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Fawzi Banat

Editor PPT

Biography

Dr. Banat is a Professor & Cahir of Chemical Engineering at the Petroleum Institute. After obtaining his chemical engineering doctorate at McGill University, Canada, in 1995, he taught at Jordan University of Science and Technology (JUST), University of Bahrain and the German-Jordanian University (GJU) before joining the PI in 2011. His research focuses on membrane desalination, water and gas treatment. He has co-authored 115 papers and supervised more than 25 graduate students and post-docs. Among his 10 major awards are Khalifa and Shoman awards. He has successfully completed his administrative responsibilities as Dean of Graduate Studies, Dean of Engineering, Dean of Research, and Chair of Chemical Engineering Department in GJU and JUST universities in Jordan.

Research Interests

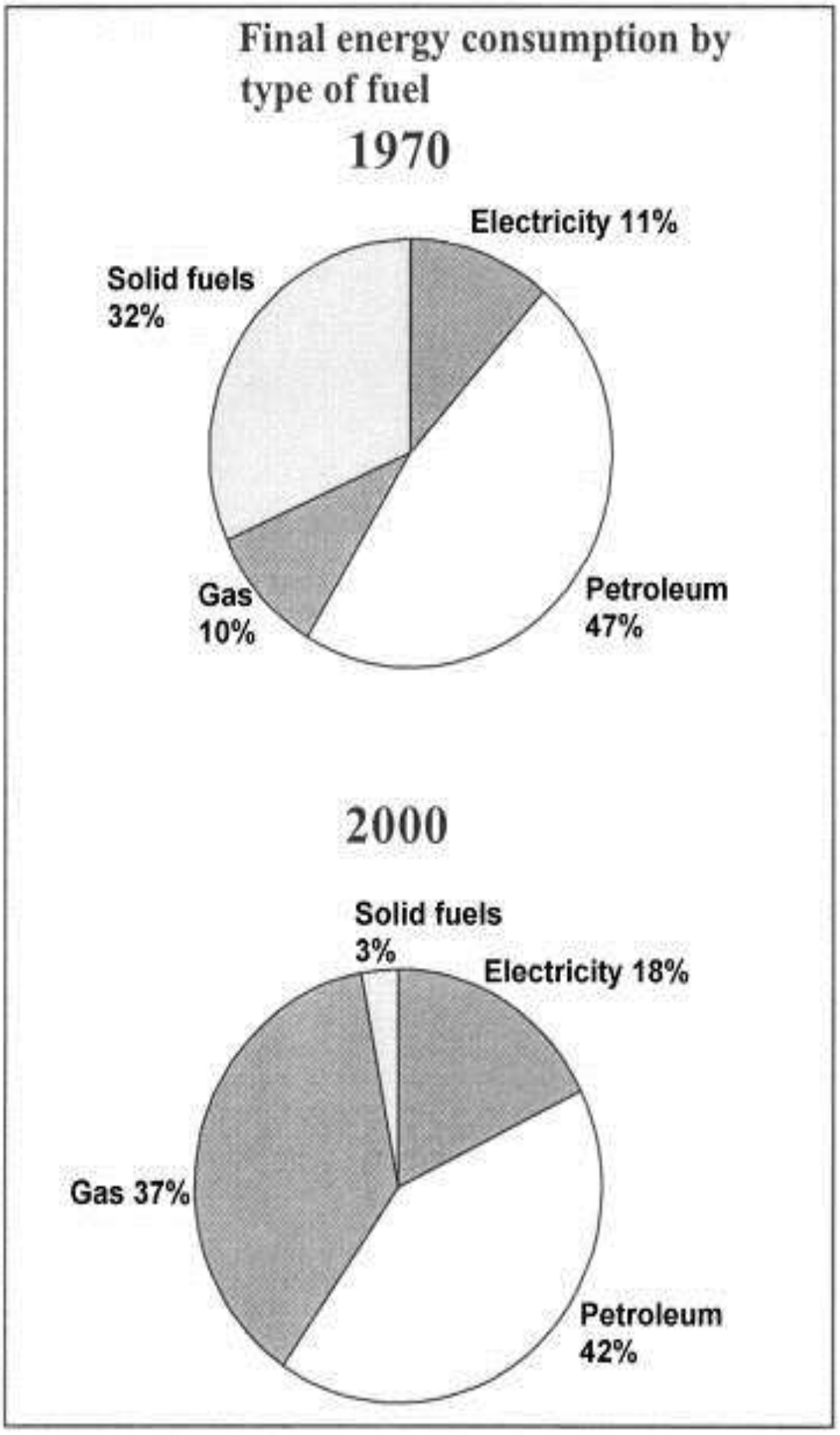
- Prof. Banat's research interests focus on fundamentals of multicomponent mass transfer, membrane separations applied to desalination and wastewater treatment, renewable energy and gas treatment

Renewable Energy

Renewable Energy Sources

- Radiant solar energy
  - Solar heating (passive and active), solar power plants, photovoltaic cells
- Biomass energy
  - Direct: combustion of biomass
  - Indirect: chemical conversion to biofuel
- Wind energy
- Hydro energy
- Geothermal energy
  - Power plants, direct use, heat pumps
- Ocean energy
  - Tidal; salinity-driven

Energy needs supplied



Present Energy Resources

- Fossil fuels - coal, oil, gas are all of limited amounts. Cant be replaced.

- Nuclear fuels -limited amounts of uranium for nuclear fission reactors but reprocessing of fuel possible.

All sources of energy ultimately come from the sun.

Wind, Wave and Hydro Power

Photovoltaics Active Solar Heating

Municipal and General Wastes

Landfill Gas Geothermal

Agricultural and Forestry Wastes

Energy Crops Fuel Cells

Hydro Energy

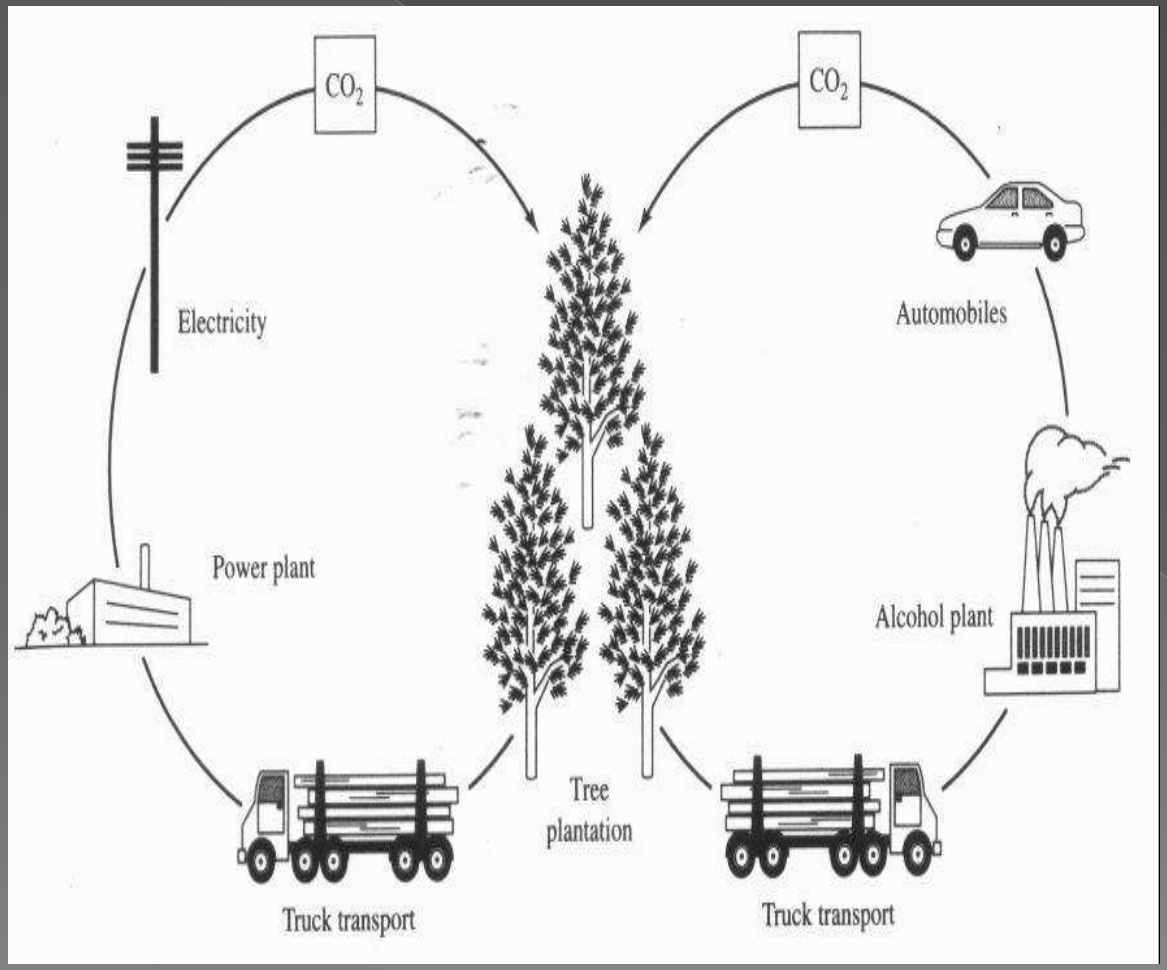
Currently largest source of electricity from renewables

Needs guaranteed supply of water.

Wind Energy

Very clean source of energy

Biomass Energy



- Biomass energy is the use of living and *recently* dead biological material as an energy source
- Ultimately dependent on the capture of solar energy and conversion to a chemical

Geothermal Energy

- Geothermal power plants
  - Use earth's heat to power steam turbines
- Geothermal direct use
  - Use hot springs (etc) as heat source
- Geothermal heat pumps

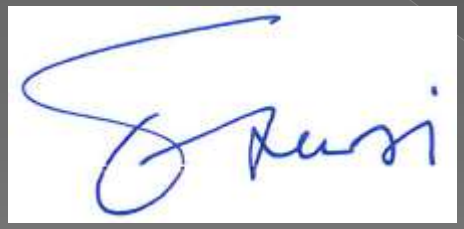
- Advantages
  - Renewable
  - Easy to exploit in some cases
  - CO_2 production less than with fossil fuels
  - High net energy yield
- Disadvantages
  - Not available everywhere
  - H_2S pollution
  - Produces some water pollution (somewhat similar to mining)

Related Journals

Chemical Sciences Journal

Chemical Engineering & Process Technology

Signature



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