach to each indicator. While we assume all indicators are important, when you compare them to each other, please try to distinguish their relative importance. For example, do you think social indicators are more or less important, even if just slightly, then economic indicators? Please try to use the full scale from 1 to 6.

In the second part of the questionnaire below, you are asked to express your level of satisfaction with the performance of each indicator in each scenario. For example, if you don't like the impact on employment in a given scenario, you should give it a low classification (close to not satisfied at all). On the contrary, if you like the impact of a scenario on the GDP, you should rank it high (close to extremely satisfied).

Answers to this questionnaire are welcome until May, 17 2019.
2 THE INDICATORS

2.1 Social Indicators

Impacts of employment
Employment: use of available labour resources (people available to work).

The B2 figures for employment represent the net jobs created in the baseline scenario. The percentages in the scenarios represent the impact of mitigation measures compared to baseline (for example, in M2, net jobs created in 2050 would be 0.9% less than those created in B2 by the same year).

Share of energy costs in household expenditure: the amount of expenditure in energy as a percentage of total household expenditures

The B2 figures for share of energy costs in household expenditure represent the share (%) of costs with energy in households in the baseline scenario. The percentages in the scenarios represent the impact of mitigation measures compared to baseline (for example, in M2, the share of energy in household expenditures in 2050 would be 2.5% higher than the share in B2 by the same year).

Table 2-1 - Social impacts indicators: employment and share of energy in household expenditure

<table>
<thead>
<tr>
<th>Social Impacts Indicators</th>
<th>Impacts on Employment (%)</th>
<th>Share of energy costs in household expenditure (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2020</td>
<td>2025</td>
</tr>
<tr>
<td>B2 (net jobs / %)</td>
<td>2462</td>
<td>2468</td>
</tr>
<tr>
<td>M1</td>
<td>0.0</td>
<td>-0.6</td>
</tr>
<tr>
<td>M2</td>
<td>0.0</td>
<td>-1.2</td>
</tr>
<tr>
<td>M3</td>
<td>0.0</td>
<td>-3.0</td>
</tr>
<tr>
<td>M4</td>
<td>0.0</td>
<td>-2.9</td>
</tr>
</tbody>
</table>

2.2 Economic Indicators

GDP: the monetary value of final goods and services—that are bought by the final user—produced in a country in a given period of time (usually a year)
The B2 figures for GDP represent the actual value of Serbian GDP (000Eur) in the baseline scenario. The percentages in the scenarios represent the impact of mitigation measures compared to baseline (for example, in M2, GDP would grow 1.6% less than the growth expected in the same year in B2).

**Household consumption or household spending is the amount of final consumption expenditure** made by resident households to meet their everyday needs, such as: food, clothing, housing (rent), energy, transport, durable goods (notably, cars), health costs, leisure, and miscellaneous services.

The B2 figures for household consumption represent the actual value of Serbian household consumption (000Eur) in the baseline scenario. The percentages in the scenarios represent the impact of mitigation measures compared to baseline (for example, in M2, household consumption would grow 2.9% less than the growth expected in the same year in B2).

**Table 2-2 – Economic impact indicators: GDP and Household consumption**

<table>
<thead>
<tr>
<th>Economic Impacts Indicators</th>
<th>GDP (%)</th>
<th></th>
<th></th>
<th></th>
<th>Household consumption (%)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2020</td>
<td>2025</td>
<td>2030</td>
<td>2050</td>
<td>2020</td>
<td>2025</td>
<td>2030</td>
<td>2050</td>
</tr>
<tr>
<td>B2 (000EUR)</td>
<td>35134</td>
<td>42491</td>
<td>50626</td>
<td>87763</td>
<td>25980</td>
<td>31085</td>
<td>36635</td>
<td>60732</td>
</tr>
<tr>
<td>M1</td>
<td>0.1</td>
<td>-0.4</td>
<td>-0.3</td>
<td>-0.8</td>
<td>-0.6</td>
<td>-1.5</td>
<td>-0.6</td>
<td>-1.9</td>
</tr>
<tr>
<td>M2</td>
<td>0.0</td>
<td>-0.8</td>
<td>-1.0</td>
<td>-1.6</td>
<td>0.0</td>
<td>-2.0</td>
<td>-1.3</td>
<td>-2.9</td>
</tr>
<tr>
<td>M3</td>
<td>0.0</td>
<td>-2.3</td>
<td>-3.5</td>
<td>-1.8</td>
<td>0.0</td>
<td>-2.9</td>
<td>-2.9</td>
<td>-3.1</td>
</tr>
<tr>
<td>M4</td>
<td>0.0</td>
<td>-2.3</td>
<td>-3.4</td>
<td>-3.9</td>
<td>0.0</td>
<td>-2.9</td>
<td>-2.8</td>
<td>-5.5</td>
</tr>
</tbody>
</table>

**2.3 Environmental Indicators**

**Emissions of PM2.5**

Particulate matter (including soot) is emitted during the combustion of solid and liquid fuels, such as for power generation, domestic heating and in vehicle engines. Particulate matter varies in size (i.e. the diameter or width of the particle). PM_{2.5} means the mass per cubic metre of air of particles with a size (diameter) generally less than 2.5 micrometres (µm). PM_{2.5} is also known as fine particulate matter (2.5 micrometres is one 400th of a millimetre).

The B2 figures for emissions of PM2.5 represent the actual value of emissions (kt) in the baseline scenario. The percentages in the scenarios represent the impact of mitigation measures compared to baseline (for example, in M2, PM2.5 emissions would be reduced 24.7% in addition to the reductions already expected in the same year in B2).
**N Balance**

Nitrogen balance is a measure of nitrogen input (from fertilizer, manure, crop residues, etc.) minus nitrogen output (from gaseous loss, run off mineral, etc.). Nitrogen is a vital nutrient that helps plants and crops grow, but high concentrations are harmful to people and nature. The closer to zero the N Balance, the more environmentally friendly.

The B2 figures for emissions of N Balance represent the actual value of the N Balance (kt) in the baseline scenario. The percentages in the scenarios represent the impact of mitigation measures compared to baseline (for example, in M2, the N Balance would be reduced 3,1% in relation to the N Balance expected in the same year in B2).

**Table 2-3 – Environmental impact indicators: emissions of PM2.5 and N Balance**

<table>
<thead>
<tr>
<th>Environmental Impacts Indicators</th>
<th>Air quality: Emissions of PM2.5 (%)</th>
<th>Soil and Water Protection (N Balance) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>2025</td>
<td>2030</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>B2 (kt)</td>
<td>31</td>
<td>30</td>
</tr>
<tr>
<td>M1</td>
<td>2,1%</td>
<td>-0,1%</td>
</tr>
<tr>
<td>M2</td>
<td>8,3%</td>
<td>-0,4%</td>
</tr>
<tr>
<td>M3</td>
<td>8,7%</td>
<td>-7,6%</td>
</tr>
<tr>
<td>M4</td>
<td>8,0%</td>
<td>-8,0%</td>
</tr>
</tbody>
</table>