

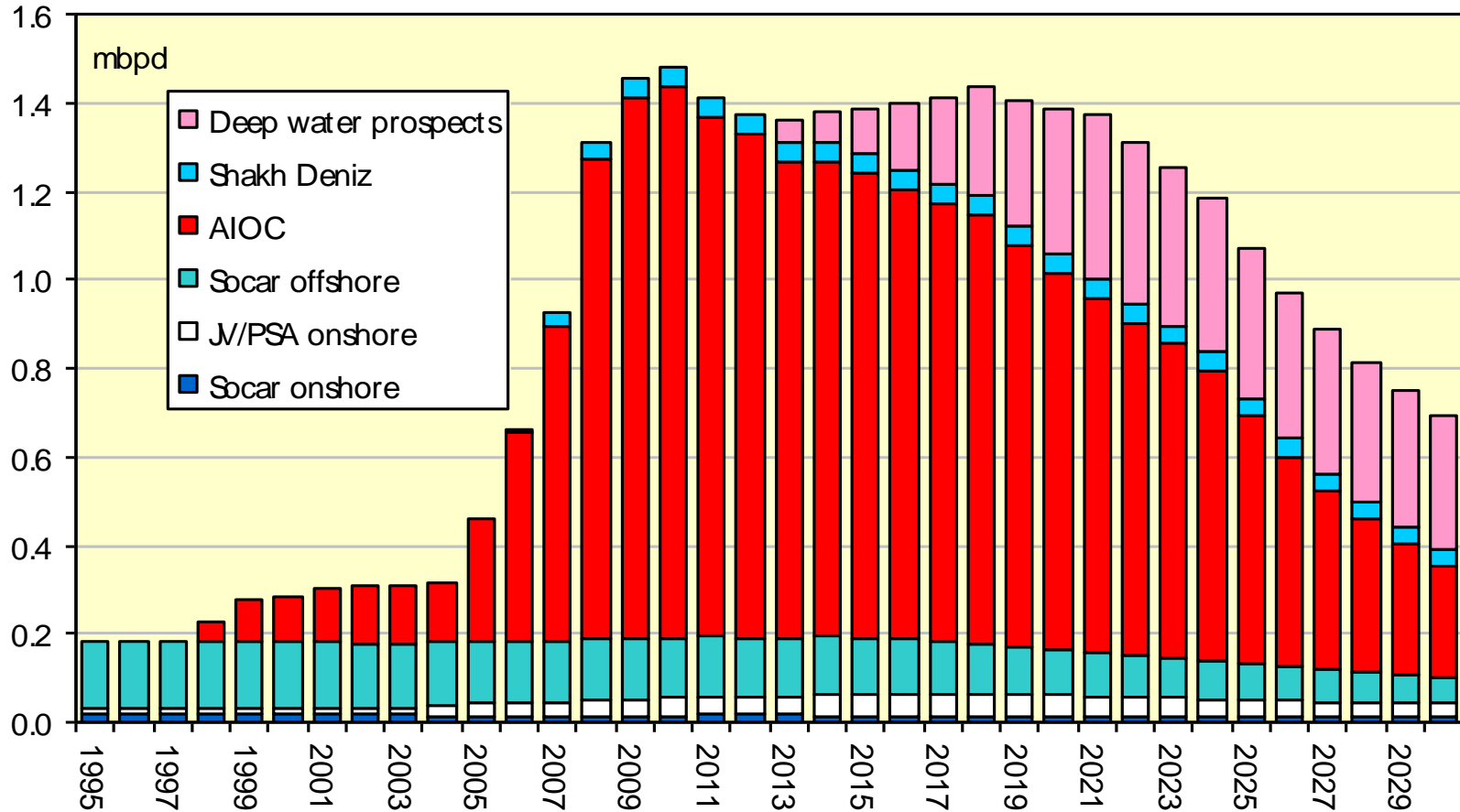
# **Green economy challenge in oil abundant country**

## **Azerbaijan case**

November 25, 2011  
Dr. Ingilab Ahmadov

# Azerbaijan outlook

## *Oil production outlook for Azerbaijan*

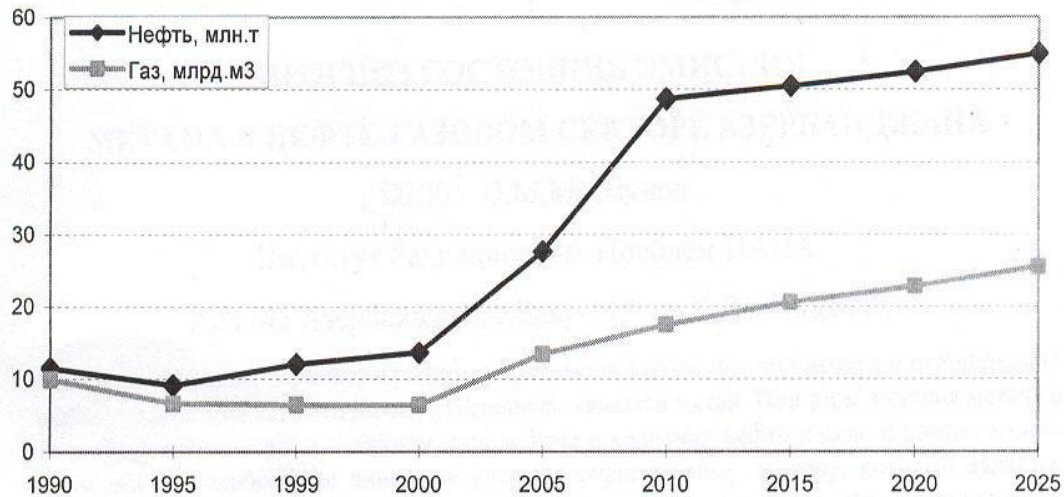




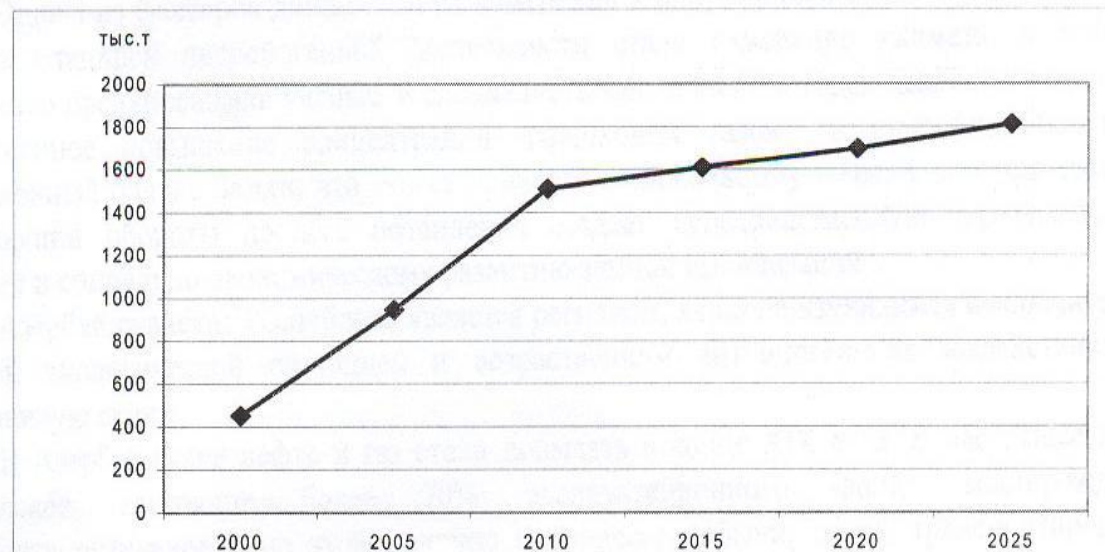
## **The Baku-Tbilisi-Ceyhan pipeline**

Dr.Ingilab Ahmadov

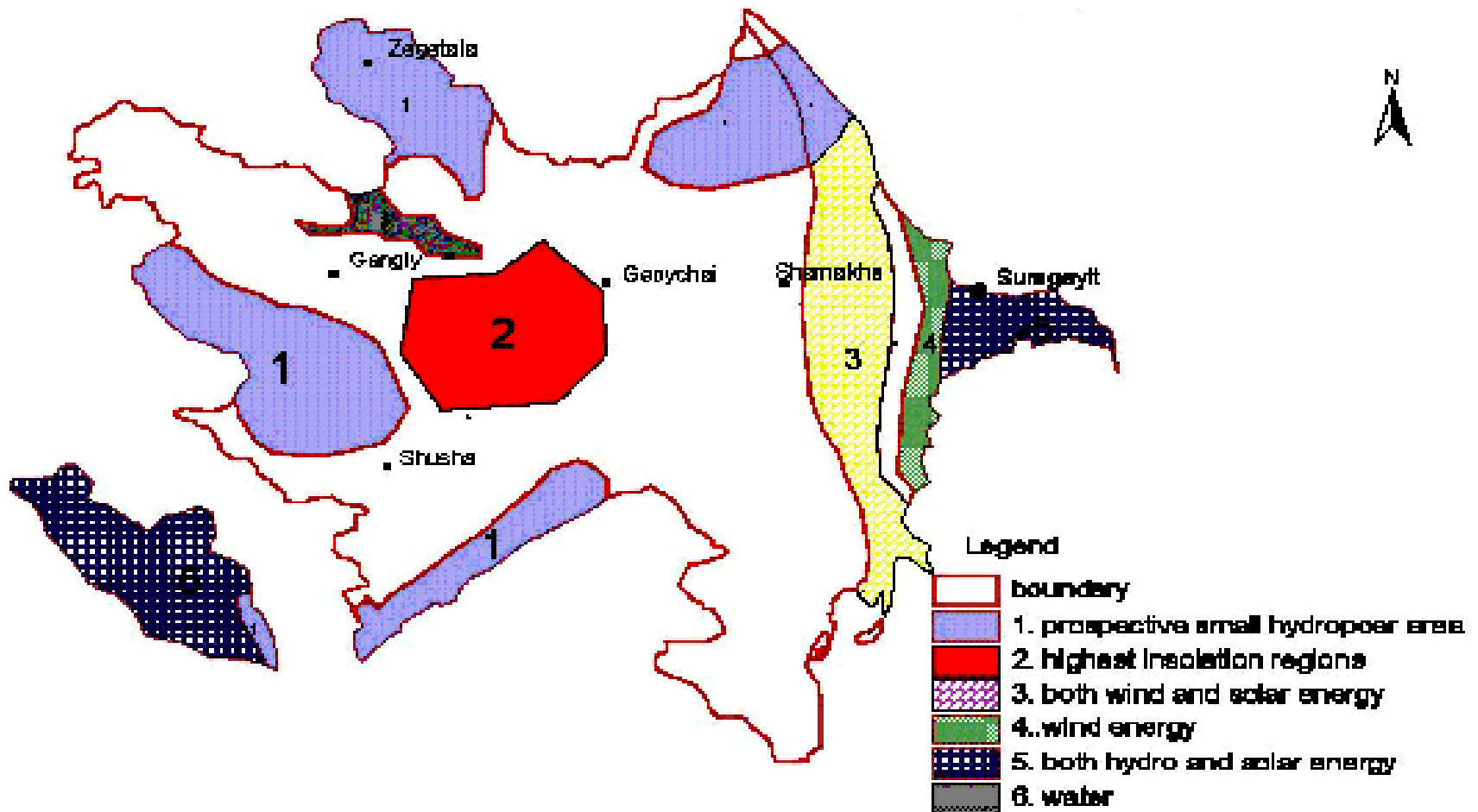
# Hydrocarbon production



# Methane emission



# The map of renewable energy resources of Azerbaijan

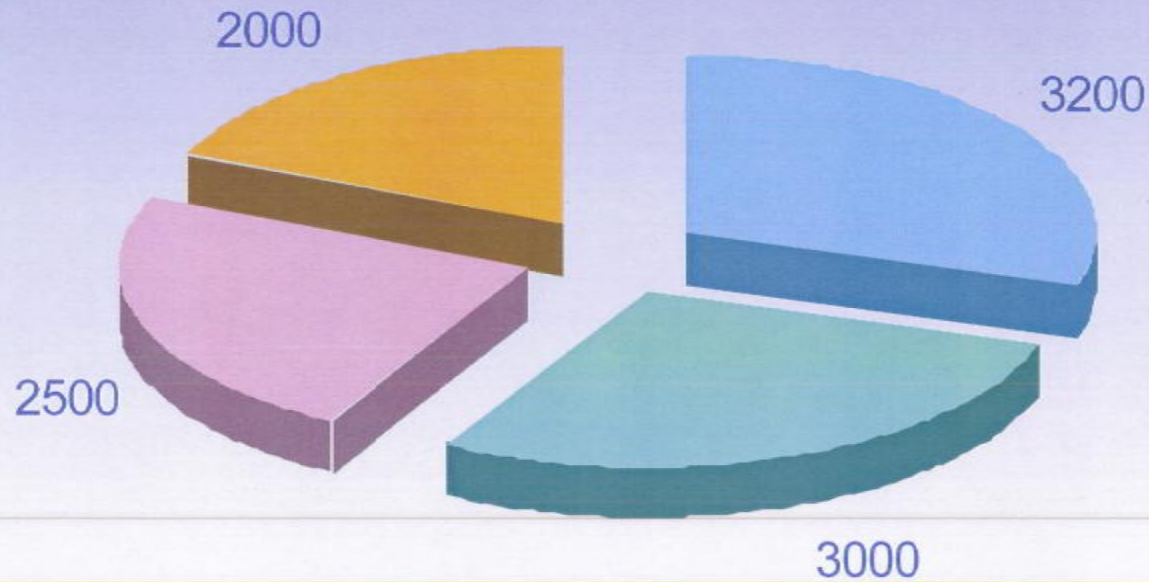


# Renewable energy resources of Azerbaijan

- The number of sunny days-250 per annum: changing from 2210 to 2700 hours and from 865 to 1000 hours in summer and winter periods, respectively. In some regions, the quantity of annual solar radiation is about 4.7 kVt.s/m<sup>2</sup>/day. The highest insolation has been observed in Absheron peninsula and Nakhchivan Autonomous Republic territory
- Wind energy reserve -up to 4 mln. kVt. helectricity
- Hydro energy potencial, including 5 billion kVt.h of small-hydro potential - up to 16 billion kVt.h
- Biomass potential -14.400 km of the republic's territory

# PERSPECTIVES OF ALTERNATIVE AND RENEWABLE ENERGY

## Sunny hours



■ Azerbaijan ■ Central Asia ■ USA ■ Russia



# PERSPECTIVES OF ALTERNATIVE AND RENEWABLE ENERGY

Solar energy amount for 1 sq.m area





# Country Strategic Goals in Renewable Energy Development: Target and Divisions

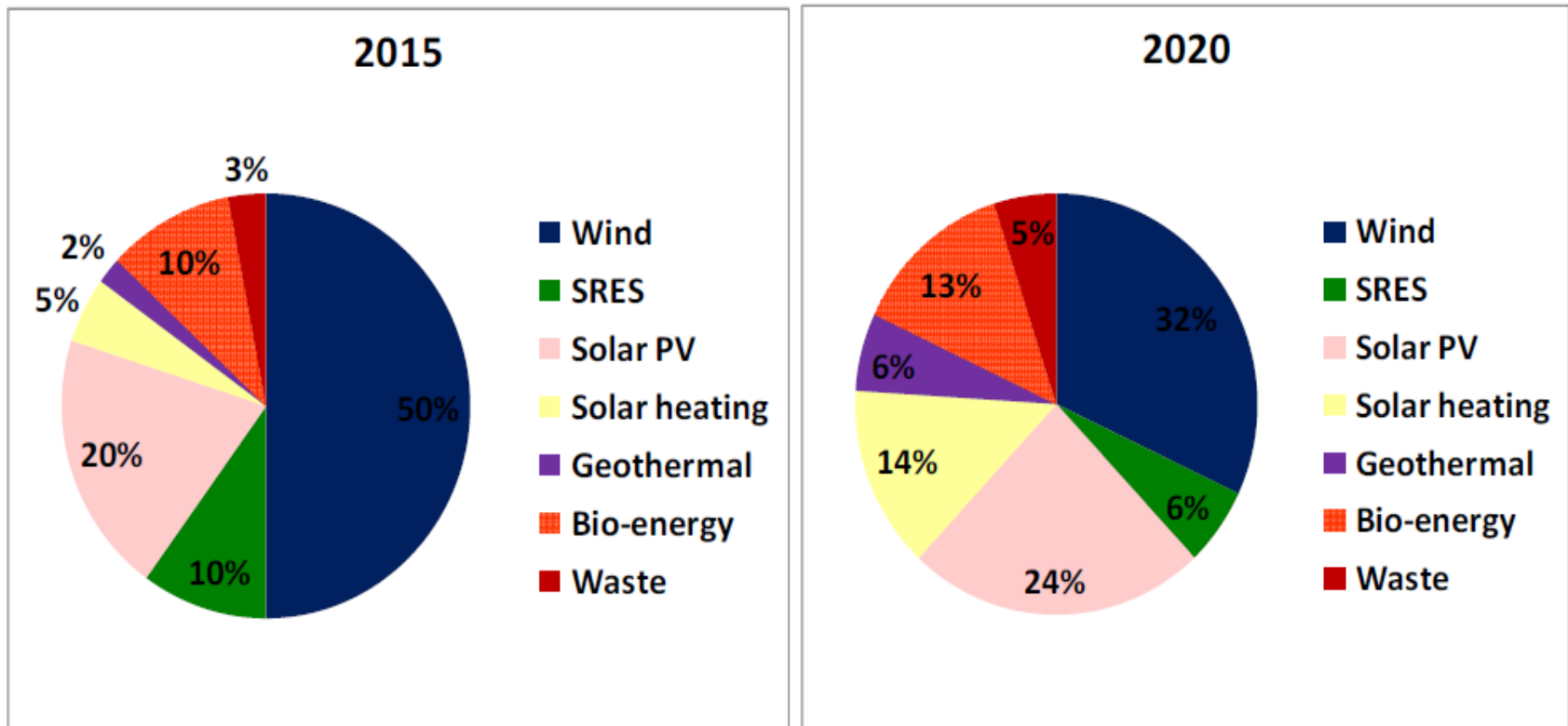


Figure 6: Strategic Goals for RES Development in Azerbaijan for 2015 and 2020, March 2011

Source: SAARES, arch 2011

# Most windy areas of Azerbaijan

- Apsheron peninsula
- Caspian Sea cost areas
- West of Azerbaijan (Ganja-Dashkasan region)
- Nakhchivan, Sharur-Julfa regions

# Perspectives of wind energy

- Annual wind energy reserve in Azerbaijan-800MWt;
- Or about 2.4 GWt/h per year;
- The saving will amount to 1million tons of conditional fuel per year

# Perspectives of alternative and renewable energy

## Working of wind turbines

- About 250 days per year is windy around Baku city.
- We need at least 2m/sec wind speed for the working of wind turbines.
- We need the minimum 3.6 m/sec wind speed for the production of electrical energy.

# Perspectives of alternative and renewable energy

## Solar Energy

### Advantages

- Harmless in ecological side;
- Technologically simple in using;
- Profitable .

# Perspectives of alternative and renewable energy

## Small hydropower plants

### Advantages

- Cheap technologies;
  - Ecologically clean technologies;
  - Conformability.
- 
- ✓ The part of water power plants production power in all electricity system of Azerbaijan is 17-18%
  - ✓ That is 11.4 % of all produced electrical energy in Azerbaijan
  - ✓ There is possibility to increase value of WPS 3-4 times



# Perspectives of alternative and renewable energy

## Hydropower potential of Azerbaijan

- Total hydropower potential of Azerbaijan 34 40 bln kwt/hour also:
- Technical suitable potential- 16.0 bln kwt/hour
- Small hydropower plants can produce 5.0 bln kwt/ hour

**Possible to save 850 000 tons of oil per year**

# Biomass Energy

## Biomass sources of Azerbaijan

- Flammable industrial waste;
- Forestry and woodworking waste;
- Agricultural and organic compounds' waste;
- Household and municipal waste;
- Waste received from areas polluted by oil and oil production

# Cooperation of Azerbaijan with international organizations on alternative energy

- Cooperation with *Europe Union* on alternative and renewable energy sources development;
- *Asian Development Bank* “Technical support of the Ministry of Industry and Energy of Azerbaijan in renewable energy resources development (small hydropower)”;
- “Technical support of Azerbaijan in development of renewable energy sources (wind energy and small hydropower)” *United Nations Development Programme*;

# Azerbaijan Natural Hazards



**Earthquake**



**Landslide**



**Mud Volcano**



**Sea-level rise**

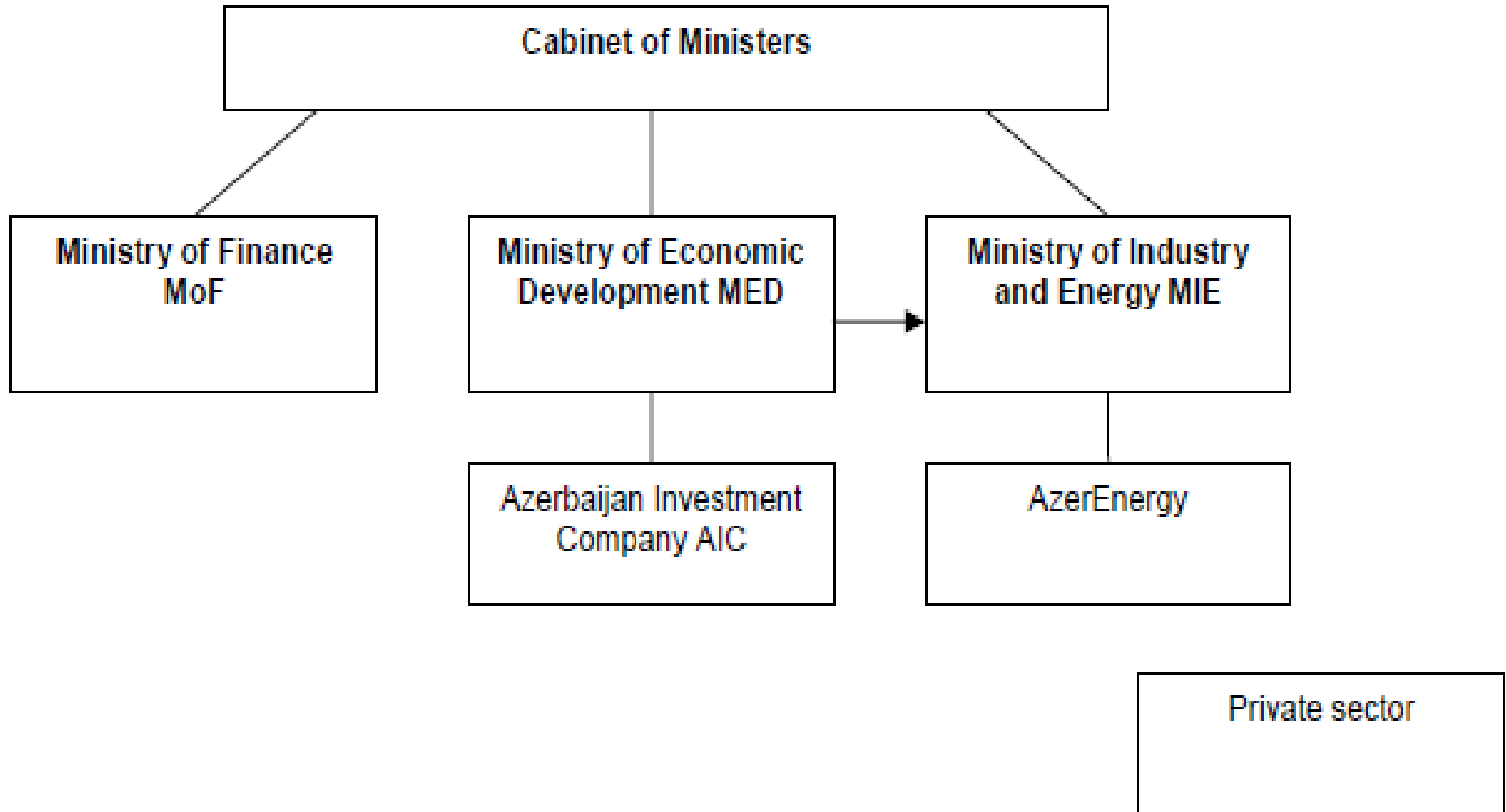


**Flooding**

# Hybrid alternative energy plant for mountainous Khinalig village



# Institutional Assessment





# The State Program on Use of Alternative and Renewable Energy Sources in Azerbaijan Republic (2005-2013)

## Goals of the program:

- To determine potential of alternative energy sources in the production of electrical power;
- To increase the efficiency of the usage of the energy sources of the country by using renewable energy sources;
- To open new work places by opening new energy production areas;
- To guarantee of energy security of the country by using of alternative energy sources.

# Barriers to development of alternative and renewable energy in Azerbaijan

- Legislative barriers
- Institutional barriers
- Financial barriers
- Public awareness

# Constraints for “green economy” and “green business” applications in Azerbaijan

- Legislative gaps and statistical problems
- Lack of environmental priority
- “Resource curse” and “Dutch disease” (to narrow FDI, crude dependence, lack of operative decision making, clashes of interest)
- Weak institutional coordination
- Sluggish technological transfers
- Lack of professionals on “energy economics” and “ecological economics ”
- Non adequate relations with relevant regional and global institutions (WB, IFC, EBRD, UNEP, IPCC)

# Opportunities for “green economy” and “green business” applications in Azerbaijan

- Government’s increased financial power to subsidy “green grants”
- Stable employment level and labor market to promote “green jobs”
- Favorable natural and geographical conditions
- Young and dynamic labor force
- Company lobbies don’t impact official decision making deeply
- Huge resources of civil society and mass media

*Thank you!*