





The State Agency on Alternative and Renewable Energy Sources of the Republic of Azerbaijan

Overview of the renewable energy developments in Azerbaijan

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Current status of RE development in Azerbaijan

Existing legislation on RE:

- On the use of energy resources (1996);
- About Electric Energy (1998);
- About Energy (1998);
- About Electric and heat power plants (1999);
- "On the use alternative and renewable energy sources" (draft);
- About energy efficiency (draft).



Current status of RE development in Azerbaijan

Strategic support of developing RE:

- The State Program on Use of Alternative and Renewable Energy Sources in Azerbaijan Republic (2004);
- Order of President of the Republic of Azerbaijan "On the development of the State Strategy on use of alternative and renewable energy sources in the Republic of Azerbaijan for 2012-2020";
- Decree of President of the Republic of Azerbaijan on approval of "AZERBAIJAN 2020: LOOK INTO THE FUTURE" DEVELOPMENT CONCEPT.
- The state program for the development of industry in Azerbaijan in 2015-2020 was approved by the the Presidential Order No. 964, dated December 26, 2014
- Strategic Road Map for the development of utilities (electricity and thermal energy, water and gas supply) in the Republic of Azerbaijan (Approved by presidential decree of the Republic of Azerbaijan of March 16, 2016 no. 1897)







Types of renewable energy potential



Types of renewables	Resource potential (MW)	Technical potential (MW)	Economic potential (MW)
Wind	84 262	> 15000	3000
Solar	4 300 143	> 115200	23040el/5000th
Biomass: -cotton stalk(1 mln t) -Wheat straw(1,4 mln t) -biogas - Waste (2 mln t)	552 576 280 200	> 900	380el/760th
Hydro energy (small rivers)	2500	> 650	520
Geotermal	800	≈200	40
Total	4 390327	>131950	26940el/5800th



Three-stage energy model of RES development





1 house – 1 power plant



 Projects in more than 20 was implemented in the different regions of the Republic(schools, medical centers, sport complexes)



Regional hybrid power plants





Gobustan Experimental Polygon and Training Center

- ≻ Total capacity 6.4 MW
- Connected to the grid 4.4 MW
- Wind PP 2.7 MW
- Solar PP 1 MW (additional 2 MW capacity installed, but not connected)
- Biogas PP 0.7 MW

Was put into operation in 2011



Regional hybrid power plants



Samukh Agro-Energy Residential Complex

Implementation of alternative and renewable energy sources in economic sectors

Total capacity:

31 MW electric,

48 MW thermal

solar component (2.8 MW) additional capacity is being installed



Project period: 2014-2020



Industrial power plants



Pirallahy Solar Power Plant

Installed capacity: 2.8 MW

Surakhany Solar Power Plant

Installed capacity: 2.8 MW

Sumgait SPP

Installed capacity: 2.8 MW



Industrial power plants



Sitalchay Wind farm

Installed capacity : 3.6 MW



Hokumali Wind farm

Installed capacity : 8.0 MW

Yeni Yashma Wind farm

Installed capacity: 1.7 MW



Balakhani Waste-to-Energy Plant



Type of plant	Project area	Source of biomass	Total capacity	Production capacity (kWh/year)	Cooperation
Incineration	Balakhani	Municipal solid waste (operation of 500.000 ton per year)	37 MW	231,5 million	"CNİM" S.A.



Was put into operation in 2012

Strategic Road Map for the development of utilities (electricity and thermal energy, water and gas supply) in the Republic of Azerbaijan

(Approved by presidential decree of the Republic of Azerbaijan ofnDecember 6, 2016 no. 1138)

Stages of Strategic Roadmap

Strategic view to 2020 Long-term view for the period up to 2025 Target view for the post-2025 period

During the next 5-10 years, in order to increase the generation capacity by 1000 MW, investments will be made for supplying sufficient amount of electricity in addition to planned investments. We expect 420 MW capacity at the expense of renewable energy sources (350 MW wind, 50 MW solar, 20 MW bioenergy) up to 2020

Expected result and result indicators

Through implementing the priority on renewable energy in the national production portfolio, 70 million AZN increase in GDP (50 million AZN directly, 20 million AZN indirectly) and creation of 270 new jobs are projected until 2020.

Key Performance Indicators:

• Investment in 350 MW wind energy, 50 MW solar energy and 20 MW bioenergy to diversify energy portfolio;

• Export of saved natural gas to Europe via Trans Adriatic Pipeline and Trans Anatolian Pipeline (as a result of actions taken in this area.



The actual state of renewable energy in the energy system of Azerbaijan

The share of renewable energy in total energy production

MW	0/								
	70	18.4							
7550	100								
1268	16,9		13.2						
								9.6	9.8
1133	89			7.9	64	6.9	8.3		
66	5,2								
29	2,2								
38	2,9								
	7550 1268 1133 66 29 38	7550 100 1268 16,9 1133 89 66 5,2 29 2,2 38 2,9	7550 100 1268 16,9 1133 89 666 5,2 29 2,2 38 2,9	7550 100 1268 16,9 1133 89 666 5,2 29 2,22 38 2,9	7550 100 1268 16,9 1133 89 66 5,2 29 2,2 38 2,9	7550 100 1268 16,9 1133 89 66 5,2 29 2,2 38 2,9	7550 100 1268 16,9 1133 89 66 5,2 29 2,2 38 2,9	7550 100 1268 16,9 1133 89 66 5,2 29 2,2 38 2,9	7550 100 1268 16,9 1133 89 66 5,2 29 2,2 38 2,9

2010 2011 2012 2013 2014 2015 2016 2017

0/



Power installation up to 2030



Distribution of RES investments by year 2018-2020 due to implementation of "Strategic road map for the development of utilities (electricity and thermal energy, water and gas) in the Republic of Azerbaijan"

N Type Project title Power, for 2018-2020, min, manats 2019 2020 current status of the Project I TOTAL 420.0 1153.4 37.6% willion manats % million manats % % % % % % % % % % % % % % % % % <			e Project title	Power, MW	Required investments for 2018-2020, mln.	including:							
N Hype Hole time MW Hole 200-50.5, million manals % million manals <thmillion< th=""> % <thmillion< t<="" td=""><td>N</td><td>Type</td><td>20</td><td>18</td><td>20</td><td>19</td><td>202</td><td>20</td><td>Current status of the Project</td></thmillion<></thmillion<>	N	Type				20	18	20	19	202	20	Current status of the Project	
Image: Control of the state of the	1	Type				0/2	million	0/2	million	0/0	million	Current status of the Project	
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3.3 A Barda 3.0 15.3 10.0% 1.5 50.0% 7.7 40.0% 6.1 TFS 3.4 Barda 2.0 15.3 60.0% 9.2 40.0% 6.1 0.0% 0.0 TFS 3.5 Samukh ARC 2.0 10.2 10.0% 1.0 70.0% 7.1 20.0% 2.0 TFS 3.6 Absheron 1.0 10.2 10.0% 1.0 50.0% 5.1 40.0% 4.1 TFS 3.7 Yalama 1.0 5.1 10.0% 0.5 70.0% 3.6 20.0% 1.0 TES	3.2	Jai	Siazan	3.0	40.8	10.0%	4.1	60.0%	24.5	30.0%	12.2	TFS	
3.4 3.4 Barda 2.0 15.3 60.0% 9.2 40.0% 6.1 0.0% 0.0 TFS 3.5 3.6 Samukh ARC 2.0 10.2 10.0% 1.0 70.0% 7.1 20.0% 2.0 TFS 3.6 Absheron 1.0 10.2 10.0% 1.0 50.0% 5.1 40.0% 4.1 TFS 3.7 Yalama 1.0 5.1 10.0% 0.5 70.0% 3.6 20.0% 1.0 TES	3.3	l y	Hovsan Aeration	3.0	15.3	10.0%	1.5	50.0%	7.7	40.0%	6.1	TFS	
3.5 5 Samukh ARC 2.0 10.2 10.0% 1.0 70.0% 7.1 20.0% 2.0 TFS 3.6 3.6 Absheron 1.0 10.2 10.0% 1.0 50.0% 5.1 40.0% 4.1 TFS 3.7 Yalama 1.0 5.1 10.0% 0.5 70.0% 3.6 20.0% 1.0 TFS	3.4	lerg	Barda	2.0	15.3	60.0%	9.2	40.0%	6.1	0.0%	0.0	TFS	
3.6 Absheron 1.0 10.2 10.0% 1.0 50.0% 5.1 40.0% 4.1 TFS 3.7 Yalama 1.0 5.1 10.0% 0.5 70.0% 3.6 20.0% 1.0 TFS	3.5	oen	Samukh ARC	2.0	10.2	10.0%	1.0	70.0%	7.1	20.0%	2.0	TFS	
3.7 Yalama 1.0 5.1 10.0% 0.5 70.0% 3.6 20.0% 1.0 TES	3.6	Bi	Absheron	1.0	10.2	10.0%	1.0	50.0%	5.1	40.0%	4.1	TFS	
	3.7		Yalama	1.0	5.1	10.0%	0.5	70.0%	3.6	20.0%	1.0	TFS	

Total economic and technical indicators of 420 MW ARES Capacity

Indicators	Unit	
Total cost of the project, million AZN	1,153.4	
The cost of 1 MW installed capacity, million AZN	2.7	
Average annual net production, million kWh	1,192.5	
Capacity factor	0.33	
Annual operation and maintenance costs, million AZN	10.4	
Operation and maintenance costs per kWh of energy production, kopecks	4.7	
Natural gas released by RE electricity generation, million cubic meters		
during 1 year	303.3	
during 25 year	7,583.7	
The number of new temporary jobs	3,179	
The number of new permanent jobs	270	
Wholesale tariff of 1 kWh of electricity, kopecks	Current tariff	scenario
Wind PP	5,5	9,0
Solar DD	57	0 0

Wholesale tariff of 1 kWh of electricity, kopecks	tariff	scenario 1	scenario 2	scenario 3*
Wind PP	5,5	9,0	11,0	14,1
Solar PP	5,7	9,0	11,0	13,4
Bio PP	5,7	9,0	11,0	14,4
Sales price of 1 kWh of electricity, kopecks	73,5	114,8	138,6	175,6
Cash flow from the sale of electricity during the year (on average)				
Project payback period, year	20,6	12,5	10,2	7,9
excluding discount	39,4	23,9	19,5	15,1
* Inclusive of current tariffs of energy by source and earnings from the export of natural ga	as saved			



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Technological development



"Azguntex" LLC was built in Sumgait
Production capacity of the first line:
100 000 modules/year (25 MW)
Production capacity of the second line:
200 000 modules/year (50 MW)



Polycrystalline modules: •The number of PV cells - 60 •Capacity - 36 V 250 W •Size –997mm/1663mm •Weight – 20 kg

Was put into operation : 24.04.2012



*Investment Promotion Document (IPD)

Exemption from income (profits) tax of 50% of the income (profit) of persons who have received an IPD.

Exemption from VAT on hardware, technological equipment and structures imported by persons who have received an IPD.

Exemption from assets tax and land tax for persons who have received an IPD. Exemption from customs duties of hardware, technological equipment and structures imported by persons involved in investment activities.

All of the above benefits are restricted to 7 years of the date of the issuance of the IPD..





Challenges in RE development in Azerbaijan

• Technical challenges:

- problems with technology transfer;
- Financial challenges:
 - lack of financial resources;
 - high level of interest rate;
 - Tariffs
- Other challenges:
 - lack of international organizations support in awareness sphere.





Thank you for your attention!

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