

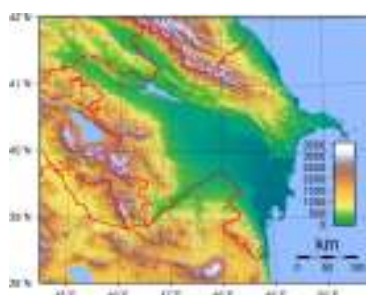
Developing green economy in the Republic of Azerbaijan:

The use of renewable energy resources

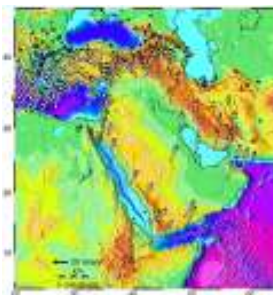
Prof. F. G. Aliyev
International Ecoenergy Academy



Azerbaijan



Located along the Caspian sea.
Total Area: 90,000 sq. km.
Major Geographic Units:
Caucasian Mountains
Kura Araz River Basin
Caspian Region (Absheron
Peninsula)



Geology :
Caucasus – Result of northwards
motion
of Arabian Plate.
Caspian – Remnant of ancient
Tethys Ocean.



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Azerbaijan and Global Economy

Energy production

Oil

Gas

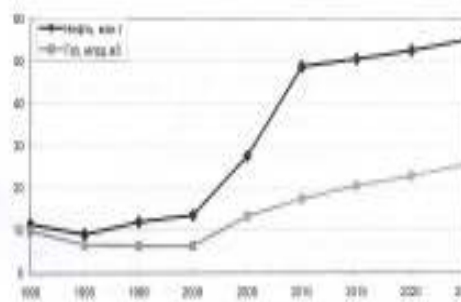
The Baku-Tbilisi-Ceyhan pipeline



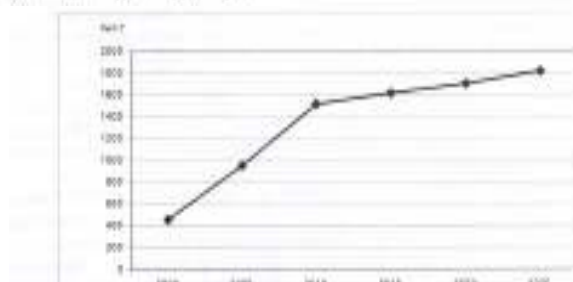
Hydrocarbon production



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Methane emission



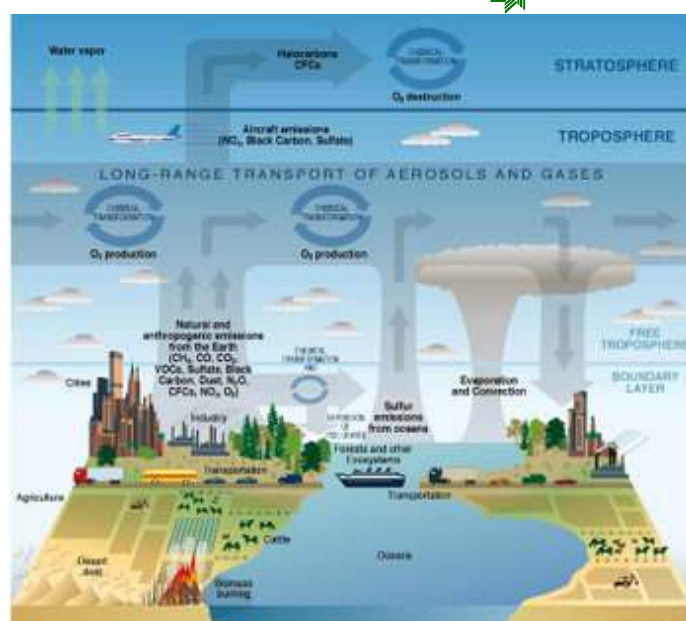


Consumption of fossil fuels has become a destructive force:

- Locally because of emissions, spills and leaks;
- Regionally because of pollutants dispersion;
- Globally because of carbon dioxide accumulation and threatening consequences- global warming, climate changes and sea level rise.

Main constituents of exhaust gases of automobiles:

- CO_2
- NO_x
- CO
- some hydrocarbons



Azerbaijan Natural Hazards



Earthquake



Landslide



Mud Volcano



Sea-level rise



Flooding



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IEA: Background Information

In 1990, with support from National Academy of Sciences and State Planning Committee of Azerbaijan Republic, the Scientific-Manufacturing Association "Gunesh" was established by a dedicated resolution of Cabinet of Ministers of Azerbaijan Republic. The mission of the Association was to promote the latest achievements of science and technology in effective utilization of conventional and renewable energy resources while protecting the environment and human health.

In 1994, the International Ecoenergy Academy (IEA) was founded on the basis of Scientific-Manufacturing Association "Gunesh".

The National Academy of Sciences of Azerbaijan Republic, Association "Gunesh", Clean Energy Research Institute of USA, Russian Academy of Architecture and Construction, Russian Association ABOK are the co-founders of the IEA.



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IEA: The main activity areas include:

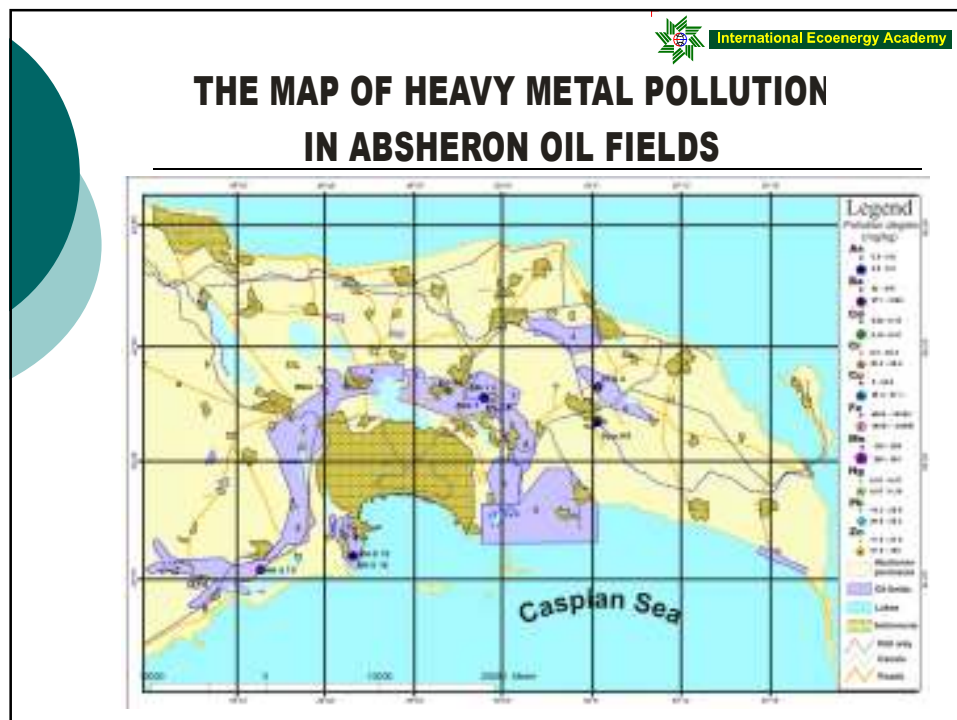
1. Research into fundamental problems of renewable and environmentally clean energy development and application
2. Research and monitoring of environmental impacts of oil field developments upon the ecosystem of Caspian Sea and Absheron peninsula, to ensure the sustainable development of the Caspian region
3. Research of environmental problems associated with contamination of the air, water and land resources caused by anthropogenous factors
4. Promotion of the development and application of modern environmental standards in partnership with relevant governmental agencies
5. Dissemination of knowledge on modern concepts of sustainability and achieving of ecological balance on the global scale, through organization of joint seminars and training courses in cooperation with national and international partners
6. Development and implementation of academic projects in the filed of environmental protection and energy security.



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ABSHERON OIL FIELDS INTERACTIVE MAP





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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/m²/day. The highest insolation has been observed in Absheron peninsula and Nakhchivan Autonomous Republic territory.
- Wind energy reserve - up to 4 mln. kVt.h electricity
- 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

Map of Azerbaijan's Renewable Energy Resources



IEA: The main projects developed and implemented:

- 1. Basics of Azerbaijan Energy Development for Period through 2010
- 2. Application of Solar Collectors in Power Supply
- 3. Feasibility Study of Wind-Electric Conversion Systems for Offshore Oil Platforms in Azerbaijan (in cooperation with Trento University, Italy)
- 4. Automated Energy Supply, Conditioning and Regular Microclimate Controlling Systems
- 5. Assessment of Radio-Ecological Situation in the Absheron Peninsula in Association with Oil&Gas Exploration and Production
- 6. Key Directions of National Scientific Programme "Radon" for 1998-2010 years
- 7. Remediation of the Absheron Oil Contaminated Soils
- 8. Development of a global network for the creation of eco-energy database in Azerbaijan



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- 9. Assessment and Monitoring of Toxico-Radio-Ecological Situation during Oil & Gas Fields' Development in the Caspian Contract Area
- 10. Ecotoxicological Regulation of Discharges to the Caspian Sea
- 11. Protection of Population from Harmful Impact of Radon and Radio-Nuclides
- 12. Assessment of Current Environmental Situation on Zyk-Govsany Oil Field in the Absheron Peninsula
- 13. "Air Quality Control in Azerbaijan" Project (in cooperation with DBG company, Germany)
- 14. Seismic Risk Study in Baku City (in cooperation with Japanese Kobe University)
- 15. "Hydro-Hydrogen Pilot Project for Guba-Khachmaz Region, Azerbaijan Republic" (in cooperation with UNIDO-ICHET)
- 16. Use of Hybrid Alternative Energy Systems in Mountainous Khinalig Village, Guba region, Azerbaijan

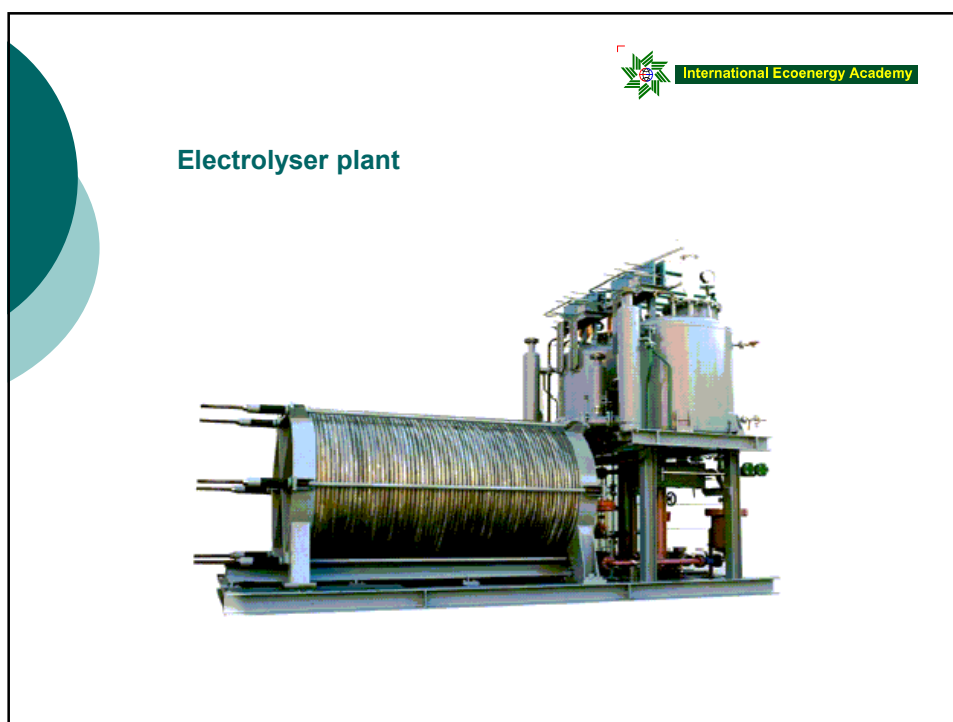
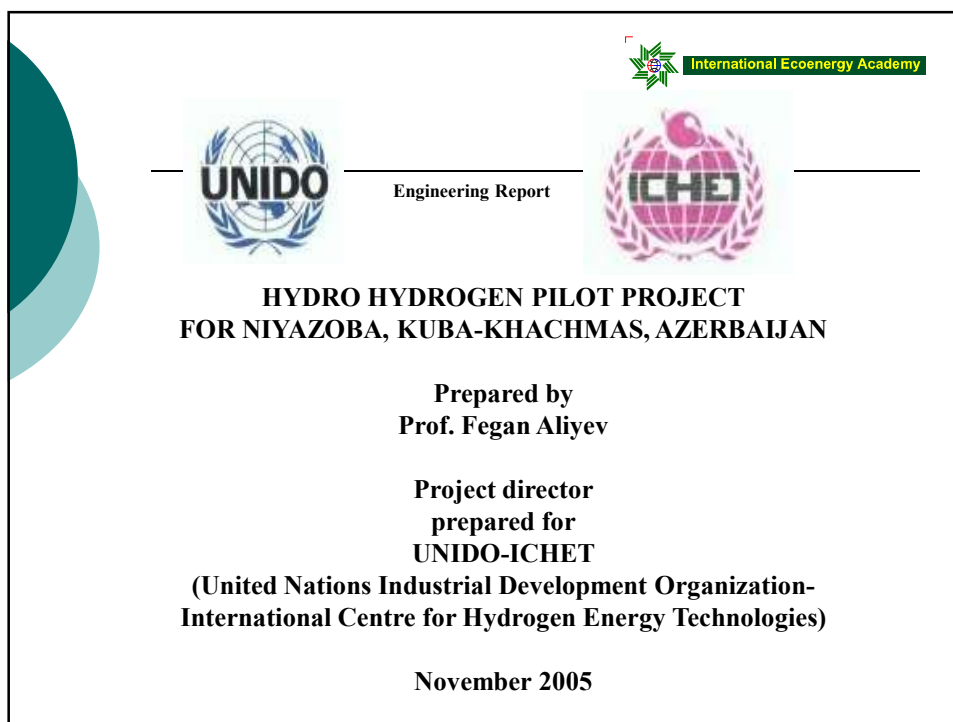


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Hydro-Hydrogen Pilot Project

The project will be implemented in three stages:

- Construction of two hydropower stations in Niyazoba village in the Kuba-Khachmas region, Azerbaijan Republic to produce electricity;
- Using an excess of energy (500 kWt) generated by hydropower for the production of hydrogen through electrolysis of water;
- Storage and distribution of hydrogen (and oxygen) produced at Niyazoba plant.





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The main advantages derivable from the project:

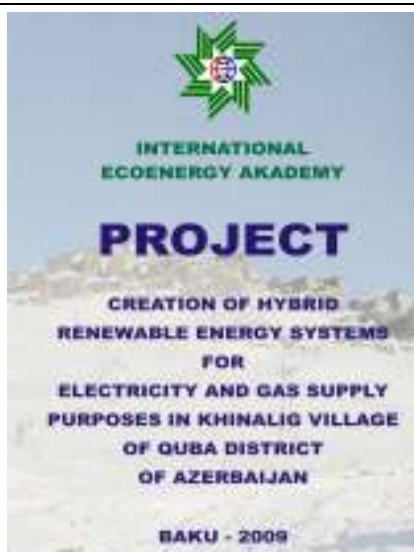
The combustion of H_2 used as fuel will contribute to reducing the amount of GHG, mainly CO_2

- The hydrogen produced in Niyazoba may be used for many commercial purposes including: commercial fixation of nitrogen from the air to produce ammonia for fertilizer; methanol production, hydrodealkylation, hydrocracking, hydrodesulphurization, metallic ore reduction and superconductivity study, etc.
- It will provide large employment opportunities in rural Azerbaijan
- Hydro-electric plants do not emit any of the standard atmospheric pollutants such as carbon dioxide produced by fossil fuel power plants.



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Project: Hybrid alternative energy plant for mountainous Khinalig village





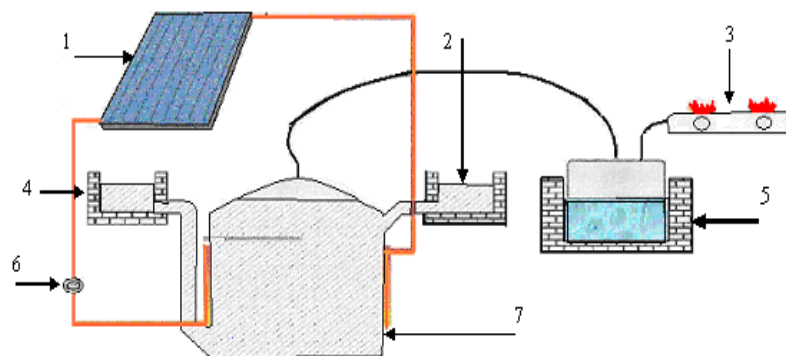


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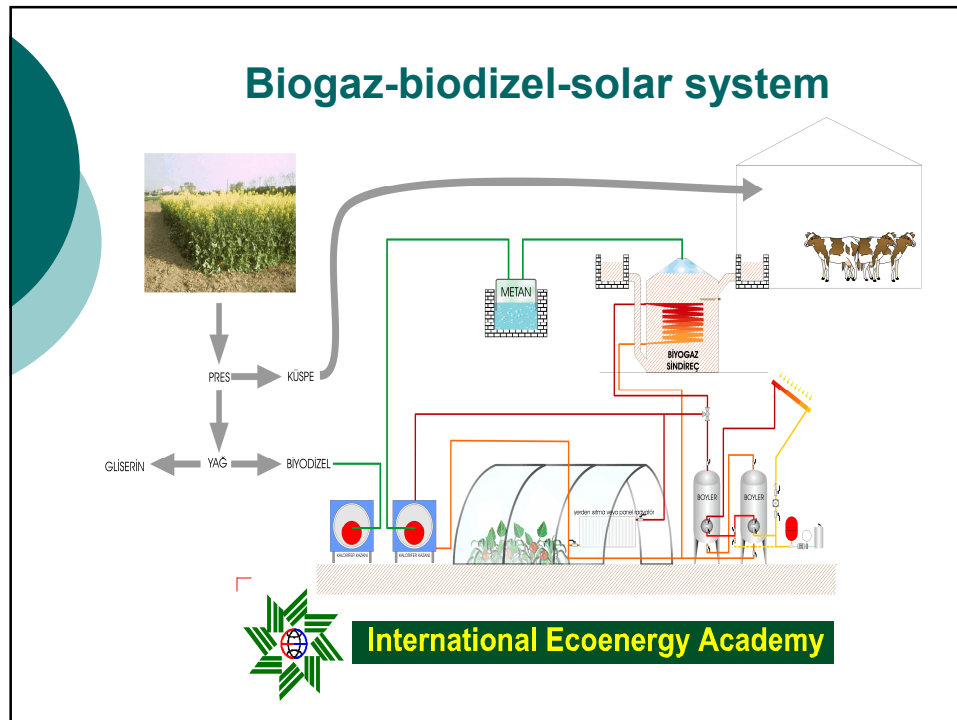


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Hybrid solar-biomass system



Block –scheme of working model of biogas production system (1 – solar collector , 2 - 4 - biomass reservoir, 3 – gas appliance, 5 – gas storage container , 6 – liquid pump, 7 – biogaz production tank)



**THANKS A LOT
FOR YOUR ATTENTION**