



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

Overview of the renewable energy developments in Azerbaijan

Jabir Yusifov
Head of the Department

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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).

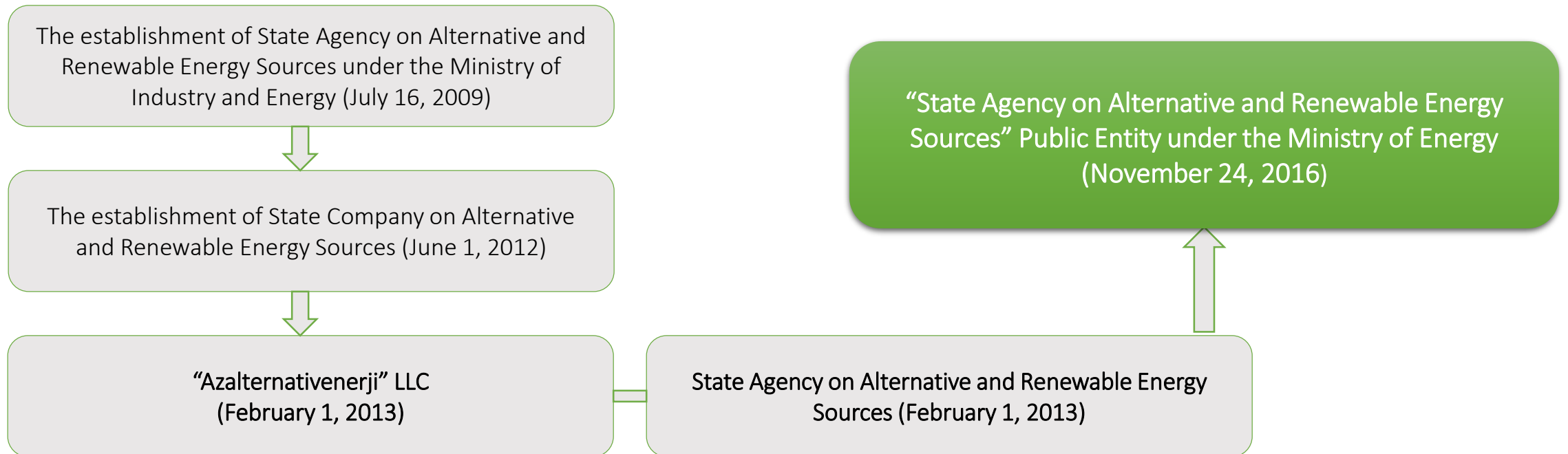
Current status of RE development in Azerbaijan

Strategic support of developing RE:

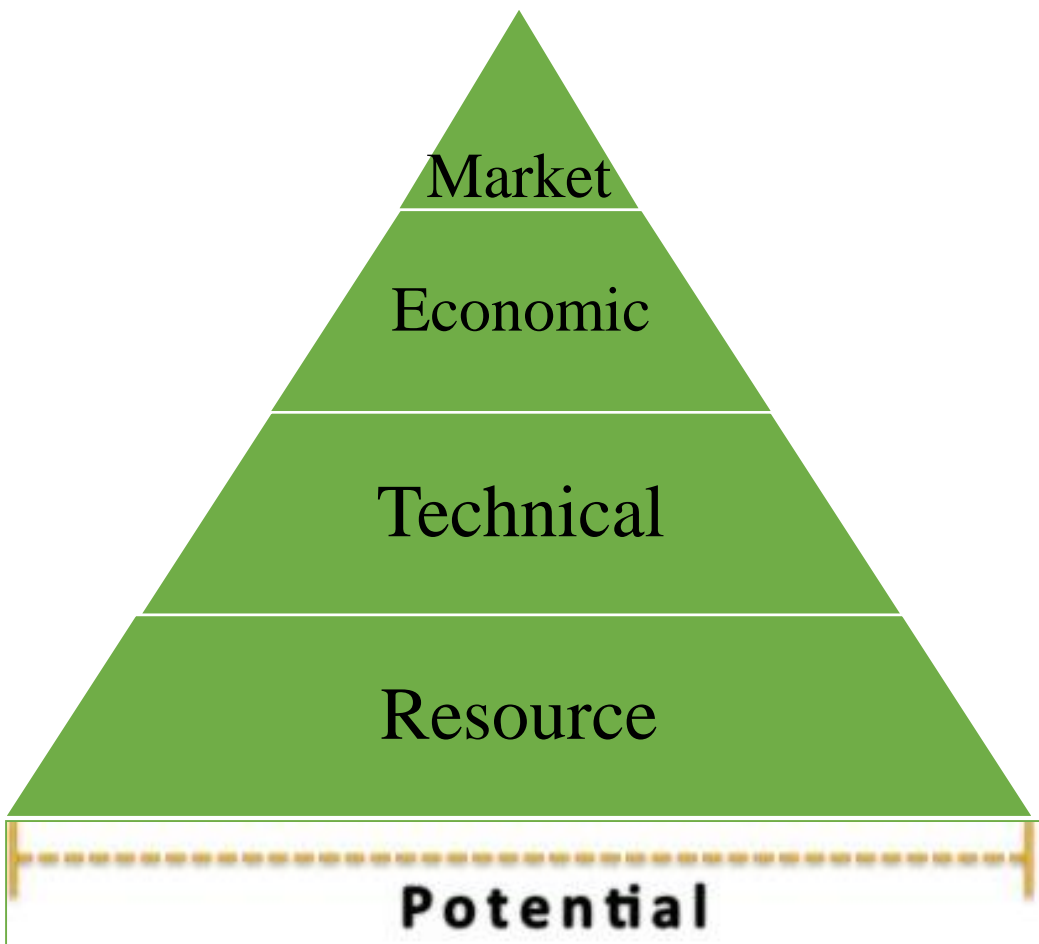
- The State Program on Use of Alternative and Renewable Energy Sources in Azerbaijan Republic (2004);
- Order of President of the Republic of Azerbaijan "On the development of the State Strategy on use of alternative and renewable energy sources in the Republic of Azerbaijan for 2012-2020";
- Decree 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)



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Types of renewable energy potential



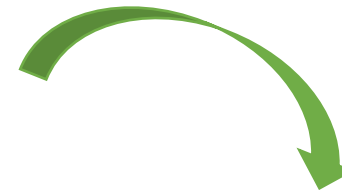
Types of renewables	Resource potential (MW)	Technical potential (MW)	Economic potential (MW)
Wind	84 262	> 15000	3000
Solar	4 300 143	> 115200	23040el/5000th
Biomass: -cotton stalk(1 mln t) -Wheat straw(1,4 mln t) -biogas - Waste (2 mln t)	552 576 280 200	> 900	380el/760th
Hydro energy (small rivers)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

Three-stage energy model of RES development

**1 house –
1 power plant**



**Regional hybrid
power plants**



**Industrial
power stations**

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



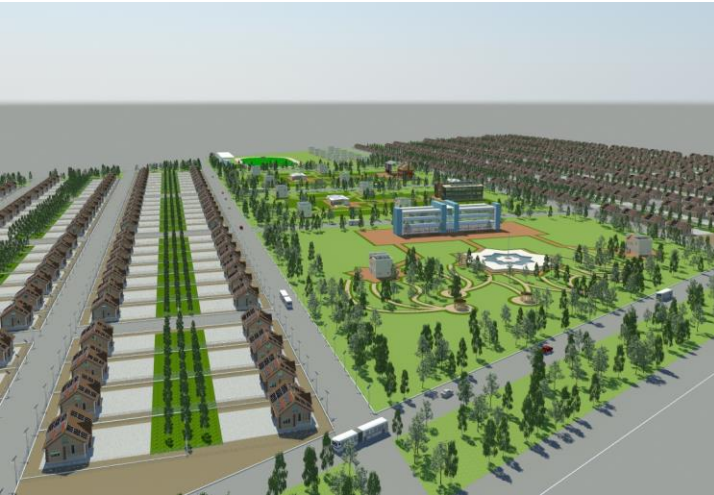
Gobustan Experimental Polygon and Training Center

- 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	“CNiM” 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 of December 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.

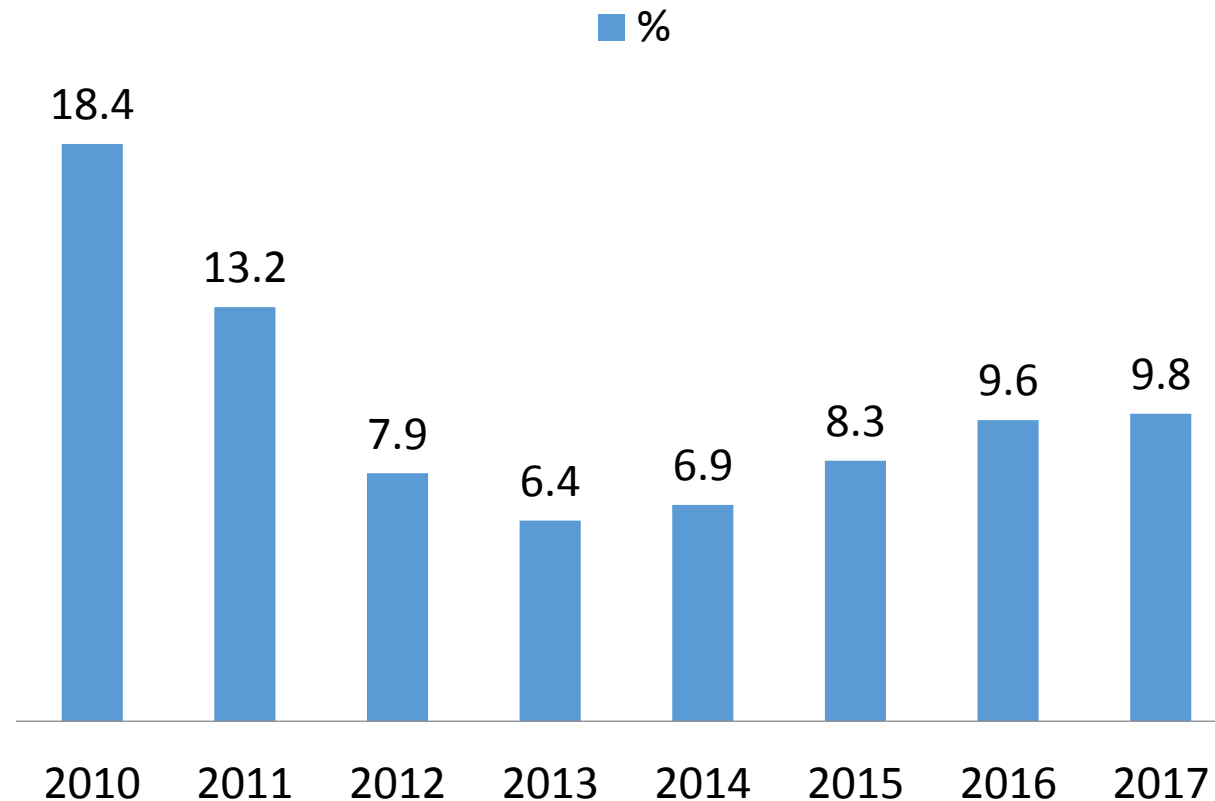
Key Performance Indicators:

- 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	%
The total generation capacity	7550	100
Installed generating capacity of renewable energy	1268	16,9
including:		
Hydroelectric Power Plants	1133	89
Wind	66	5,2
Solar	29	2,2
Biomass & waste	38	2,9



Power installation up to 2030

	2020	2025	2030
• Wind PP	350 MVt	440 MVt	465 MVt
• Solar PP	50 MVt	150 MVt	190 MVt
• Hidro PP	-----	220 MVt	220 MVt
• Bioenergy PP	20 MVt	30 MVt	50 MVt
• Total (MW)	420 MVt	840 MVt	925 MVt
• Total (RES %)	20 %	25-30 %	35-40 %

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, MW	Required investments for 2018-2020, mln. manats	including:						Current status of the Project
					2018		2019		2020		
					%	million manats	%	million manats	%	million manats	
		TOTAL	420.0	1153.4	37.6%	434.1	44.5%	513.0	17.9%	206.3	
1	Wind Energy Plants	Wind Power Plants - total	350.0	944.1	36.5%	345.0	44.5%	419.9	19.0%	179.2	
1.1		Khızı-1 (Shurabad)	56.1	134.5	100.0%	134.5					Project continuation
1.2		Khızı-2 HES (wind component)	69.0	190.1	70.0%	133.1	30.0%	57.0			TFS
1.3		Khızı-3	135.0	371.9	10.0%	37.2	60.0%	223.1	30.0%	111.6	Draft TFS
1.4		Absheron HES (wind component)	55.2	152.1	10.0%	15.2	60.0%	91.2	30.0%	45.6	TFS
1.5		Lokbatan	26.7	73.6	10.0%	7.4	60.0%	44.1	30.0%	22.1	TFS
1.6		Gobustan HES (wind component)	8.0	22.0	80.0%	17.6	20.0%	4.4			Project continuation
2	Solar Energy Plants	Solar power plant - total	50.0	107.2	66.5%	71.3	33.5%	35.9	0.0%	0.0	
2.1		Surakhani	1.7	7.7	100.0%	7.7					Project continuation
2.2		Sumgayıt	1.8	7.7	100.0%	7.7					Project continuation
2.3		Pirallahi-1	2.2	5.5	100.0%	5.5					Project continuation
2.4		Pirallahi-2	7.2	11.6	100.0%	11.6					TFS, typical project
2.5		Samukh-1	0.4	12.3	100.0%	12.3					Project contuniation
2.6		Samukh-2	7.2	1.7	100.0%	1.7					TFS, typical project
2.7		Gobustan HES (solar component)	5.0	12.3	100.0%	12.3					TFS, typical project
2.8		Khızı-2 HES (solar component)	10.0	8.5	100.0%	8.5					TFS
2.9		Absheron HES (solar component)	10.0	17.1	10.0%	1.7	90.0%	15.3			TFS
2.10		Siyazan	4.5	17.1	10.0%	1.7	90.0%	15.3			TFS, typical project
3	Bioenergy Plants	Bioenergy plants - total	20.0	5.8	10.0%	0.6	90.0%	5.2			
3.1		Agjabedi	8.0	102.0	17.5%	17.9	56.0%	57.1	26.5%	27.0	TFS, typical project
3.2		Siazan	3.0	40.8	10.0%	4.1	60.0%	24.5	30.0%	12.2	TFS
3.3		Hovsan Aeration	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	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				
		Current tariff	scenario 1	scenario 2	scenario 3*
Wholesale tariff of 1 kWh of electricity, kopecks					
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 gas saved

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

Stimulation of investment climate

*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!

AZ1000, Azerbaijan, Baku, 80 U.Hajibayov str., Government House

Tel.: (+99412) 488 01 34 (170)

Fax: (+99412) 493 16 97

E-mail: info@area.gov.az

Web: www.area.gov.az