

Vision for Nuclear Energy in the 21st Century Prepared by

Ministry of Natural Resources Canada

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Presentation Outline

- Current Situation
- Opportunities
- Essential elements for "Rennaissance"
- Challenges
- Summary







Source: EIA





Canadian Energy Context

 Canadian Kyoto commitments putting increased attention on GHG emissions



Nuclear in the Canadian Energy Context

- Capacity factors of Canadian CANDU reactors improving
- CANDU plants returning to operation now 18/22 operating
 - Pickering Unit 1 returned to service 2005 Oct.
 - Expect decision on refurbishment of Bruce 1,2,
 - Decision made to refurbish Pt. Lepreau in 2008





Ontario Electricity Supply Scenario



Note: All Coal out by 2007 - 2009; all nucl**ear** units refurbished; 50% nuclear share maintained





Elements for Successful Renaissance

- Support/renew nuclear R&D Infrastructure
 - Energy, materials
 - Other applications science, medicine
- Invest in Next Generation Technology
 - Generation III+ (e.g. ACR 1000)
 - Generation IV (SCWR)
- Secure Fuel Supply
- Develop/maintain industrial capacity
- Develop/maintain International Partnerships





Canadian Technology Vision







Partnerships Help Assure Project Delivery

In-Service Date	Plant	Status
1996	Cernavoda Unit 1, Romania	On budget, on schedule
1997	Wolsong Unit 2, S. Korea	On budget, on schedule
1998	Wolsong Unit 3, S. Korea	On budget, on schedule
1999	Wolsong Unit 4, S. Korea	On budget, on schedule
2002	Qinshan Phase III, Unit 1, China	On budget, 6 weeks ahead of schedule
2003	Qinshan Phase III, Unit 2, China	On budget, 4 months ahead of schedule





Challenges

- Grow public support
- Ensure safety & security
- Economics and Financing
- Waste management
- Non-proliferation and safeguards





Grow Public Support

- Public opinion is shifting toward nuclear power
 - 70% support refurbishment of existing plants regional variation
 - More than 60% of Canadians support construction of new reactors
 - All numbers increase when linked to clean air
- Senior environmentalists recommending reconsideration of nuclear power
 - James Lovelock, Patrick Moore
- Continued communication of the benefits is required







Grow Public Support

- Safety & Security
 - Effective regulatory regime
 - International regulatory collaboration, CNS
 - Continued safe operation
- Waste Management
 - Decommissioning & waste management of obsolete facilities
 - Long term management of spent fuel





Spent Fuel Management

- Nuclear Waste Management Organization created to engage public in assessing and recommending options for long term management of spent fuel
- NWMO completed public consultation & assessment phase
- Draft report recommends "Phased Adaptive Approach" – Final report due 2005 November
- Major newspaper editorial positive
 - "the waste problem is eminently solvable"





Non-Proliferation & Safeguards

- International treaties NPT
- Adopt IAEA safeguards & additional protocols
- Respect nuclear export controls
- Develop proliferation resistant reactor designs
- Develop/use proliferation resistant fuel cycles
 - Once through fuel cycles, or
 - Recycle without separation





Summary

- The benefits of nuclear power are being more widely recognized
- Conditions are in place for a "nuclear rennaissance"
- Nuclear will be an essential element of a clean energy future for Canada in the 21st century
- Canada is investing in R&D infrastructure, in advanced CANDU designs, and in Generation IV







Merci... Mina-san, domo arigato gozaimashita





