

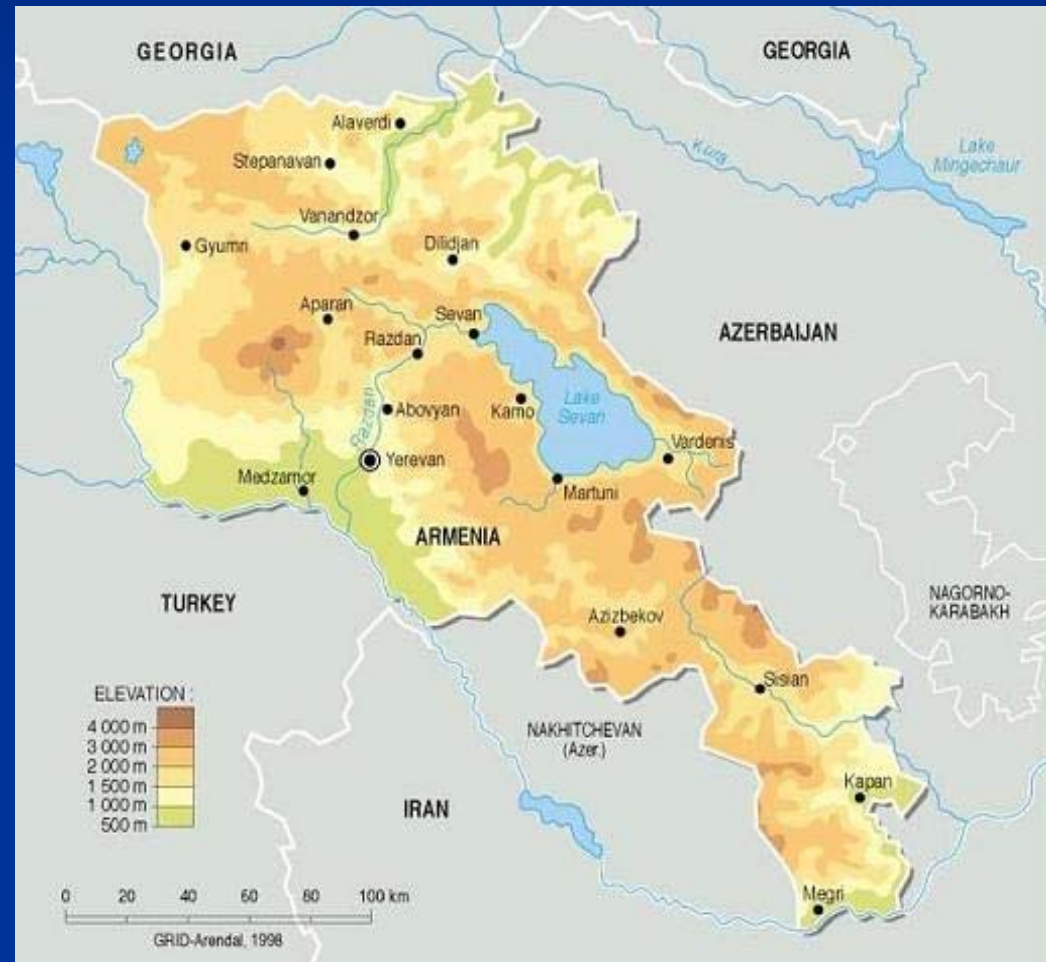
THE REPUBLIC OF ARMENIA



06-26 May, 2012 – Tokyo, JAPAN

Structure of the Presentation

- 1. Armenia in Brief
- 2. National Energy Strategy
- 3. Armenian Energy Sector Overview
- 4. Renewable Energy
- 5. Conclusion



Armenia in Brief

Country at a Glance:

Official Name:	Republic of Armenia
Head of State:	President Serzh Sargsyan
Capital:	Yerevan
Area:	29,800 sq. kilometers
Population:	3,3 mln
Currency:	Dram



Geography

Armenia is the smallest of the Caucasus countries, which is bordered by Georgia in north, Azerbaijan in west and southwest, Turkey and Iran in east and south consequently.



Republic of Armenia

The Republic of Armenia is situated in the southern part of the Caucasus between watersheds of middle streams of the Araks and Kura Rivers. The territory of the Republic is 29.8 thousand sq. kilometers. It occupies the southeastern part of a vast highland area known as the Armenian Upland, which is located within the Alpine-Himalayan mountain system. The Armenian landscape is very picturesque and rich in numerous cultural monuments, such as rock drawings, cave towns, excavations of ancient cities and Paleolithic settlements, remnants of the most ancient observatories and metallurgical centers, creations of old and Medieval Armenian masters (temples, cloisters and fortresses) and modern architectural ensembles. This is all reflected in various guidebooks for the numerous tourists who visit Armenia. Armenia has every reason to be considered a museum in the open air.



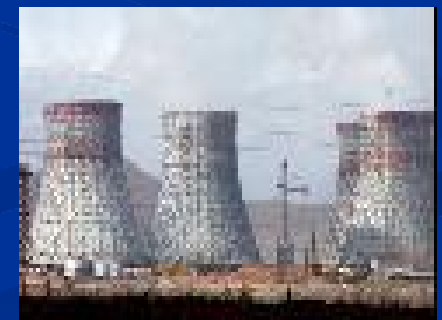
2. The following four Pillars are identified in National Energy Strategy:

- development of nuclear energy
- full and sound utilization of renewable energy sources, improving of energy efficiency
- diversification of primary energy resources and import/export routs
- regional integration and cooperation.

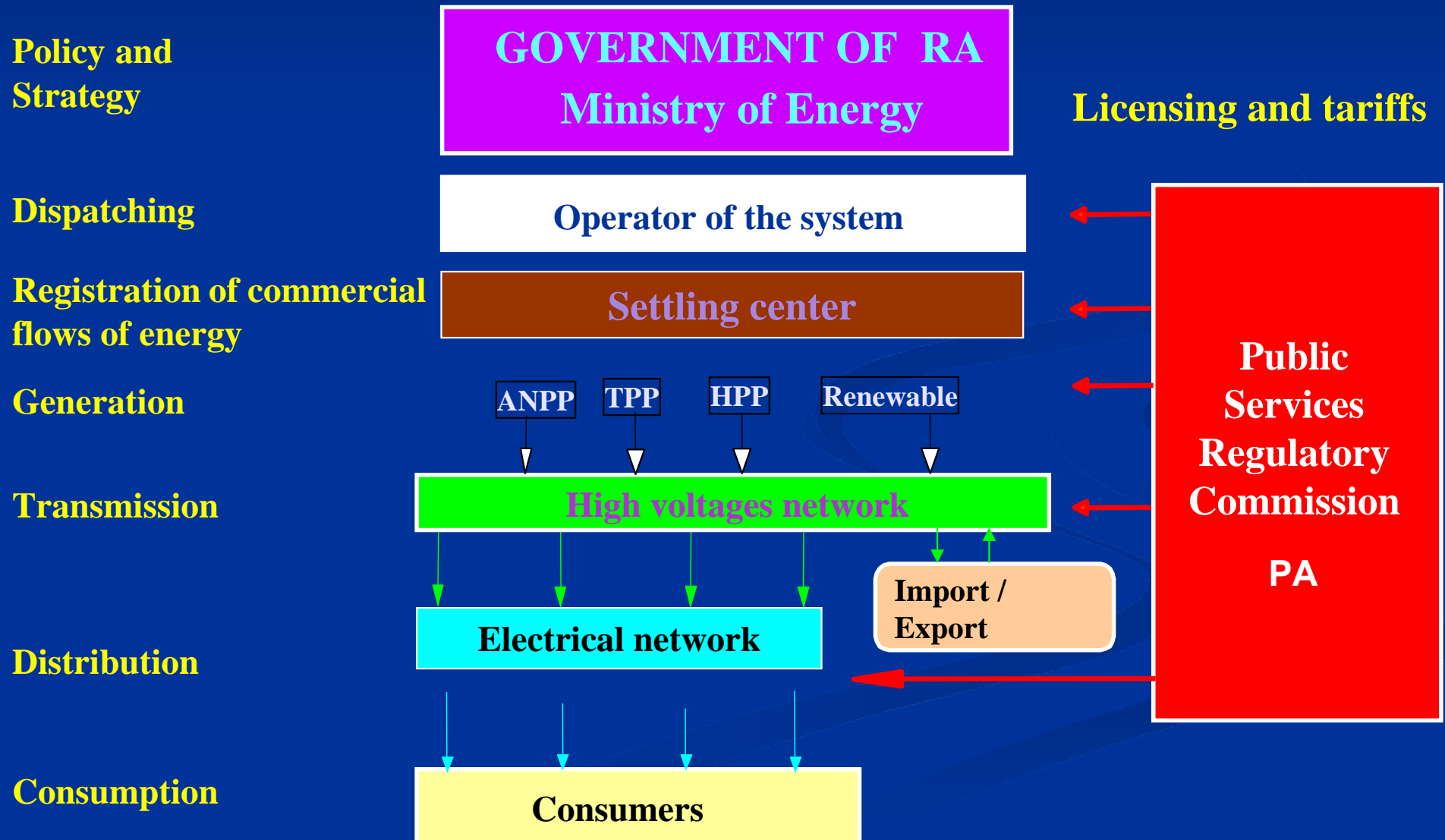
The Energy Strategy of Armenia aims at the resolution of the following primary problems

- Providing reliable energy supply at low rates to satisfy the fundamental needs of all customers, while enhancing energy conservation, input of energy efficient technologies in all branches of economy;
- Avoiding methods of importing the primary sources that might expose the security and economy of Armenia to events political impacts beyond the control of the Republic of Armenia;
- Ensuring the safe operation of the ANPP to time as its energy can be replaced with new nuclear unit and decommissioning can proceed without unacceptable economic and energy security impacts;
- Ensuring sustainable energy supply, based on the principles of sustainable development and in compliance with the international environmental commitments of the Republic of Armenia;
- Creation of an electric energy system that is export oriented and generates high added value.

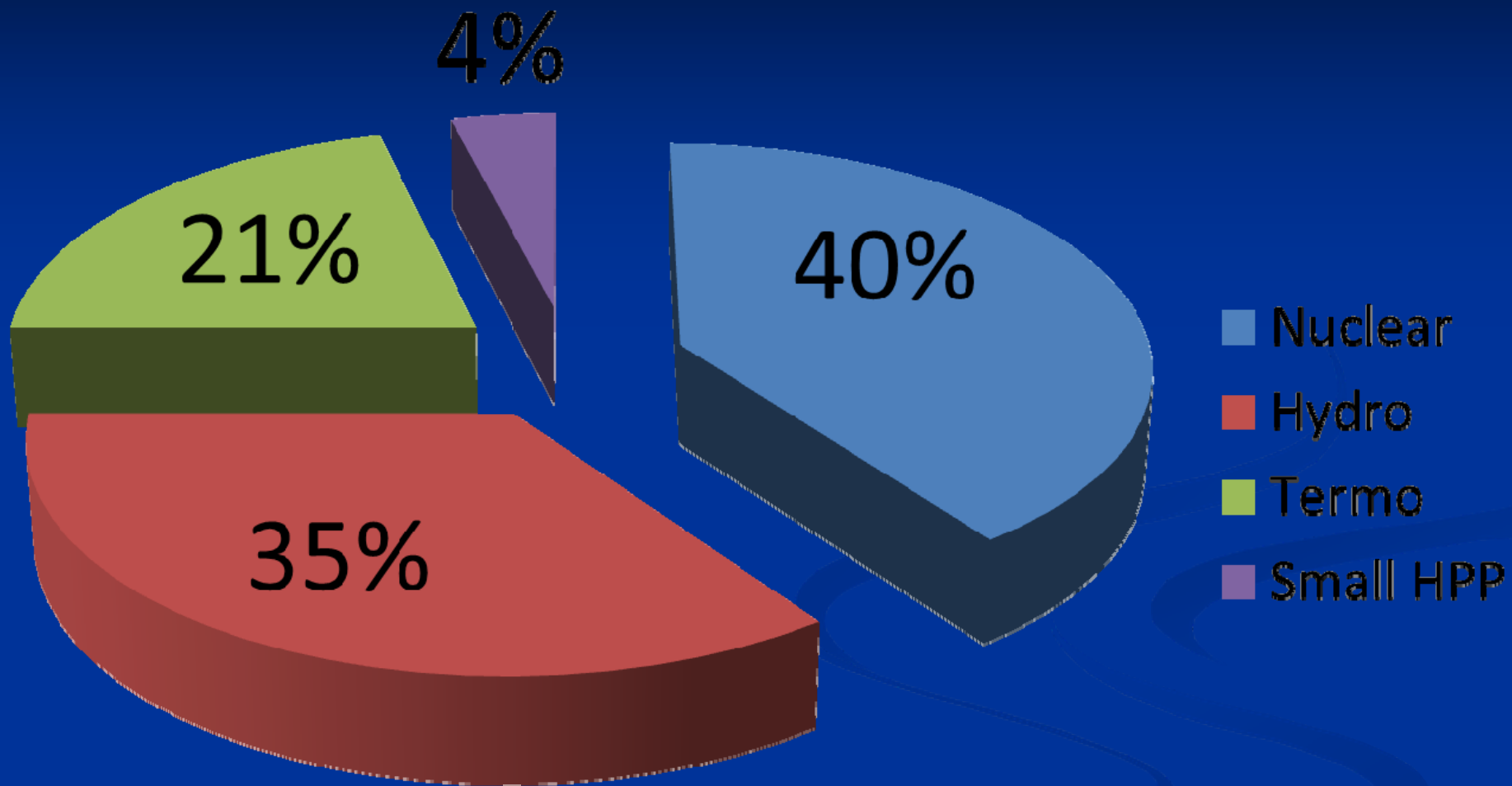
3. POWER SECTOR OVERVIEW



Functional Structure of Armenian Energy system



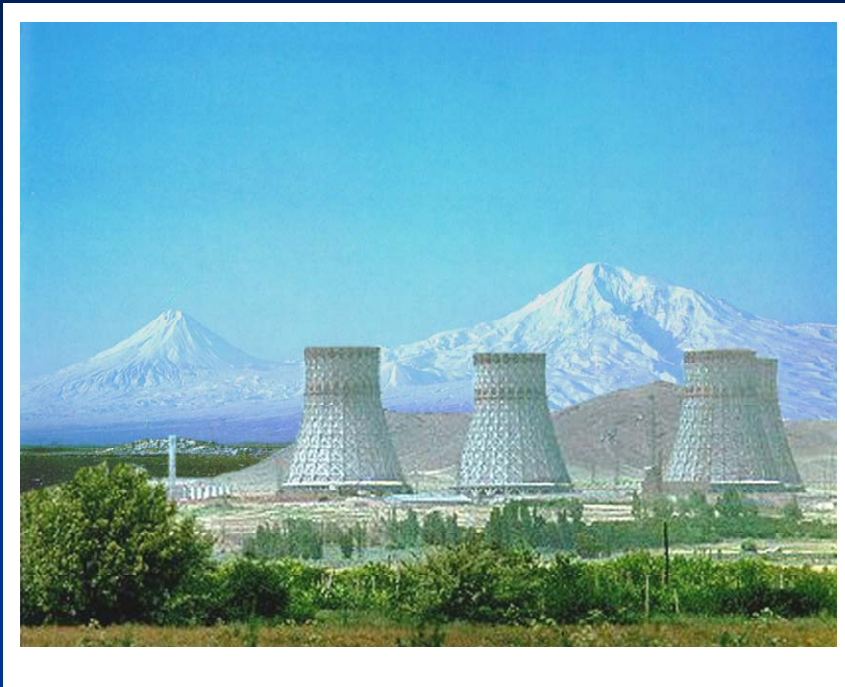
POWER SECTOR



Currently the energy sector of Armenia is one of the full operational and cost-effective branches of the country's economy. Armenia fully covers energy demand in the internal market and exports electricity to Georgia, as well as successfully performs an electricity exchange with Iran on mutually beneficial basis. The installed capacity of the power system of Armenia is with surplus and is equal to 3238 MW.

1.	<i>Installed Capacities</i>	
	<i>ANPP</i>	408 MW (2nd unit)
	Thermal Power Plants	1888MW
	Hydro Power Plants	956 MW
	Small HPPs	160 MW
	Wind Farm	2,6 MW
2.	<i>Transmission system</i>	
	220 kV	14 substations
	110 kV	119 substations
3.	<i>Distribution system</i>	
	35 kV	278 substations
	6(10) kV	
	0.4 kV	

Nuclear Power



Armenian Nuclear
Power Plant

According to the National Security Strategy of RA development of the nuclear energy will insure greater energy independence of Armenia

It is foreseen to construct the 1200 MW new unit of nuclear plant up to 2019

Yerevan Combined Cycle Co-Generation Power Plant

SSEO@GSCONST.CO.KR



Existing international transmission lines

Country	Name of substation	kV
Azerbaijan	Hrazdan HPP – Akstafa	330
Azerbaijan (Nakhichevan)	Ararat-2 – Babek	220
	Ararat-2 – Norashen	110
	Agarak – Ordubad	110
Georgia	Alaverdi – Tbilisi TPP	220
	Alaverdi 2/Lalvar – Sadakhlo	110
	Ashotsk – Ninotsminda	110
Iran I, Iran II	Shinuair – Agarak	220
Turkey	Gumri – Kars	220

It is foreseen to construct the

- Armenia-Georgia 400 kV overhead line in 2013,
- Iran-Armenia 400 kV overhead line in 2013.

4. Renewable Energy



- Hydro energy
- Wind Energy
- Solar Energy
- Geothermal Energy
- Biomass Energy

Hydro energy



Existing HPPs in Armenia

■ Sevan-Hrazdan HPPs Cascade:
556MW / 2320 million kWh

■ Vorotan HPPs Cascade:
404MW / 1157 million kWh

■ Dzora HPP:
25MW / 90 million kWh

It is foreseen to construct the following HPPs

HPP

On Araks River

Meghri HPP /about 140 MW capacity and around 800 million kWh annual electricity generation/

On Debet River

Shnogh HPP /about 75 MW capacity and 300 million kWh annual electricity generation/

On Dzoraget River

Loriberd HPP / about 66 MW capacity –and around 200 million kWh annual electricity generation /

Small HPPs in Armenia

There are:

- 110 Existing SHPPs

132 MW / 429 million kWh

- 64 SHPPs under the construction

152 MW / 548 million kWh

Wind Energy

*The first wind power plant in
Armenia and in Caucasus*

- Lori-1 Wind Power Plant

2,6 MW / 5 million kWh



Solar Energy

- The average annual amount of solar energy flow per square meter of horizontal surface is about 1720 kWh/m²
(the average European is 1000 kWh/m²)
- One fourth of the country's territory is endowed with solar energy resources of 1850 kWh/m².

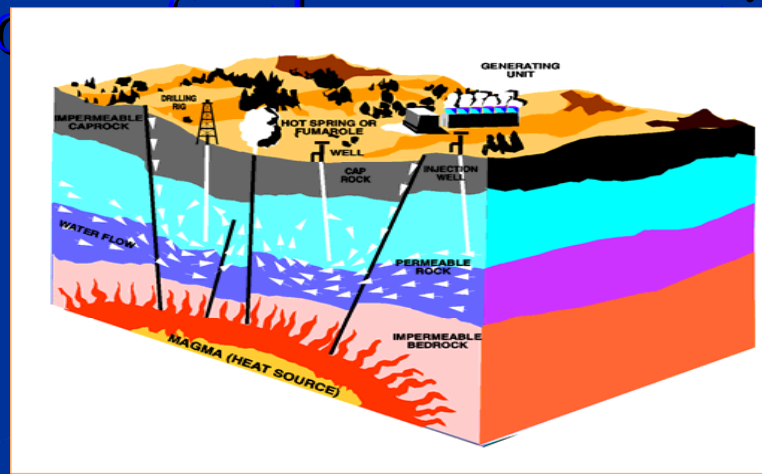


Geothermal Energy

Geothermal energy sources

- Projects under the development:
 - **Jermaghbyur:** 20-25 atmosphere pressure
250°C/2500-3000 meter in depth/25 MW
 - **Gridzor and Qarqar:** geological and geophysical explorations

- Investigation of geothermal energy sites



Biomass Energy

■ Biogas

Solid Waste Landfill Gas Capture and Power Generation CDM Project in Yerevan- 56000 t CO₂ emissions/1,4 MW

■ Bioethanol

Project development at the national level: Bioethanol Production, Potential Utilization and Perspectives in Armenia-7000-14000 t/annually



5. Conclusion

Utilization of some of the above mentioned measures will allow to maintain 30% of renewable energy production in Armenia, from the total, before 2025.





Thanks for attention and Welcome to ARMENIA

