The main directions of developing renewable energy sources in Uzbekistan

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Potential of renewable energy sources

Uzbekistan has a great potential of developing RES in the following directions:

• solar energy;
• biogas;
• wind energy;
• micro hydro generation;
Push to expansion

According to the Decree of the President of the Republic of Uzbekistan dated 01.03.2013, №4512 "On measures for further development of alternative energy sources“, principal attention is being paid to broader use of solar energy and biogas. Because, nowadays there are existing all means to implement projects in these directions in all territory of Uzbekistan.
Push to expansion

There are not only projects and measures, but also research works are being done in other directions, such as:

• wind energy;
• micro hydro generation;
• utilization of waste;
• other directions;
THE BRIEF HISTORY OF SOLAR ENERGY USE

In Uzbekistan, for many decades, attention has been paid to the solar energy researches. The first development in the field of solar energy in Uzbekistan began nearly 80 years ago, in the past 1932, when a laboratory of solar engineering was created in Samarkand. During 1940 and 1950s the first parabolic concentrator was built and the scientific investigations were commenced on solar energy conversion into electricity, after that the first photovoltaic installation was built.

In 1943, The physical-technical institute (PhTI) was organized, which was the first academic institution engaged in extensive research in the field of physics and engineering in a territory of Central Asia.
In 1986, the Institute of Physics-Sun was organized on the basis of The physical-technical institute.

In 1987 a unique optical mirror complex with a big solar furnace, which thermal power is 1 MW was put into operation.

Since 1965, The physical-technical Institute of Physics-Sun has been publishing The international journal “GELIOTEHNIKA”. The journal is translated into English by the company “Allerton Press” (USA) and it is published in the United States under the name “Applied Solar Energy”. 
SOLAR RESOURCE IN UZBEKISTAN

DNI (kWh/m² per year) | GHI (kWh/m² per year)
---|---
1,165 | 1,390
1,700 | 1,700
2,225 | 1,950
The gross potential of solar radiation in the Republic of Uzbekistan is estimated to be in the range from 525 billion kWh up to 760 billion kWh (reference: irsolav.com)
LAND REQUIREMENTS

- Surface of Uzbekistan is 44.7 million ha.
- More than 70% of its surface is suitable to build and install solar power stations.
Creation of the International Solar Energy Institute

A Memorandum of Understanding between ADB and the Government of the Republic of Uzbekistan on the establishment of the International Solar Energy Institute (ISEI) and the development of the solar energy sector in Uzbekistan was signed on.....

The Resolution of the President of Uzbekistan №PP-1929 "On creation of the International Institute for Solar Energy“ was issued on 1/03/2013.
The International Solar Energy Institute

ISEI is ready for co-operation on following areas:

• applied research and R&D on PV and CSP plants and their components;
• certification and international accreditation of above mentioned testing labs;
• developing of Pilot industrial projects;
• engineering and design according to international standards;
• development of technology for new solar materials and their use.

The ISEI is established and targeted to intensify the activity in the sphere of solar energy use and to become an international hub on solar technologies!
The project implementation is to be done in accordance with the Decree of the President of the Republic of Uzbekistan dated 01.03.2013, №4512 "On measures for further development of alternative energy sources".
Sources of funding

The project is planned to be financed by the Asian Development Bank, the Fund for Reconstruction and Development of Uzbekistan (UFRD) and "Uzbekenergo" company, including:
• hiring a consulting firm to supervise the project and the contract for construction on the "turn-key" basis is financed by the ADB and UFRD;
• related infrastructure and external power lines’ construction are financed by "Uzbekenergo";
Current status of the project

- Memorandum of Understanding (MOU) was signed among Ministry of Finance of the Republic of Uzbekistan, UFRD, SJSC “Uzbekenergo” and ADB on 2.08.2013.
- Feasibility study of the project has been already developed and according to the financial model the cost for electricity is expected to be at most 7 cents (U.S.) / kWh.
- Board of Directors of the ADB on 20.11.2013 approved a loan in the amount of 110.0 million U.S. dollars for the project.
- Currently ITB for selection of consultants and contractors for construction on “turn-key” basis is being prepared.
- Other works are being conducted in accordance with the requirements of ADB
Production of photovoltaic panels in Uzbekistan

The project implementation is to be done in accordance with the Decree of the President of the Republic of Uzbekistan dated 01.03.2013, №4512 "On measures for further development of alternative energy sources“. It’s being implemented by SJC “Uzbekenergo” jointly with Chinese partners in Free industrial economic zone “Navoi”. Its capacity is at the first stage will be 50 MW solar panels per year. In the future it is planned to reach capacity of 100 MW per year.

Currently project documentation and JV agreements are being finalized.
Technical potential of biogas production in Uzbekistan:
8,9 bln. cubic. m. / year

Resource of biogas in comparison with the production of natural gas in the republic:
10%

60-65 bln. cubic. m./year methane production in the republic
Demo-center for biogas technologies

- Held 19 training sessions
- Trained more than 300 farmers
- Distributed more than 1,200 publications
  - Roadmap for the development of biogas technology market in Uzbekistan
  - The use of biogas for autonomous power supply in the farms
  - Biogas. 11 steps to the target
- 2 built biogas installations

Demo centers have been established by UNDP jointly with GEF Small Grants Program
Biogas plant in the farm «Milk agro»
(Zangiata, Uzbekistan)

UNDP Project
"Promotion of Biogas Technology in Uzbekistan"

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<tr>
<th>Technical characteristics</th>
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<td>Power</td>
<td>300 m³ tonnes in a year</td>
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<tr>
<td>Volume</td>
<td>120 tonnes in a year</td>
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<tr>
<td>Biofertilisers</td>
<td>2800 tonnes in a year</td>
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<td>Loadings</td>
<td>5-7 tonnes manure daily</td>
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<tr>
<td>Electric power</td>
<td>20 kWt*h</td>
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Biogas plant in the farm «Nadejda»
(Syrdarya region, Uzbekistan)

The UNDP and GEF
"Using biogas plant as an
alternative source of energy,
heating and electricity"

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<td>Power</td>
<td>25 m³ tonnes in a year</td>
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<tr>
<td>Volume</td>
<td>30 tonnes in a year</td>
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<td>Biofertilisers</td>
<td>300 tonnes in a year</td>
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<td>loadings</td>
<td>5 tonnes in a week</td>
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<td>Electric power</td>
<td>5 kWt*h</td>
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THE LIST OF EXPERIMENTAL AND PILOT PROJECTS ON THE IMPLEMENTATION OF SOLAR AND BIOGAS ENERGY

In accordance with the Decree of the President of the Republic of Uzbekistan dated 01.03.2013, №4512 "On measures for further development of alternative energy sources“, on the 25th of July, 2013, by the Cabinet of Ministers of Uzbekistan was approved “The list of experimental and pilot projects on the implementation of solar and biogas energy in 2013-2018 years”. It includes projects for installation of: biogas units with the total cost of more than 14 mln. USD, PV units with the total cost of more than 100 mln USD.
Thank you for your attention!