Sustainable development in energy sector of Azerbaijan

Pathways for sustainable energy: National approaches to a global challenge” Workshop

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Current status of RE development in Azerbaijan

The State Program on Use of Alternative and Renewable Energy Sources in Azerbaijan Republic:

- To determine potential of alternative and renewable energy in the electricity power generation;
- To increase the efficiency of utilization of energy resources through attracting exploitation of renewable energy;
- To provide additional job places by creating new energy production facilities;
- To increase energy capacity and achieve energy security at expense of renewables by considering total capacity of traditional energy sources in Azerbaijan Republic.
Strategic directions of RE development in Azerbaijan (2012-2020)

- Clarification of the main objectives of the heat and power energy production in RE sector;
- Creation of the base of legal framework in RE and EE;
- Preparation of incentive measures on the use of RE;
- Application of RE and EE in the spheres of economy;
- The production of electricity and thermal energy to determine the main directions for the years 2012-2020 by ARES;
- Establishment of legal and regulatory framework in the sphere of ARES;
- Implementation of promotional events on the use of ARES;
- Provision using ARES in all sectors of economy based on domestic and international scientific and technical potential.
Targets for RE development by 2020

- 20% share of RE in electricity
- 9.7% share of RE in all energy consumption
- 2,000 MW of installed RES capacity by 2020
The implementation directions of Agency’s state policy

- Energy
- Innovation
- Sustainable development
# RE Development


<table>
<thead>
<tr>
<th>RE Sources</th>
<th>Capacity in MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind</td>
<td>~ 67</td>
</tr>
<tr>
<td>Solar</td>
<td>~ 49</td>
</tr>
<tr>
<td>Hydro</td>
<td>~ 1125</td>
</tr>
<tr>
<td>Biomass</td>
<td>~ 2</td>
</tr>
<tr>
<td>Waste</td>
<td>~ 45</td>
</tr>
</tbody>
</table>
**RE Development**

**Energy dynamics of Azerbaijan for 2011-2015**

- **Oil**: 46949, 44632, 44717, 43295, 42835 thousand toe
- **Natural gas**: 15265, 16086, 16696, 17565, 17947 thousand toe
- **R.E.**: 326, 254, 285, 271, 301 thousand toe

**ENERGY SHARE OF AZERBAIJAN**

- **Oil**: 70.47%
- **Natural gas**: 29.52%
- **R.E.**: 0.49%

**Emissions of air pollutants from stationary sources**

- **1995**: 878.6 thousand tons
- **2000**: 515.4 thousand tons
- **2005**: 425.9 thousand tons
- **2010**: 339.8 thousand tons
- **2015**: 357.9 thousand tons

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**Source**: AREA
Share of RE & non-RE sources in energy supply, mln kW hour

Renewable sources
Non-renewable sources
Share of RE & non-RE sources in energy supply, %

<table>
<thead>
<tr>
<th>Year</th>
<th>Renewable sources</th>
<th>Non-renewable sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>81.2%</td>
<td>18.8%</td>
</tr>
<tr>
<td>2011</td>
<td>86.3%</td>
<td>13.7%</td>
</tr>
<tr>
<td>2012</td>
<td>91.9%</td>
<td>8.1%</td>
</tr>
<tr>
<td>2013</td>
<td>92.9%</td>
<td>7.1%</td>
</tr>
<tr>
<td>2014</td>
<td>93.9%</td>
<td>6.1%</td>
</tr>
<tr>
<td>2015</td>
<td>92.6%</td>
<td>7.4%</td>
</tr>
<tr>
<td>2016</td>
<td>91.4%</td>
<td>8.6%</td>
</tr>
<tr>
<td>2017</td>
<td>89.8%</td>
<td>10.2%</td>
</tr>
<tr>
<td>2018</td>
<td>88.8%</td>
<td>11.2%</td>
</tr>
<tr>
<td>2019</td>
<td>85.1%</td>
<td>14.9%</td>
</tr>
<tr>
<td>2020</td>
<td>79.5%</td>
<td>20.5%</td>
</tr>
</tbody>
</table>

Renewable sources
Non-renewable sources
Half of global energy in 2050

Which is sustainable?

Renewable

Carbohydrate
<table>
<thead>
<tr>
<th><strong>Small-sized</strong></th>
<th><strong>Medium-sized</strong></th>
<th><strong>Large-sized</strong></th>
</tr>
</thead>
</table>
| • 1 building – 1 power plant | • Hybrid power plants  
  • Gobustan Experimental Polygon  
  • Pirallahy Wind Islands  
  • Surakhany Solar Electric station | • Wind, Biogas and Concentrated Solar plants  
  • Samukh Agro-Energy Residential Complex  
  • Yeni Yashma Wind Farm  
  • Wind Island  
  • Absheron Wind Farm  
  • Power Plants on Biomass |
| 14 buildings with Solar panels (schools, medical centers, sport complexes) | | |
Gobustan Polygon (5.5MW)

Wind turbines – 2.7MW
Solar panels – 1.8MW
Biomass – 1 MW

4.5 q ~ $0.03

Azerishiq

6 q ~ $0.04

Regions
Pirallay Wind Islands (200MW)

Project cost - 400 mln euros

Project period 2016-2018

Goals:
Creation of advanced electric power infrastructure
Support of sustainable development
Reduction of environment pollution
Cut of natural gas production
Azguntex (2011) is a unique power plant on producing advanced solar modules and LED lamps with total capacity of 30MW.

“Thousand houses – thousand power stations” is a project to transform the solar energy to electric energy and provide each house separately with ecologically pure solar energy.

Advantages:
automated high-tech
high efficiency
Implementation of polycrystal cells
RE in our life

Energy policy on RE

- Reduction of the national gas demand and increase energy export volumes
- Location of energy plants near the users of the power
- Reduction of costs for upgrading networks and losses during electricity transmission
Future aims

Enhancement of RE share in Electricity and Heat Generation

Improvement of Legislative base

Application of RE in all sectors of economy

Development of stimulation mechanisms
Thank you for your attention!

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