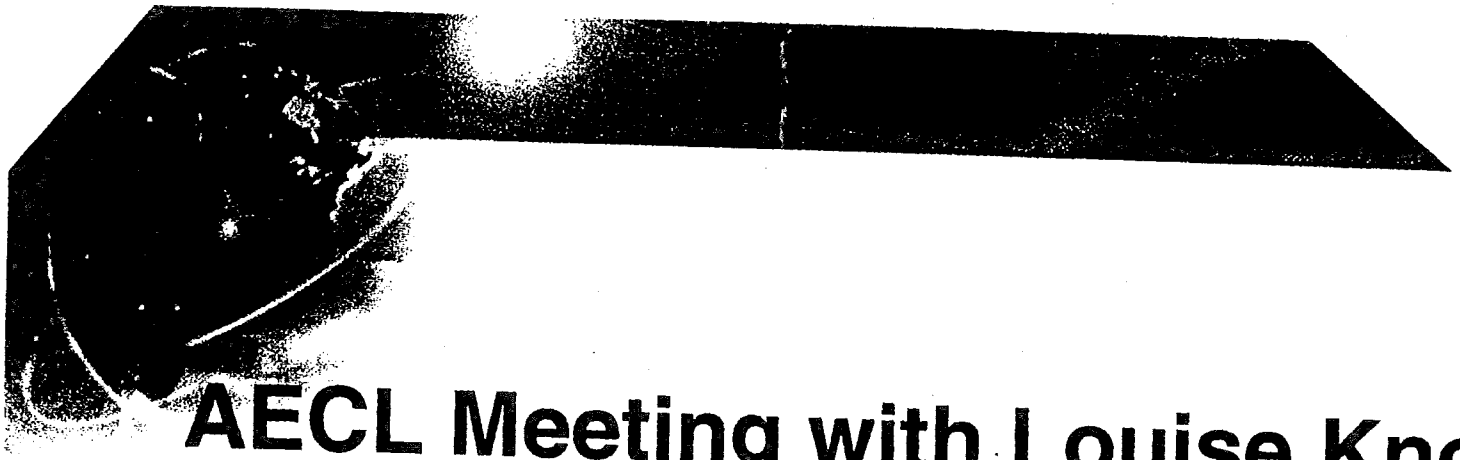


AECL Meeting with Louise Knox, Ontario Regional Director, CEAA

November 8, 2005

AECL

Purpose of Meeting

- To brief CEAA on status of Ontario's electricity supply and potential role for new CANDU reactors
- To share AECL's views of issues related to deploying new CANDU reactors
- To seek your views on EA process for new CANDU builds

Review of Recent Energy History in Ontario

- August 2003:
  - Blackout
- OPG Review Committee
  - Confirmed that the management of Pickering led to problems
  - CANDU technology and design were exonerated
- Ontario Premier announces closing of coal plants in Ontario by 2007 (now revised to 2009)
- AECL analysis shows Ontario stakeholders that a base load gap opens in 2013.
  - New nuclear build: construction = 5 years, nominally 3 years for EA. Analysis shows that time is of the essence

Review of Recent Energy History in Ontario (cont'd)

- **Ontario Power Authority**
  - Minister of Energy specifically asked OPA to look into new nuclear builds
- **Summer 2005:**
  - Voltage reductions
  - Requests to reduce consumption
  - Some large voluntary electricity reduction from industry
  - Warnings of rolling potential blackouts
- **Premier's speech at OEA, Sept. 14, 2005**
  - "We are prepared to go ahead with economical, safe, new nuclear if that is recommended by the OPA."

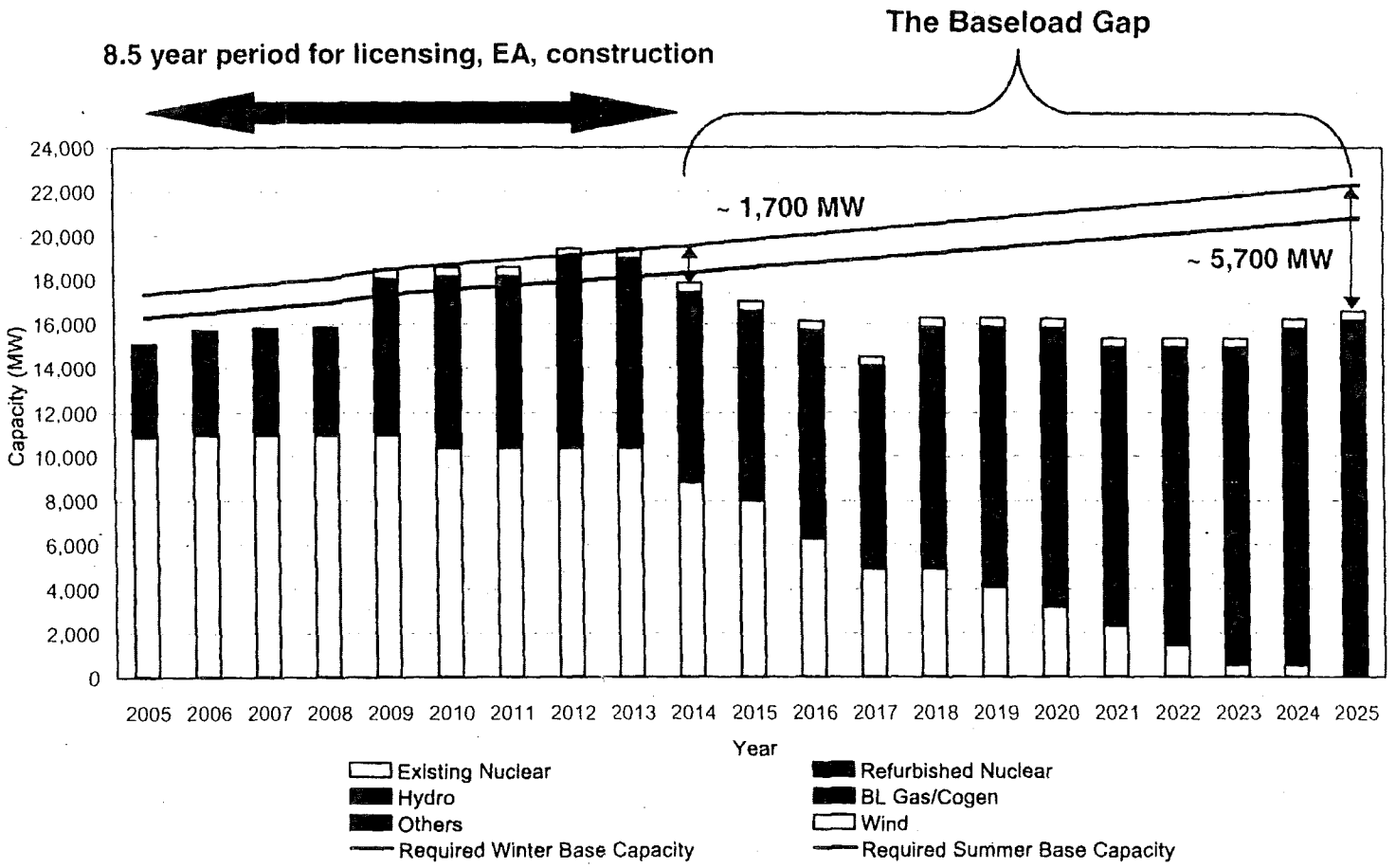
Near-Term Future of Energy in Ontario

- **Existing supply sources will decrease**
  - Coal being phased out (Clean coal expensive, CO2 still issue)
  - Aging generators (fossil and nuclear)
  - Potential for hydro imports, but questions regarding ability to get much power from existing transmission lines
- **Energy demand in Ontario will increase**
  - Conservatively projected at ~1% annually
- **Challenges in achieving generation**
  - RFPs for renewables and gas plants are not delivering level of power originally expected
    - Commercial, transmission & community-support issues

The Supply Equation

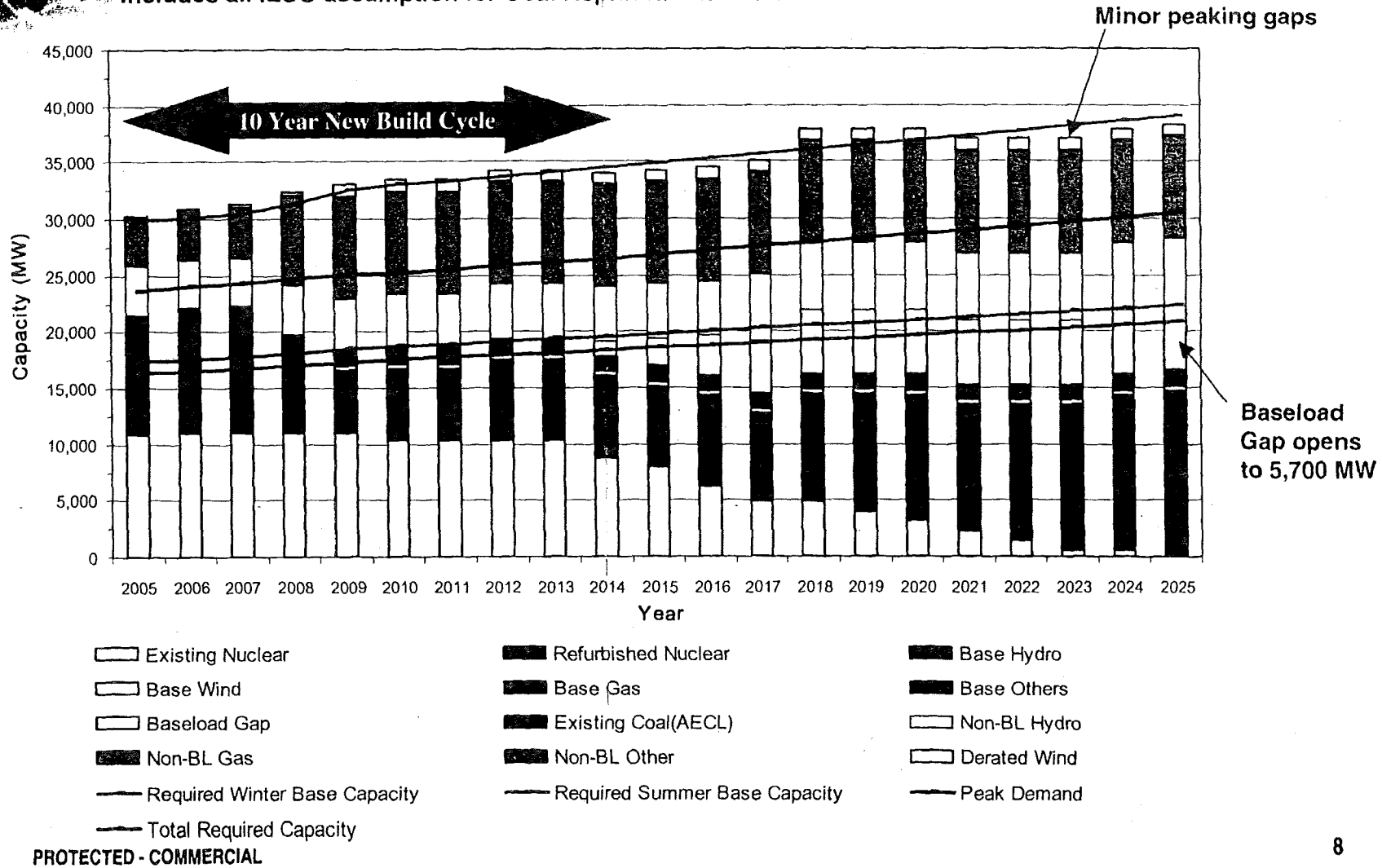
- **There are three kinds of electricity generation sources:**
  - *Baseload plants* supply continuous electricity
    - Respond to weekly/monthly variations in demand
    - Ontario: Nuclear, some hydro, CCGT, biomass
      - Solar & wind are special cases, but sometimes grouped as base
  - *Peak plants* top off supply when demand is very high
    - Respond to momentary/hourly variations in demand
    - Ontario: Coal, some hydro, some gas
  - *Intermediate plants* add supply to fill gap between base & peak
    - Respond to daily/weekly variations in demand
    - Ontario: Hydro dams, gas turbines
- **A balanced system requires adequate sources of all three types**
  - **Baseload is a major factor in the supply issue**

Ontario Baseload Gap Analysis



eneration Gap: Ontario needs decisive action

Includes all IESO assumption for Coal Replacement + more



Options for Filling Baseload Gap

- **Each electricity source has its own merits**
  - **Hydro**
    - **Feasible sites fully exploited**
      - **Analysis includes 1,400MW run-of-river in Ontario, plus contribution to base from Conawapa, plus Niagara Tunnel**
  - **Combined Cycle Gas Turbine**
    - **CCGT economics highly dependent on natural gas prices**
      - **natural gas supply not clear & competes with peaking options**
  - **Clean Coal**
    - **Commercially / politically available?**
    - **Options still emit CO_2 and produce toxic waste**
  - **Biomass**
    - **Fuel availability and transportation?**
      - **The gap size is massive**
  - ➢ **Nuclear**

Addressing the Energy Crisis Now

- **Must choose a base load solution to minimize the cost and have low environmentally impacts**
  - **To reduce cost, can leverage existing transmission capabilities and existing infrastructure (e.g. sites, grid, large generation centers)**
  - **Minimize process delays**
  - **Most base load options require significant lead times (e.g. hydro, nuclear)**

- **Ontario must therefore begin an Environmental Assessment now to keep nuclear option open**

The CANDU Option

- Designed for base load with intermediate potential
  - Intermediate potential largely unexploited in Ontario
- Consistent with existing infrastructure
  - Maximizes use of existing sites and grid nodes
- Supplies stability to accommodate delays in peaking and source-driven supplies
  - Not competing with gas or renewables – all have their place
- Cost effective
  - CERI study shows nuclear is a lower-cost option than CCGT based on projected gas prices

Managing Risk

- **AECL's analysis shows that an EA for new nuclear builds can conclude in 3 years, and have a 5 year construction period**
  - **Mitigating factors:**
    - **G2, Lepreau experience**
    - **Supportive communities around nuclear plants**
    - **CANDU 6 technology is well known**
    - **Environmental site information is well known (e.g. Darlington site has ITER info)**
    - **Waste issues are being handled by NWMO and Federal Government**
    - **Energy crisis may speed political will to streamline processes**
  - **Challenges:**
    - **Federal / provincial coordination**

Managing Risk (cont'd)

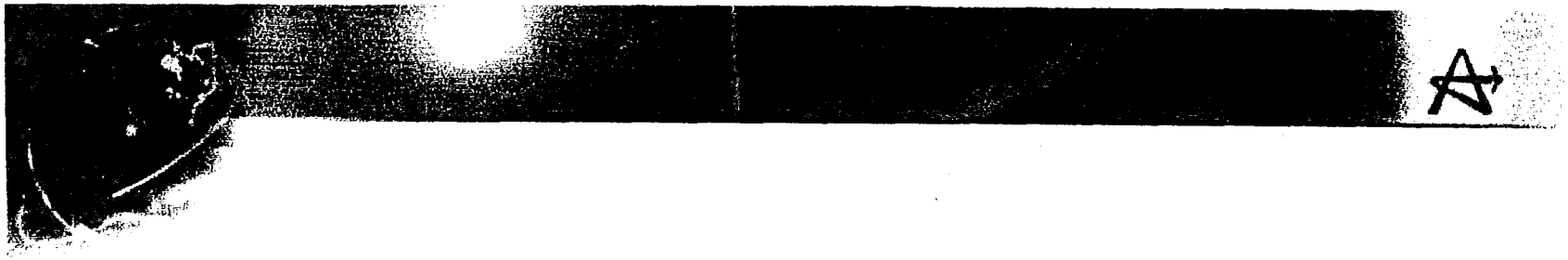
- AECL understands commercial risk
- Recent track record demonstrates AECL's ability to manage commercial and project risks in delivering reactors
- Need to better understand procedural and approvals risks for conducting an Environmental Assessment for nuclear in Ontario

Challenges in EA Process

- Practitioners in the field tell AECL that EA can take 2 to 5 years or more for nuclear
  - We believe 3 years is reasonable
- There are a variety of perspectives in approaching an EA for a new nuclear build
  - AECL recognizes that nuclear power carries obligations for transparency that may exceed those of other technologies
- We recognize there may be procedural features that add time for a CNSC EA
  - CNSC / CEAA interaction
- AECL is seeking your advice on this to keep the nuclear option open
  - E.g. What are the key choices we can make to have an effective and open evaluation?

Questions

- Did you participate in the Bruce Power units 1 and 2 refurbishment EA?
- What is your experience with fed/prov coordination?
- Does it matter if the project is on a site like Darlington, where transmission lines are there, or if it is on a site like Bruce where transmission lines are likely required?
- Can we get your advice on how to achieve a 3 year EA?



Background Information

Nuclear is Back on Ontario's Agenda

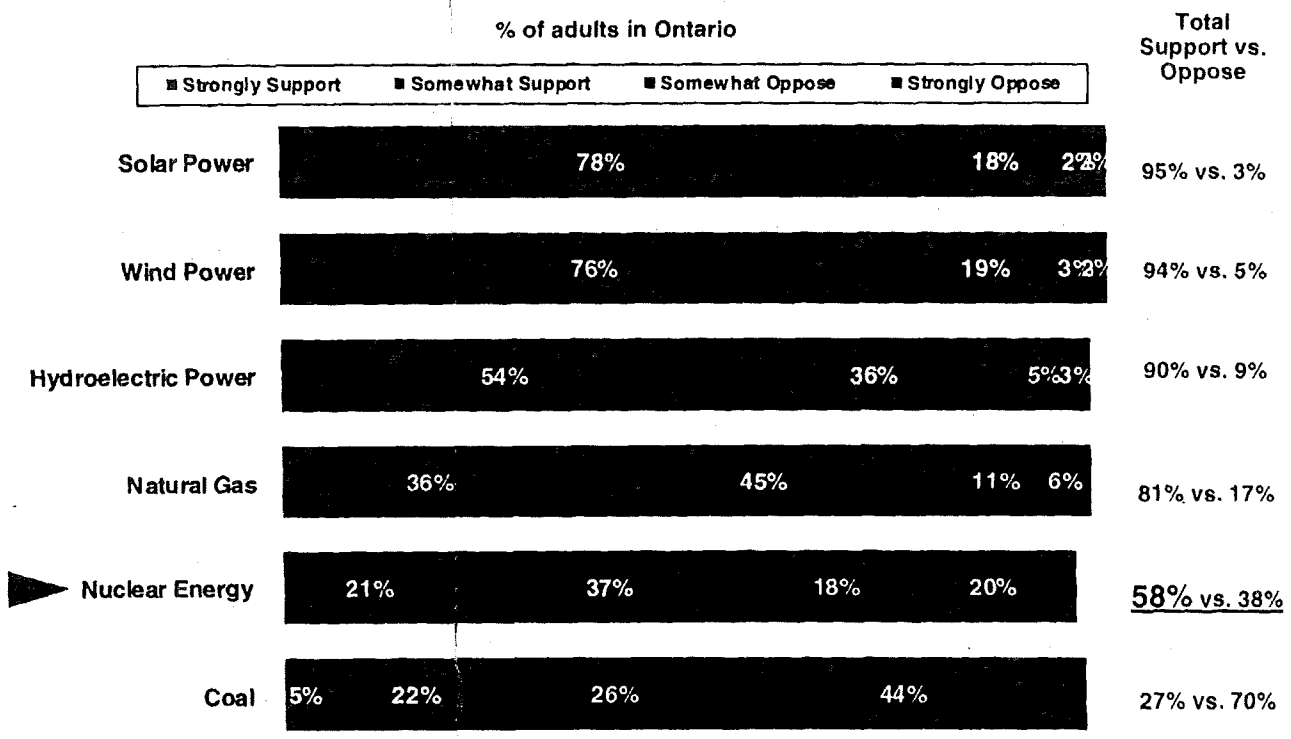
Toronto – August 2003

"We are prepared to go ahead with economical, safe, new nuclear if that is recommended by the Ontario Power Authority." Premier Dalton McGuinty, Sept 2005

"Ontario needs more nuclear power plants and will soon have to decide how many and where new reactors should be built - - that decision is coming quickly"

Minister of Energy Dwight Duncan, Aug. 20, 2005

Six In Ten (58%) Residents Of Ontario Currently Support Nuclear Energy...



Q. I am going to read you a list of several ways to produce electricity. Please tell me whether you strongly support, somewhat support, somewhat oppose, or strongly oppose each way of producing electricity.

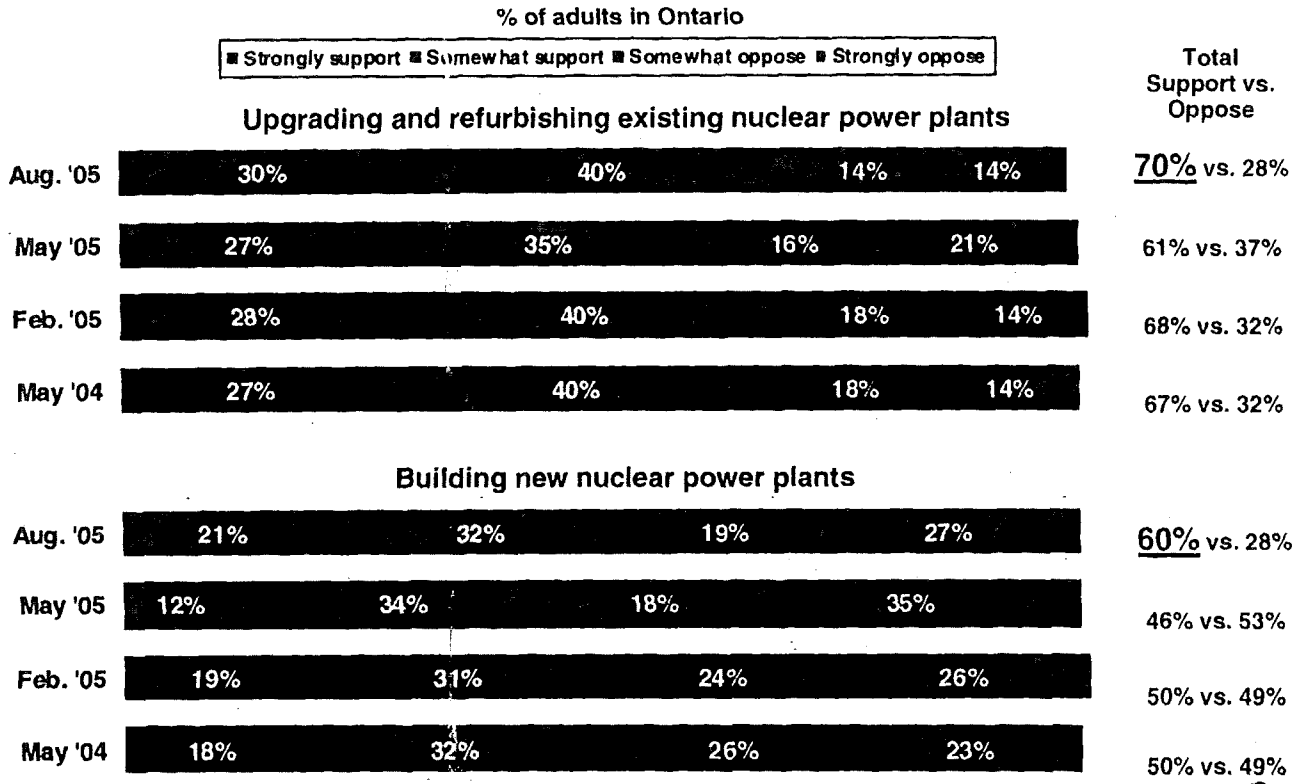
Weighted Base: n=801

41

Canadian Nuclear Association
Association nucléaire canadienne

Ipsos

Ontarians Supporting Refurbished Nuclear Plants (70%) And Building New Ones (60%) Are At Their Highest Levels Since May 04...



...plants in Canada with various fuel sources will have to be replaced over the ... In Ontario 80% of the plants will have to be replaced. In order to help meet ... would you strongly support, somewhat support, somewhat oppose or strongly oppose (NOTATE OF DON'T) And how about...Base: N=800

Canadian Nuclear Association
Association nucléaire canadienne

Support from Environmentalists

" Nuclear energy is the only non-greenhouse-gas-emitting power source that can effectively replace fossil fuels and satisfy global demand.

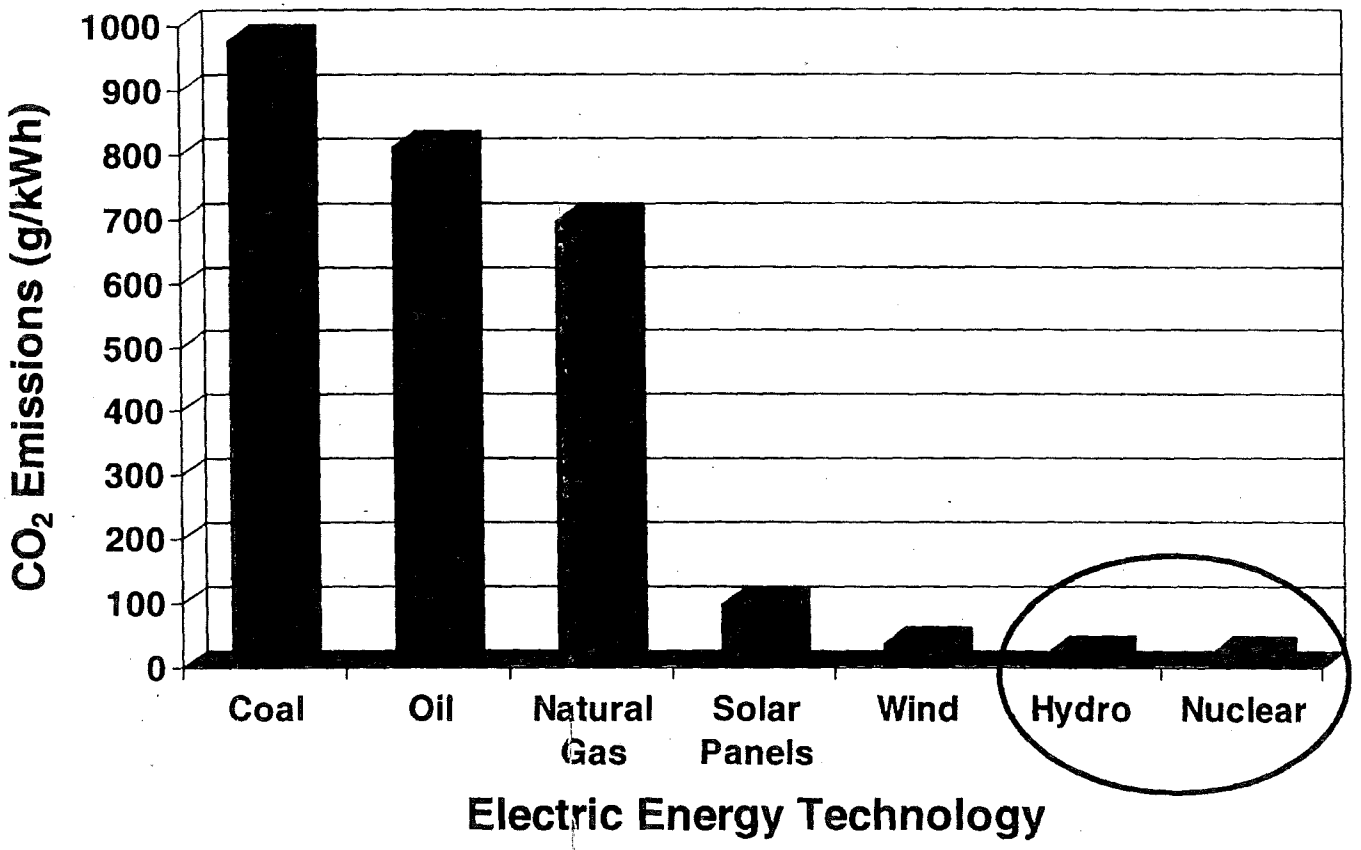
There is now a great deal of scientific evidence showing nuclear power to be an environmentally sound and safe choice"

Dr. Patrick Moore: Chairman and Chief Scientist of Greenspirit Strategies Ltd. and Co-Founder of Greenpeace

" I hope that it is not too late for the world to emulate France and make nuclear power our principal source of energy. There is at present no other safe, practical and economic substitute for the dangerous practice of burning carbon fuels."

Dr. James Lovelock: CBE, FRS

CANDU: Key to Kyoto



Source: IAEA Spadero et al. 2000

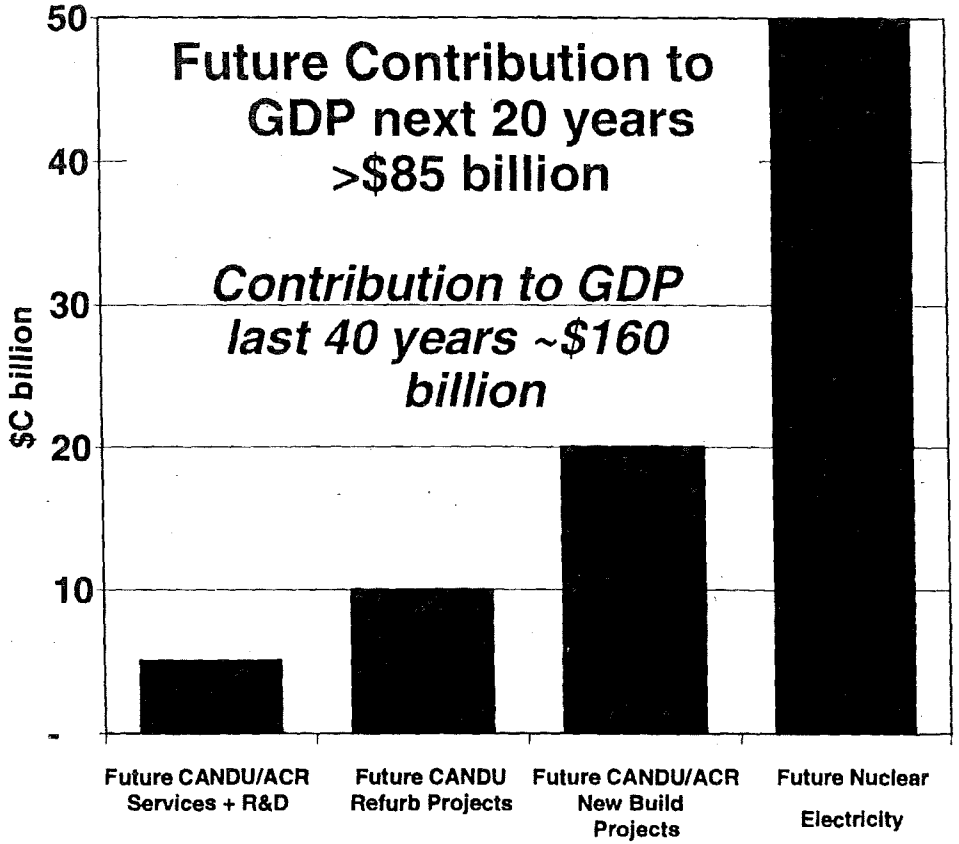
CANDU: Benefits to Canada

CANDU is Canadian:

- ✓ 30,000 jobs
- ✓ 150 companies
- ✓ $5 billion / yr. industry

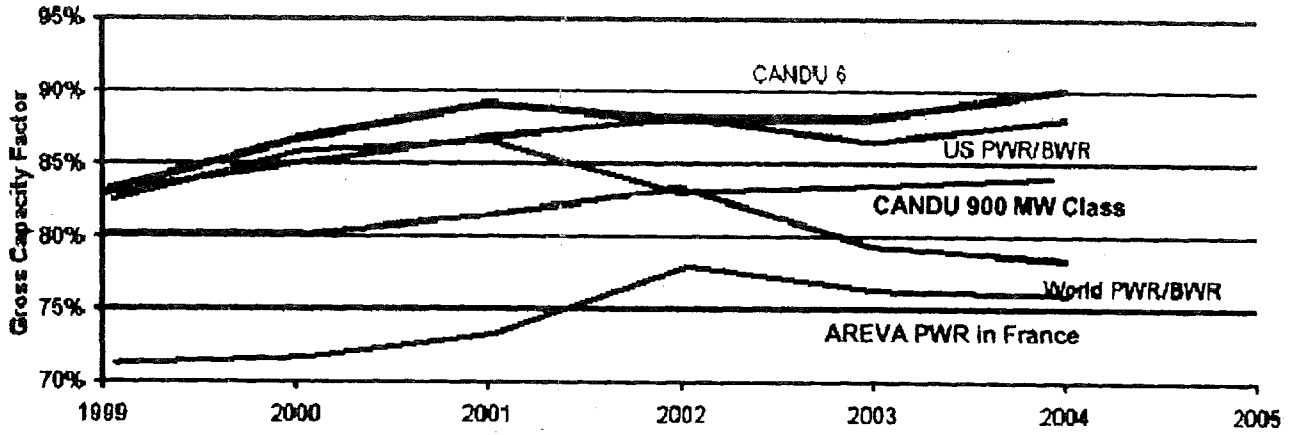
Essential to meeting Kyoto commitments:

- ✓ Clean air benefit up to 100 MT GHG/ yr.
- ✓ One ACR station will avoid 14 MT GHG/ yr.



CANDU 6 outperforms LWR

CANDU 6...4 continents - 5 countries - 6 utilities



CANDU Performance vs. U.S., French and World PWR/BWRs*

* COGnizant June 2005, French data from NEI end of year rolling 12 month data (June 2005)
The graph is for comparison of trends only

Excellent CANDU 6 Performance
(to end of Dec 2004)

- Operating experience of all CANDU 6 plants is world class
- CANDU 6 achieved average capacity factor of 90.2% in 2004
- Entire CANDU 6 fleet averaged 87.5% Lifetime CF—higher than the world BWR and PWR fleet
- Top 3 CANDU 6 units achieved 97% Capacity Factor for 2003

Pt. Lepreau, New Brunswick	1 February 1983	83%
Gentilly 2, Quebec	1 October 1983	79%
Wolsong 1, S. Korea	22 April 1983	86%
Embalse, Argentina	20 January 1984	85%
Cernavoda 1, Romania	2 December 1996	87%
Wolsong 2, S. Korea	1 July 1997	93%
Wolsong 3, S. Korea	1 July 1998	94%
Wolsong 4, S. Korea	1 October 1999	96%
Qinshan 1, China	31 December 2002	84%
Qinshan 2, China	20 July 2003	88%

Source: COG (Dec 2004)

Source: COG

Enhanced CANDU 6 Profile

- **CANDU 6: AECL's Workhorse Reactor**
  - Proven, excellent performance since 1983
  - Consistent in locations around the world
  - Up-to-date design
  - Has been continuously updated to meet evolving market and regulatory demands. Most recent project: Cernavoda 2; initiated 2002, in service 2007
- **Enhanced CANDU 6: Based on AECL's technology advancements ACR development and on feedback from projects and operations, a suite of valued-added enhancements is ready to incorporate in the next CANDU 6 project**
  - Advanced control software and hardware
  - Improved turbine cycle efficiency and power output
  - Hardened containment and safety systems
  - Material and system improvements for longer life and easier maintenance

Advanced CANDU Reactor (ACR-1000)
The next step in CANDU Evolution

- ✓Combines proven features from CANDU 6 design with technology innovation
- ✓Capital Cost reduction
- ✓ Optimization and waste reduction
- ✓ Superior economics = competitive with coal and gas (CERI studies)
- ✓ 42 month construction schedule; project-ready by 2010 for 2015 in-service
- ✓ First-Of-A-Kind risk minimal due to proven CANDU 6 platform as base
- ✓ Canada (CNSC) pre-licensing
- ✓ Need an efficient EA process in Canada to meet in-service targets for ACR
- ✓Low cost baseload options

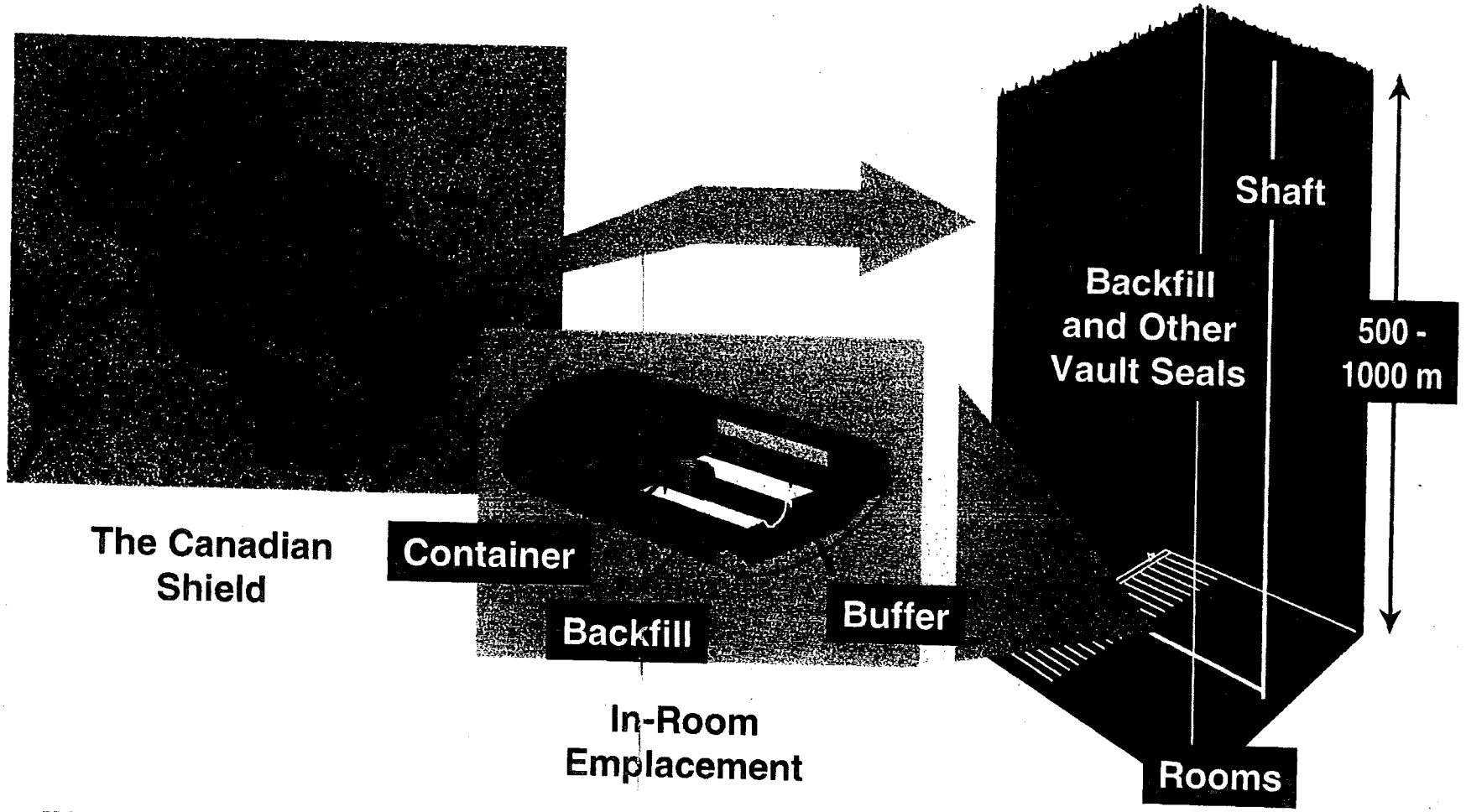
AECL Has Waste Solutions Now

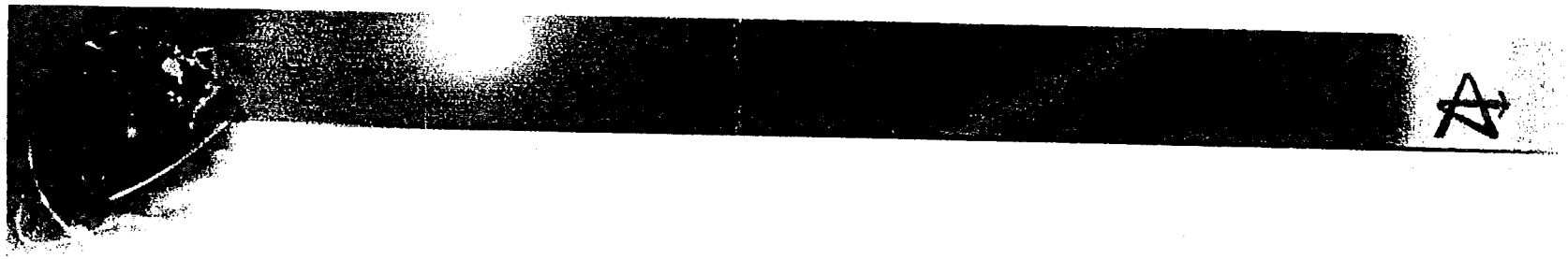
Waste Management Solutions Today

- **Dry fuel storage technology - MACSTOR®**
  - **In use in Canada, Korea, Romania**
  - **Good for 100 years before replacing**

- **Waste disposal concept developed**
  - **URL (Underground Research Laboratory) constructed in Canadian Shield**
  - **20-year, $900M study of deep disposal concept**
  - **Reviewed by a federal environmental review panel**
  - **NWMO in dialogue with Canadian public on options for waste management**

Permanent Disposal of Used Nuclear Fuel





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