Sustainable use of energy in transport in South East Europe

Challenges in achieving of EE and RES targets

Radovan Nikčević
Expert on Connectivity
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Why sustainable use of energy in the transport sector is important for us?

- Directive 2006/32/EC on energy end-use efficiency and energy services
  Energy Efficiency Action Plans (national level)
  (measures in sectors of: Buildings, Industry, Services, Transport, and horizontal (cross sectorial measures));

- Directive 2012/27/EU on Energy Efficiency

- Directive 2009/28/EC on the promotion of the use of energy from renewable sources
  National Renewable Energy Action Plans
  (Overall RES target, and sectorial targets: E, H/C adn Transport)
Why transport is so important in terms of energy consumption?

• more than ¼ in total energy consumption in the EU;

• over 300 Mtoe of final energy per annum (last decade);

• 94 % from fossil fuels, 5% biofuels 1% all other propulsion energies;

• 25 % of Europe‘s total GHG emissions;

• 11 million of the EU citizens are employed in the transport sector;

• transport contributes with 5% in the EU GDP.
Energy consumption in the EU

- **Transport sector**
- **Total final energy consumption**

<table>
<thead>
<tr>
<th>Year</th>
<th>Transport Sector</th>
<th>Total Final Energy Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>27.9%</td>
<td>1.000,0</td>
</tr>
<tr>
<td>2010</td>
<td>26.6%</td>
<td>1.200,0</td>
</tr>
<tr>
<td>2011</td>
<td>27.7%</td>
<td>1.400,0</td>
</tr>
<tr>
<td>2012</td>
<td>26.9%</td>
<td>1.600,0</td>
</tr>
<tr>
<td>2013</td>
<td>26.6%</td>
<td>1.800,0</td>
</tr>
<tr>
<td>2014</td>
<td>28.0%</td>
<td>2.000,0</td>
</tr>
</tbody>
</table>
Energy consumption in six WB economies

- 2009: 28.8% Transport sector, 15.1% Total final energy consumption
- 2010: 27.1% Transport sector, 15.3% Total final energy consumption
- 2011: 25.5% Transport sector, 15.5% Total final energy consumption
- 2012: 25.8% Transport sector, 15.6% Total final energy consumption
- 2013: 26.3% Transport sector, 15.7% Total final energy consumption
- 2014: 27.0% Transport sector, 15.8% Total final energy consumption

Mtoe

- 2009: 15.2
- 2010: 15.3
- 2011: 15.4
- 2012: 15.5
- 2013: 15.6
- 2014: 15.7
Energy consumption in transport per capita

Ratio between an average EU citizen and a citizen in Western Balkans

toe per annum
The most frequently used fuels in WB

ktoe in 2014

- **AL**: 804
- **BA**: 977
- **MK**: 531
- **Kosovo ***: 338
- **ME**: 173
- **RS**: 1959

* This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence

** The full name of MK is: The Former Yugoslav Republic of Macedonia
The most frequently used fuels in the EU

Source: International Energy Agency
Status in the SEE region

• Despite a lot of efforts and lot of concrete achievements (implementation of measures from EEAPs) the region did not reach its full Energy Efficiency Potential yet.

  Energy Efficiency Plan 2011 (COM(2011)109final) identified sectors with highest energy saving potentials:
  - Buildings
  - Transport

• Renewable energies in the transport sector are far below trajectories given in NREAPs of the SEE economies.
  - biofuels (preconditions are not met)
  - renewable electricity (railways and road transport).
RCC recognized potential and need to support South East European economies in line with SEE 2020 Strategy.

- To help SEE economies to develop their strategies for energy efficient transport and implement measures from their NEEAPs.

- To help SEE economies to achieve their RES transport targets. through establishing preconditions for biofuels and renewable electricity in road and railway transport.
A case study from Montenegro
Headlamps vs LED DRL on vehicles

• Project Sustainable use of Energy in Montenegro;

• Three studies developed within the project (among other results)...
  1. Biofuels
  2. Alternative fuels
  3. Energy Efficiency
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- Daytime Running Lights (DRL) after 7th February 2011 for all passenger cars and small vans.

- For trucks and busses from 7th August 2012.

- Directive 2008/89/EC introduced this requirement, imposing obligations to all member states to transpose it in national legislation.

- A country may regulate by its law the use of DRL.
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• Vehicles use different technologies to meet this requirement.

Option A:
Older car models use headlamps to light the road ahead and as DRL (in order to become easy to notice).
  - Tungsten filament bulbs
  - Halogen lamps
  - High intensity discharge lamps (HID)
  - Laser technology -(state of the art technology)

Option B:
New car models have specially designed DRL - LED technology
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Montenegro has around 200,000 passenger vehicles.

\[
\begin{align*}
182 \text{ hours yearly} \times 120 \text{ W} \times 160,000 \text{ vehicles} &= 3,494,400 \text{ kWh} \\
182 \text{ hours yearly} \times 5 \text{ W} \times 160,000 \text{ vehicles} &= 145,600 \text{ kWh}
\end{align*}
\]

\[3,494,400 - 145,600 = 3,348,800 \text{ kWh} \quad (95.8\% \text{ - possible savings})\]

Two halogen lamps (2 x 55 W) + two parking lamps (position lamps) (2 x 5W) = 120 W;
Dedicated LED DRL system consumes 5 W instead, (usually it is between 5 and 20 W);
There are 160,000 registered vehicles manufactured before 2011 (it means not equipped with dedicated DRL, but use headlamps for drive during the day);
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Energy must be produced by vehicle engine

<table>
<thead>
<tr>
<th>FUEL TYPE</th>
<th>% of vehicles</th>
<th>number of vehicles</th>
<th>energy used (GWh)</th>
<th>quantity of fuel (l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel fuel</td>
<td>65,0 %</td>
<td>104.000</td>
<td>2.18</td>
<td>220.854</td>
</tr>
<tr>
<td>Gasoline</td>
<td>31,0 %</td>
<td>49.600</td>
<td>1.04</td>
<td>111.953</td>
</tr>
<tr>
<td>LPG</td>
<td>4,0 %</td>
<td>6.400</td>
<td>0.13</td>
<td>18.272</td>
</tr>
<tr>
<td>Total:</td>
<td></td>
<td>160.000</td>
<td>3.35</td>
<td>351.079</td>
</tr>
</tbody>
</table>
A case study from Montenegro

• Converted into fuels
Good. Better. Regional.