SEER MAP
RES Training
RES support scheme in Serbia, results and challenges

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CONTENTS

RES WITHIN ENERGY LAW
NATIONAL RES ACTION PLAN
INCENTIVE MEASURES
TSO&DSO
RES WITHIN ENERGY LAW
ENERGY LAW DEFINITIONS

- **renewable energy sources** are non-fossil sources of energy such as: watercourses, biomass, wind, sun, biogas, landfill gas, gas from sewage water treatment plants, and geothermal energy sources;

- **producer from renewable energy sources** is an energy facility generating electricity from renewable energy sources and is entitled to guarantees of origin pursuant to this Law;

- **privileged electricity producer** is an energy entity generating electricity from renewable energy sources or highly efficient combined production of electricity and thermal energy from natural gas, and is entitled to incentive measures pursuant to this Law;

- **incentive measures** are instruments or mechanisms of support to electricity generation from renewable energy sources or to highly efficient combined production of electricity and thermal energy;
PRIVILEGED ELECTRICITY PRODUCER

- An energy entity may acquire the **status of a privileged electricity producer** (hereinafter: a privileged producer) for a power plant or part of a power plant if:
  - it uses **renewable energy sources** in the electricity generation process and
  - meets the conditions referring to the installed power
    - up to 30 MW in hydro power plants;
  - The Government prescribes the conditions and procedure of acquisition, duration and termination of the status of a privileged producer
  - Status of a privileged producer gives **ability to use incentive measures**
RES PRODUCER

- An energy entity and natural person may acquire the status of a producer of electricity from renewable sources (hereinafter: the producer from renewable sources) for that power plant if:
  - It uses renewable energy sources in the electricity generation process
  - Other technical and regulatory conditions may not simultaneously have the status of a producer from renewable sources and the status of a privileged producer
  - The energy entity and/or natural person for the same power plant.
  - Status of a producer of electricity from renewable sources gives ability to obtain guarantee of origin
RES BYLAWS

- Enacted from 16 June 2016
  - Regulation on the requirements and procedure of acquiring the status of a privileged producer, preliminary privileged producer and producer from renewable energy sources
  - Regulation on incentive measures for the production of electricity from renewable sources and from high-efficiency electricity and thermal energy cogeneration
  - Regulation on the power purchase agreement (PPA)
- RES National Action Plan
- Available on RES section at Ministry website: www.mre.gov.rs
RES BYLAWS REACTIONS

- Regulations has been developing in cooperation with International Financial Institutions
- "You can clearly see they are the result of lengthy discussions with the international financial institutions, which is important, but something you don’t see very often." Wind Power Monthly
- First due diligence assessment very positive by C.M.S

  **It was worth the wait!!!**

- "The result is a consistent, comprehensive and, at least on the face of it, bankable set of regulations to govern the renewable sector in Serbia in a manner which appears to be unmatched in the entire Western Balkan region in terms of both the quality of drafting and the completeness of the solutions implemented."

  **Overall, the newly adopted PPA Package is a great step forward for renewables in Serbia!!!**
NATIONAL RES ACTION PLAN
ENERGY LAW REQUIREMENTS

- Government adopts and monitors the National Action Plan for the use of RES which comprise:
  - the mandatory and planned share of energy from RES
  - the dynamics of the achievement and deadlines
  - measures necessary for the development of distance heating and cooling infrastructure
  - measures ensuring the development of appropriate programs for the development and use of RES
- The National Action Plan is harmonised with regulations governing energy efficiency and reduction of the greenhouse gases emission and RES National Energy Strategy
RES STRUCTURE

- Bioregradable waste: 1%
- Used hydro: 16%
- Unused hydro: 14%
- Geothermal: 3%
- Wind: 2%
- Solar: 4%
- Used biomass: 19%
- Unused biomass: 41%
RES target - new plants till 2020.

- **Total new RES in 2020**: 1092 MW
  - Wind energy: 500 MW
  - HPP (over 10 MW): 250 MW
  - SHPP (up to 10 MW): 188 MW
  - Biomass – CHP plants: 100 MW
  - Biogas (manure) – CHP plants: 30 MW
  - Solar energy: 10 MW
  - Landfill gas: 10 MW
  - Waste: 3 MW
  - Geothermal energy: 1 MW

- **Serbia has enough RES potential to go beyond 2020 RES targets**
- **Cooperation agreement signed with Italy for joint projects based on HPPs**
- **2016-2020 - expect exporting 975 GWh (cca 84 ktoe) to count towards Italian target**
INCENTIVE MEASURES
The incentive measures for privileged electricity producers include:
- the obligation of purchasing electricity from a privileged producer;
- prices at which such electricity is purchased
- the validity period of the electricity purchase obligation;
- undertaking balance responsibility;
- other incentive measures

A privileged producer is entitled to incentive measures by the conclusion of an agreement on electricity purchase with a guaranteed supplier.
REGULATION ON INCENTIVE MEASURES

- **12 years** incentive period
- **Not financed from Budget** of Republic of Serbia, but from **special fee** born by all final electricity consumers
- privileged producers **sell to the guaranteed supplier**
- balancing responsibility and **balancing costs allocated to the guaranteed supplier**
- **Free of charge access** to electricity transmission/distribution systems
- **regular annual adjustment** of the incentive purchase prices due to inflation in the Eurozone
## Incentive Purchase Price (1)

<table>
<thead>
<tr>
<th>No.</th>
<th>Type of power plant of the privileged producer of electricity</th>
<th>Installed power – $P$ (in MW)</th>
<th>Incentive purchase price (€/kWh)</th>
<th>Maximum effective operating time (h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Hydro power plant</td>
<td>up to 0.2</td>
<td>12.60</td>
<td>5000 in a year of the incentive period</td>
</tr>
<tr>
<td>1.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td></td>
<td>0.2 – 0.5</td>
<td>13.933 – 6.667*P</td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td></td>
<td>0.5 – 1</td>
<td>10.60</td>
<td></td>
</tr>
<tr>
<td>1.4</td>
<td></td>
<td>1 – 10</td>
<td>10.944 – 0.344*P</td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td></td>
<td>10 – 30</td>
<td>7.50</td>
<td></td>
</tr>
<tr>
<td>1.6</td>
<td>On the existing infrastructure</td>
<td>up to 30</td>
<td>6.00</td>
<td>5000 in a year of the incentive period</td>
</tr>
<tr>
<td>2.</td>
<td>Biomass power plants</td>
<td></td>
<td></td>
<td>8600 in a year of the incentive period</td>
</tr>
<tr>
<td>2.1</td>
<td></td>
<td>up to 1</td>
<td>13.26</td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td></td>
<td>1 – 10</td>
<td>13.82 – 0.56*P</td>
<td></td>
</tr>
<tr>
<td>2.3</td>
<td></td>
<td>up to 10</td>
<td>8.22</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Biogas power plants</td>
<td></td>
<td></td>
<td>8600 in a year of the incentive period</td>
</tr>
<tr>
<td>3.1</td>
<td></td>
<td>0 – 2</td>
<td>18.333 – 1.111*P</td>
<td></td>
</tr>
<tr>
<td>3.2</td>
<td></td>
<td>2 – 5</td>
<td>16.85 – 0.370*P</td>
<td></td>
</tr>
<tr>
<td>3.3</td>
<td></td>
<td>over 5</td>
<td>15</td>
<td></td>
</tr>
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</table>
### Incentive Purchase Price (2)

<table>
<thead>
<tr>
<th>No.</th>
<th>Type of power plant of the privileged producer of electricity</th>
<th>Installed power – P (in MW)</th>
<th>Incentive purchase price (€/kWh)</th>
<th>Maximum effective operating time (h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Landfill gas power plants and the gas from municipal waste water treatment facilities</td>
<td></td>
<td>8.44</td>
<td>8600 in a year of the incentive period</td>
</tr>
<tr>
<td>5.</td>
<td>Wind power plants</td>
<td></td>
<td>9.2</td>
<td>9000 in a three-year quarter of the incentive period</td>
</tr>
</tbody>
</table>
# Incentive Purchase Price (3)

<table>
<thead>
<tr>
<th>No.</th>
<th>Type of power plant of the privileged producer of electricity</th>
<th>Installed power – P (in MW)</th>
<th>Incentive purchase price (€/kWh)</th>
<th>Maximum effective operating time (h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Solar power plants</td>
<td></td>
<td></td>
<td>1400 in a year of the incentive period</td>
</tr>
<tr>
<td>6.1</td>
<td>On a facility of up to 0.03</td>
<td></td>
<td>14.60–80*P</td>
<td></td>
</tr>
<tr>
<td>6.2</td>
<td>On a facility of 0.03 – 0.5</td>
<td></td>
<td>12.404–6.809*P</td>
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</tr>
<tr>
<td>6.3</td>
<td>Out of facility</td>
<td></td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Geothermal power plants</td>
<td></td>
<td>8.2</td>
<td>8600 in a year of the incentive period</td>
</tr>
<tr>
<td>8.</td>
<td>High-efficiency cogeneration natural gas power plants</td>
<td></td>
<td></td>
<td>8600 in a year of the incentive period</td>
</tr>
<tr>
<td>8.1</td>
<td>up to 0.5</td>
<td></td>
<td>8.20</td>
<td></td>
</tr>
<tr>
<td>8.2</td>
<td>0.5–2</td>
<td></td>
<td>8.447 – 0.493*P</td>
<td></td>
</tr>
<tr>
<td>8.3</td>
<td>2–10</td>
<td></td>
<td>7.46</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Waste power plants</td>
<td></td>
<td>8.57</td>
<td>8600 in a year of the incentive period</td>
</tr>
</tbody>
</table>
Effects of feed-in tariffs (1)

Source: Register of Privileged Power Producers
Effects of feed-in tariffs (2)

- Temporary privileged status amounted 500 MW!!!
- Ministry has got the bank guaranties amounted 2% of investment as assurance the farms will built!
  ~16,632,736 EUR!!!
- The wind goals probably will be achieved!

Source: Serbian NREAP Progress Report 2014
Effects of feed-in tariffs (3)

Source: Register of Privileged Power Producers
Conclusions

- **RES utilization is a strategic commitment** of Republic of Serbia & has a lot of indirect benefits as for the energy sector so for the society
- **RES legislation** is attractive and mostly harmonized with EU one
- **Dynamics** of RES projects realization still under expectations but first Feed-in tariffs effects are visible
- **Energy market still not developed** enough to let new RES plants to market without subsidies
TSO & DSO
TSO & DSO

- TSO & DSO integrate electricity production capacities and optimally use renewable energy sources
- Transmission/distribution tariff: Producers do not pay
- Connection tariff: Producers pay construction of connecting lines and connection facility (TSO/DSO property) - shallow approach
- Operation: TSO & DSO primarily take over electricity generated from RES, except in case that the safety of the transmission/distribution system operation is endangered
Transmission system development and RES connection

- Temporary status of privileged producer:
  - WPP Plandište (102 MW)
  - WPP Čibuk 1 (158.5 MW)
  - WPP Alibunar (42 MW)
  - WPP Kovačica (104.5 MW)
  - WPP Košava (117 MW) – partially
- SUM: 500 MW until 2020
- Long-term (10 years) development plan
Operation planning and real-time operation

- Prediction of RES generation (accuracy of network models, reserve planning)?
- RES in NTC calculation?
- Reassessment of secondary (aFRR) and tertiary (mFRR) reserve – network code pluralistic methodology?
- Common reserve dimensioning – SMM Control Block
- Cross-border (mFRR activation) EMS - CGES
- Imbalance Netting (aFRR activation) SMM in 2017 – WB6 & beyond?
QUESTIONS?