Nuclear Energy in the 21st Century: A Global Perspective

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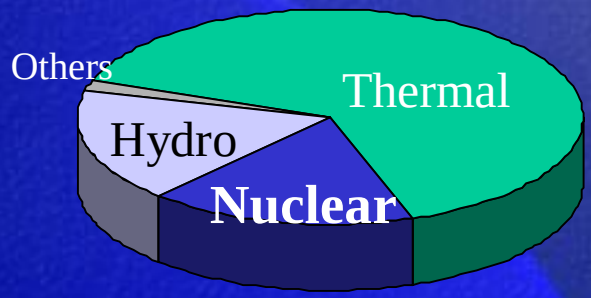
Today's nuclear:

some 440 reactors
1/6 of world's electricity



Future use of nuclear

Electricity

Hydrogen

Desalination

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Dimensions of the Global Environmental Crisis

Environmentalists' warnings:

- Unprecedented explosion in human numbers.
- Half in dire conditions.
- Within 25 years – half of the people could be without access to potable water

- Rising global demand for energy with continued use of fossil fuels – environmental challenge to face.

- **Global warming is already around us:**
  - hottest years have been recorded
  - thread of flooding – sea levels can rise as much as 20 feet

- melting of icebergs and icecaps – disruption of the Atlantic Gulf Stream

Urgent Necessity of a Decisive Strategic Response

- In 50 years world's population grows from 6 to 9 billion
- In 50 years energy consumption will double, or even triple

- Today's global CO_2 emissions – 25 billion tonnes a year
- To stabilise greenhouse gases 50% cut required by 2050
- Industrialised countries must take a lead

Crucial Contribution of Nuclear Energy

- **Nuclear – quintessential technology for sustainable development:**
  - Fuel – available for many centuries
  - Superior safety record
  - Virtually no pollution
  - reserves fossil resources
  - Costs are competitive and declining
  - Waste can be safely managed

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Hydrogen: distributing the clean-energy benefits of nuclear

- **Hydrogen, rapidly developing technology, offers**
  - storage of electricity,
  - clean transportation,
  - domestic and industrial use,
  - large-scale desalination
- **Hydrogen must be produced cleanly.**
- By producing hydrogen, nuclear power can contribute to the entire spectrum of energy use

Expanding Nuclear Future

- 31 nations have nuclear power
- Some nations, representing ½billion people, incl. Indonesia & Vietnam, are planning new nuclear build for the first time
- US plans 50% growth of its nuclear fleet over next 20 years
- Japan, Korea and Russia are committed to further nuclear power development
- China and India – significant nuclear construction over the coming years
- Western Europe – environmental concerns and issues of security of supply started changing minds in favour of nuclear
- Bulgaria, Czech Republic, Romania, Slovakia and Ukraine – expanding commitment to nuclear

Transnational Support for Global Nuclear Industry

- **World Nuclear Association** (WNA) – international trade association for fuel cycle companies and nuclear power generation
- WNA founded in 2001 on 25 year legacy of Uranium Institute.
- Our members in 35 countries – 90% of world fuel cycle production, $^{2}/_{3}$ of world nuclear generation.

World Nuclear University

- Joint project of WNA, IAEA, WANO and OECD/NEA
- **World Nuclear University –** strengthening educational base for the expanding role of nuclear.
  - Mission:
    - Improve the quality of nuclear education worldwide
    - Build student interest and enrolment
    - Globalisation of standards and credentials

  WNU - network of leading educational institutions, coordinated by a secretariat co-located with WNA and WANO in London

Conclusions

Energy future of Slovakia

- **Strategic decision taken now must consider long-term environmental issues and security of supply**
- **Building on what already exists:**
  - Industrial and regulatory infrastructure for nuclear industry
  - Improvements in operation and maintenance to international standards through professionalism, dedication, technical and engineering expertise
  - Nuclear – powerful source of energy, over half of country's electricity
  - Openness to international inspection and verification as strength of the industry's achievements
  - Mochovce 1 and 2 – stringent and up-to-date safety standards