SPENT FUEL IN CHILE

International Conference on Management of Spent Fuel from Nuclear Power Reactors

31 May - 4 June 2010, Vienna

F. López L., Chilean Nuclear Energy Commission, Santiago, Chile

SCOPE

- SPENT FUEL MANAGEMENT
- THE PLAN OF NUCLEAR POWER
- FUTURE OPTIONS FOR SF
- CONCLUSIONS

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SPENT FUEL MANAGEMENT

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Chilean Nuclear Energy Commission CCHEN

- Institutional Framework
- Nuclear Technological Framework

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Spent Fuel Management

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Institutional Framework:

- Ministry of Energy
- CCHEN is at present the Regulatory Body for nuclear applications and also operates nuclear facilities
- Comprehensive Waste and Safety laws

Spent Fuel Management

Nuclear Tech. Framework

- RECH-1, 5 MW at La Reina
- RECH-2, 10 MW at Lo Aguirre
- MTR fuel fabrication facility
- Uranium Conversion Facility

Spent Fuel Management

- Agreement with U.S. / DOE
- RERTR participation
- MTR fuel fabrication

Spent Fuel Management

- First Shipment August 1996, 28 FA's
- Second Shipment December 2000, 30 FA's
- Third Shipment March 2010, 69 FA's

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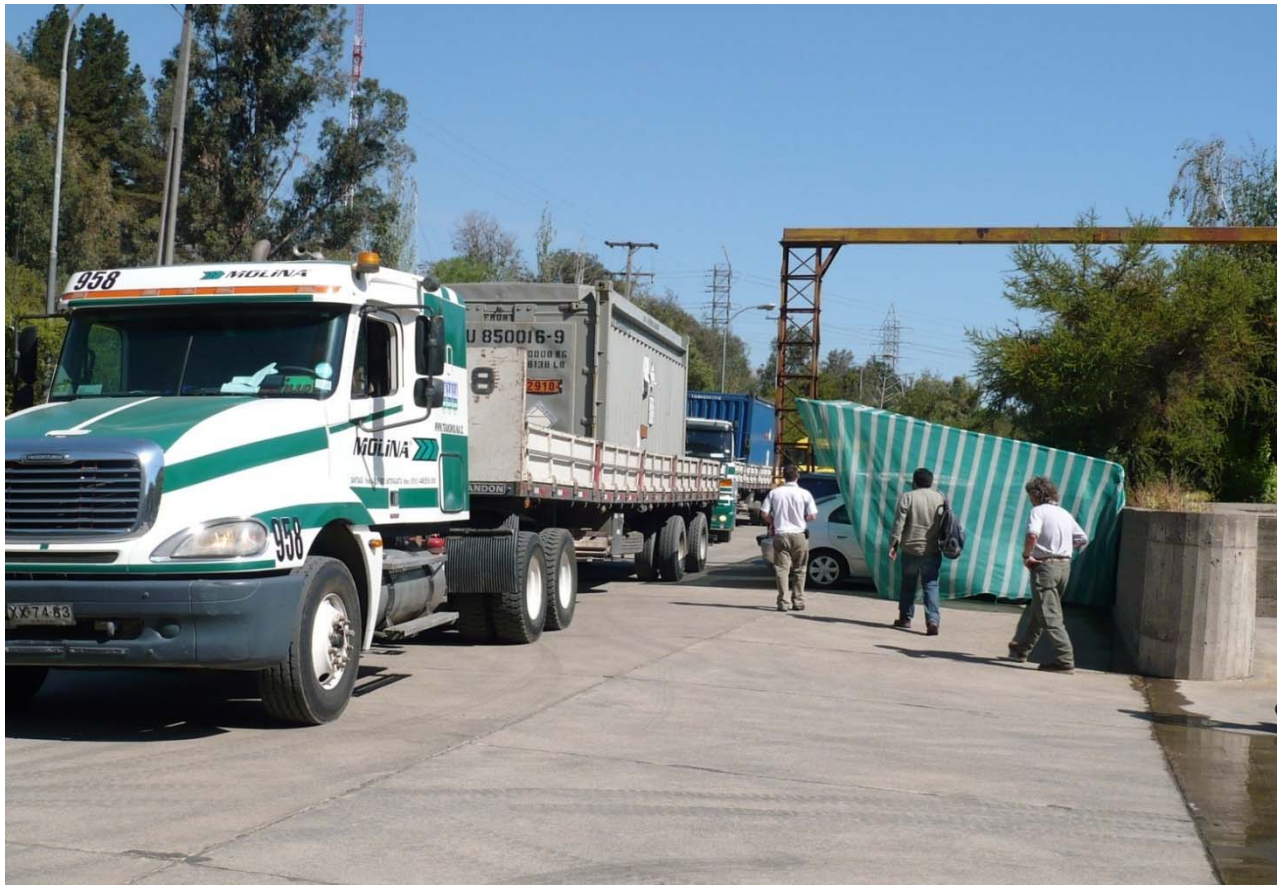

SF Shipment Operations

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NAC Cask used to transport SF

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Transfer Cask in RECH-1

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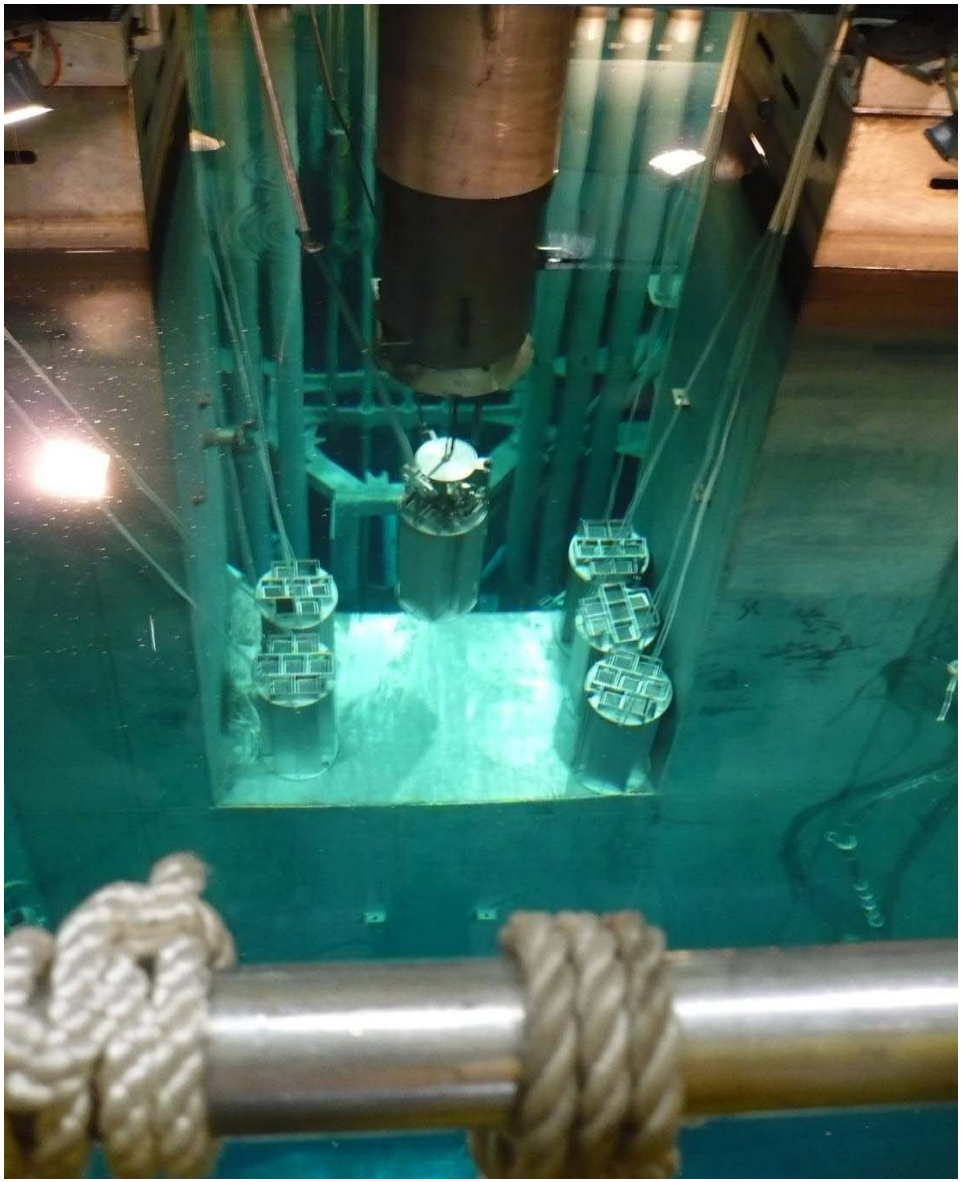

Spent Fuel in baskets

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Cask loading Operations

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ISO Container at Valparaiso Port

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ISO Container at the Port

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THE PLAN OF NUCLEAR POWER

- Energy shortages by 2024
- Is nuclear power an option?
  - How many NPP are needed?
  - How much Spent Fuel?

The Plan of Nuclear Power

Energy shortages by 2024:

Drought has caused unpredictable Hydro

Gas supplies from Argentine have stopped

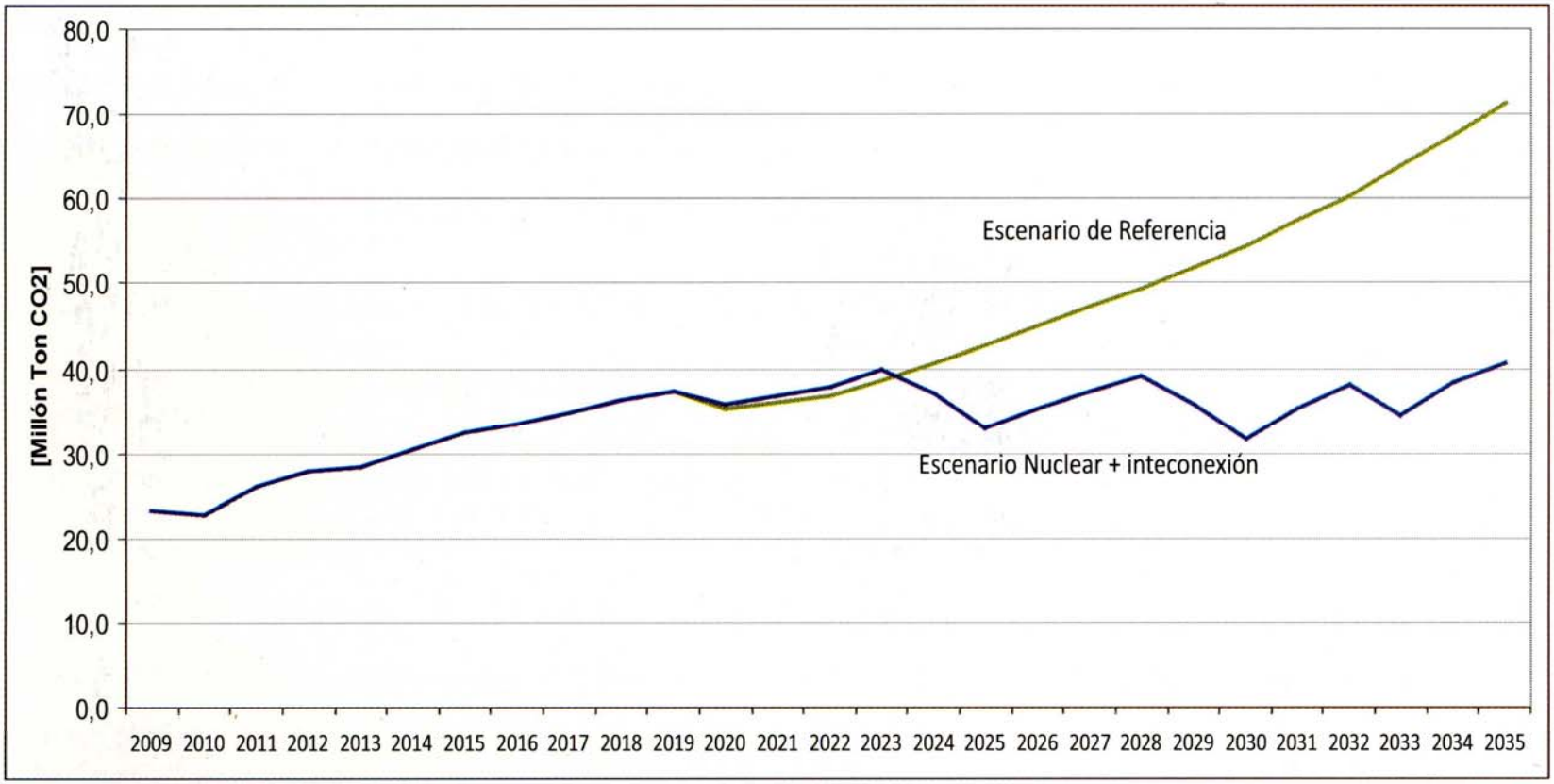
Fossil fuel & Oil prices are on the growth

The demand for electricity will be 27 GW

The Plan of Nuclear Power

Is Nuclear power an option?

- A first study, the Zanelli report
- Present challenge: closing the gaps
- Applying the IAEA 19 issues plan
- No decision of NNP at this point!



Fuente: Elaboración propia a partir de Informe Precio Nudo Octubre 2009 y proyecciones de modelo MESSAGE, considerando sólo la generación eléctrica y usando factores de emisión IPCC.

The emissions of CO2 without nuclear (Referencia) and with the use of NPP's in Chile (blue line)

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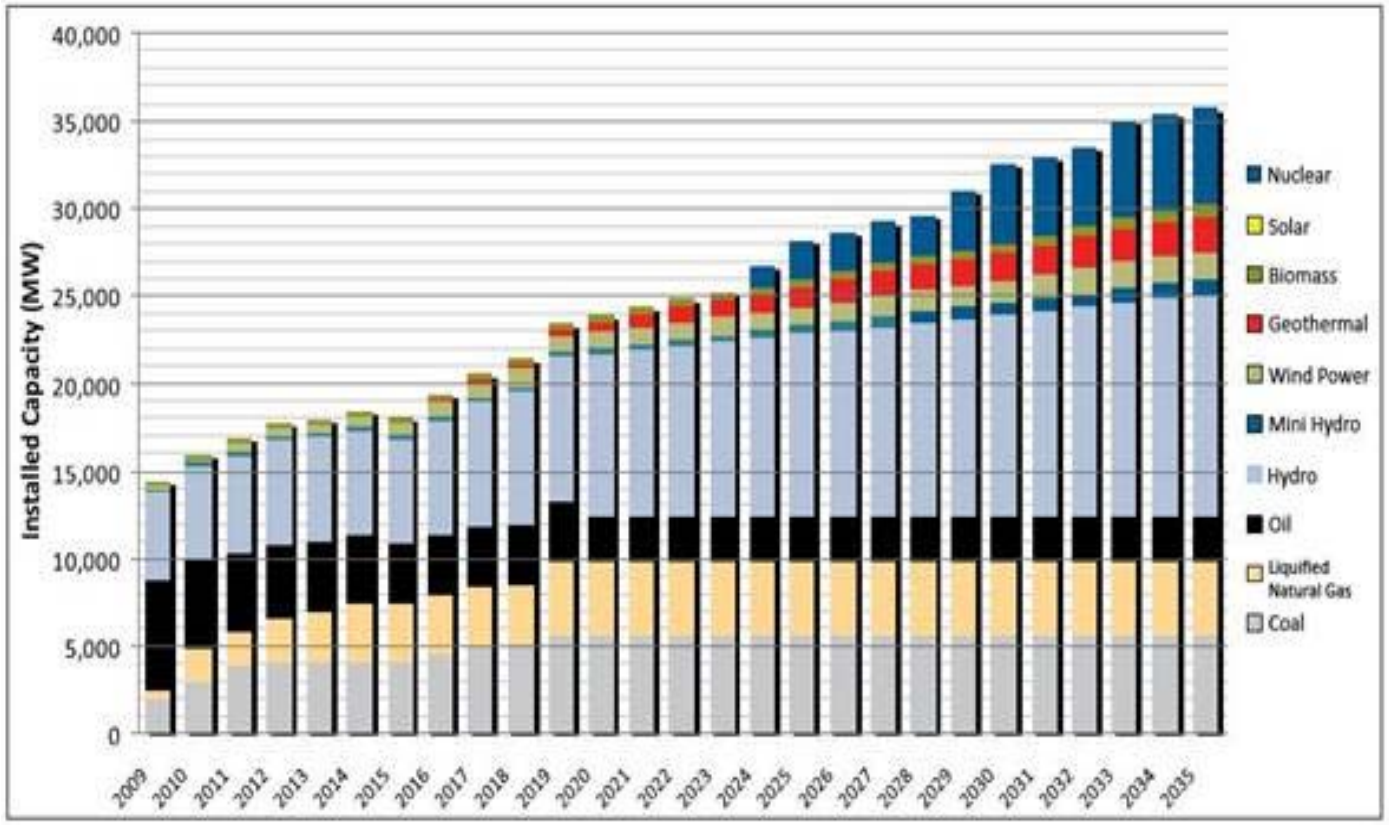

Source: Own development based on Node Price Report, October 2009 and MESSAGE model projections

Power generation by 2035 including the nuclear option
Total installed capacity estimated: 36000 MW

The Plan of Nuclear Power

How many NPP are needed?

- By 2024, one 1100 MW reactor will be needed
- Possibly up to five reactors 2035
- Possibly Generation III or III+
- Open Fuel Cycle for Chile

The Plan of Nuclear Power

How much Spent Fuel?

- Each recharge, about 25 T HM
- Each reactor could operate 60 years
- This scenario: about 7500 T HM by year 2102

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FUTURE OPTIONS FOR SF

- Management and Long term responsibilities
- Interim Storage at the Site

Future Options for SF

Management and Long term responsibilities

- New Regulatory body, independent from CCHEN
- Control of risks for health and safety, short & long term
- Responsibilities after reactor decommissioning
- Observe world technical advances in SF handling

Future Options for SF

Interim Storage at the Site

- At Reactor: SF ponds larger than average
  - Keep for 30-40 years for cool down
- Away from Reactor: dry storage
  - Keep for 40-50 years

This is a well known technology

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Future Options for SF

Final Disposal:

- Various studies, no final operational repository yet
- Open fuel cycle with reprocessing option open
- By year 2100 make a decision on final disposal
- Deep repository?

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CONCLUSIONS

- Strengthened safety and Institutional setup
- Keep SF long periods in Interim Storage
- Defer decision of final disposal waiting for the development of new techniques

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¡THANK YOU!

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