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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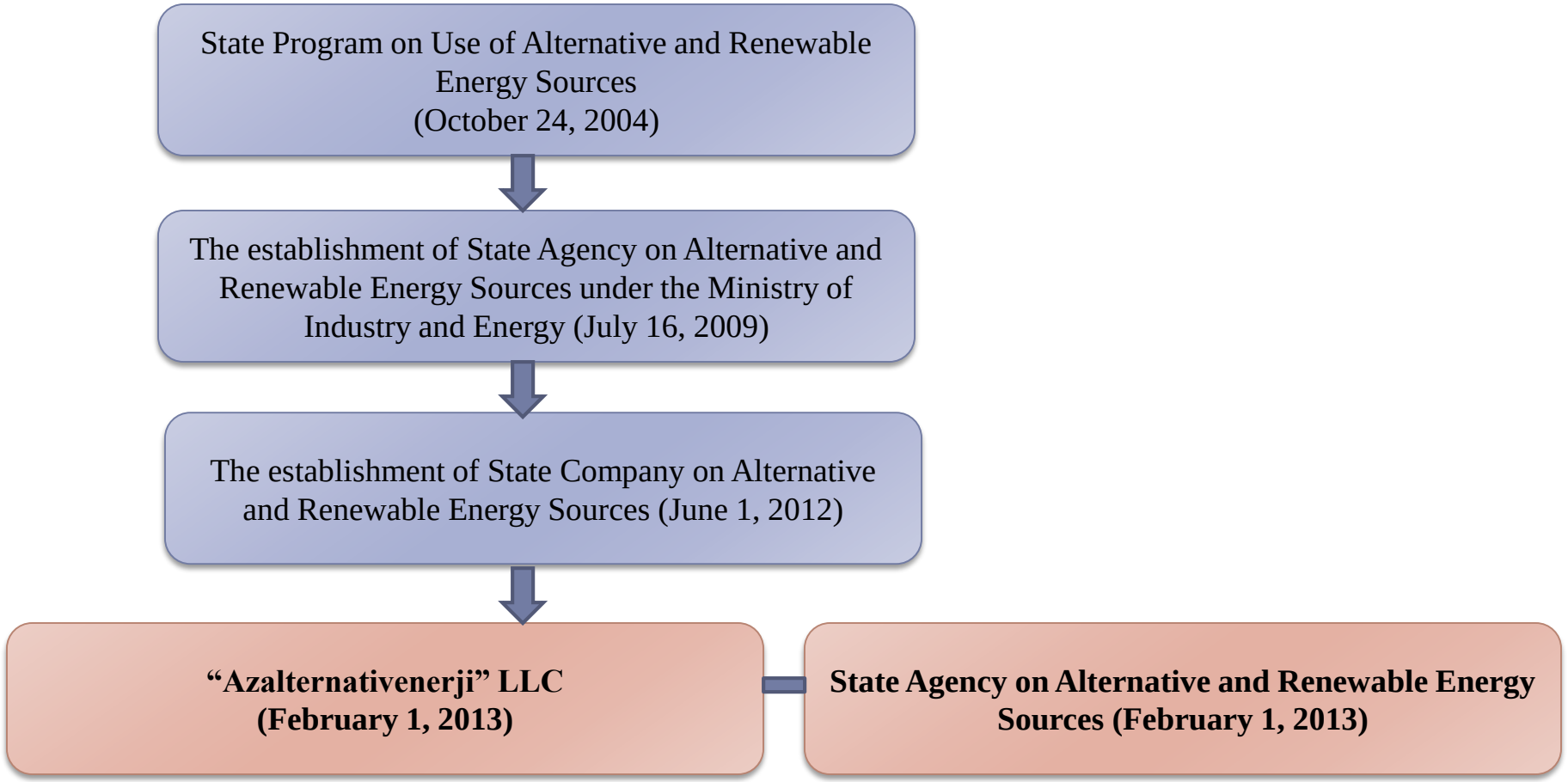
Current status of RE development in Azerbaijan

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).

Background of the Agency



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)*

Technical potential of RES in Azerbaijan

Type of RSE	Capacity, MWt/bln.kVts
Solar Energy	>115200
Wind Energy	>15000
Bioenergy	>900
Geothermal Energy	>200
Small Hydro	>650
TOTAL:	>130000

The classification of the AREA projects

- “1 house – 1 Power Plant”
- Region hybrid power plants
- Industrial-type power plans

Region hybrid power plants

Gobustan Experimental Polygon and Training Center

- Total capacity – 5.5 MW

- Wind PP – 2.7 MW
- Solar PP – 1.8 MW (additional capacity is being installed)
- Biogas PP – 1 MW

Was put into operation in 2011

Region 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) was put into operation in 2014
- Project period: 2014-2020

Industrial-type power plans

- Nakhchivan PV – 20 MW, was put into operation in 2014

- Yeni Yashma Wind Farm – 50 MW

- “Wind Island – 1” Offshore Wind Farm – 200MW

Industrial-type power plans

- Pirallahy Solar Power Plant
- Installed capacity: 2.8 MVt

- Surakhany Solar Power Plant
- Installed capacity: 2.8 MVt

Sumgayıt SPP

- Installed capacity: 2.8 MVt

Industrial-type power plans

- Sitalchay Wind farm
- Installed capacity : 3.6 MW

- Hökumali Wind farm
- Installed capacity : 8.0 MW

- Yeni Yaşma 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 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.

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	10 MVt	220 MVt	220 MVt
• Bioenergy PP	20 MVt	30 MVt	50 MVt
• Total (MW)	430 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

Wholesale tariff of 1 kWh of electricity, kopecks	Current 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 gas saved

Developing of renewable energy sector of economy

- Solar PV (50 MW) Plant
- Solar Collector Plant

Was installed 275 MW renewable power stations (for 2009-2017)

- Hydro – 137 MW
- Wind - 66 MW
- Solar – 35 MW
- Biomass & waste - 37 MW

Sample Summary on Technology Parks

Was approved by the Decree of President of the Republic of Azerbaijan dated May 15, 2014

- Exemption from payment of income tax for 7 years;

- Exemption from land tax for 7 years;

- Exemption from payment of property tax for 7 years;

- Release of the art technological equipment and devices imported into the country in order to create industrial area in the industrial park, from the VAT for 7 years.

Results

- Sumgait Technologies Park (STP)

(STP has been launched by the President of Azerbaijan Ilham Aliyev on 22nd of December 2009.

- Sumgait Chemical İndustrial Park (was start to build in 03.10.2013);
- Balakhanı and Pirallahi İndustrial Park are building;

Challenges in RE development in Azerbaijan

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

Thank you for your attention!

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