Comisión Nacional de Energía Atómica

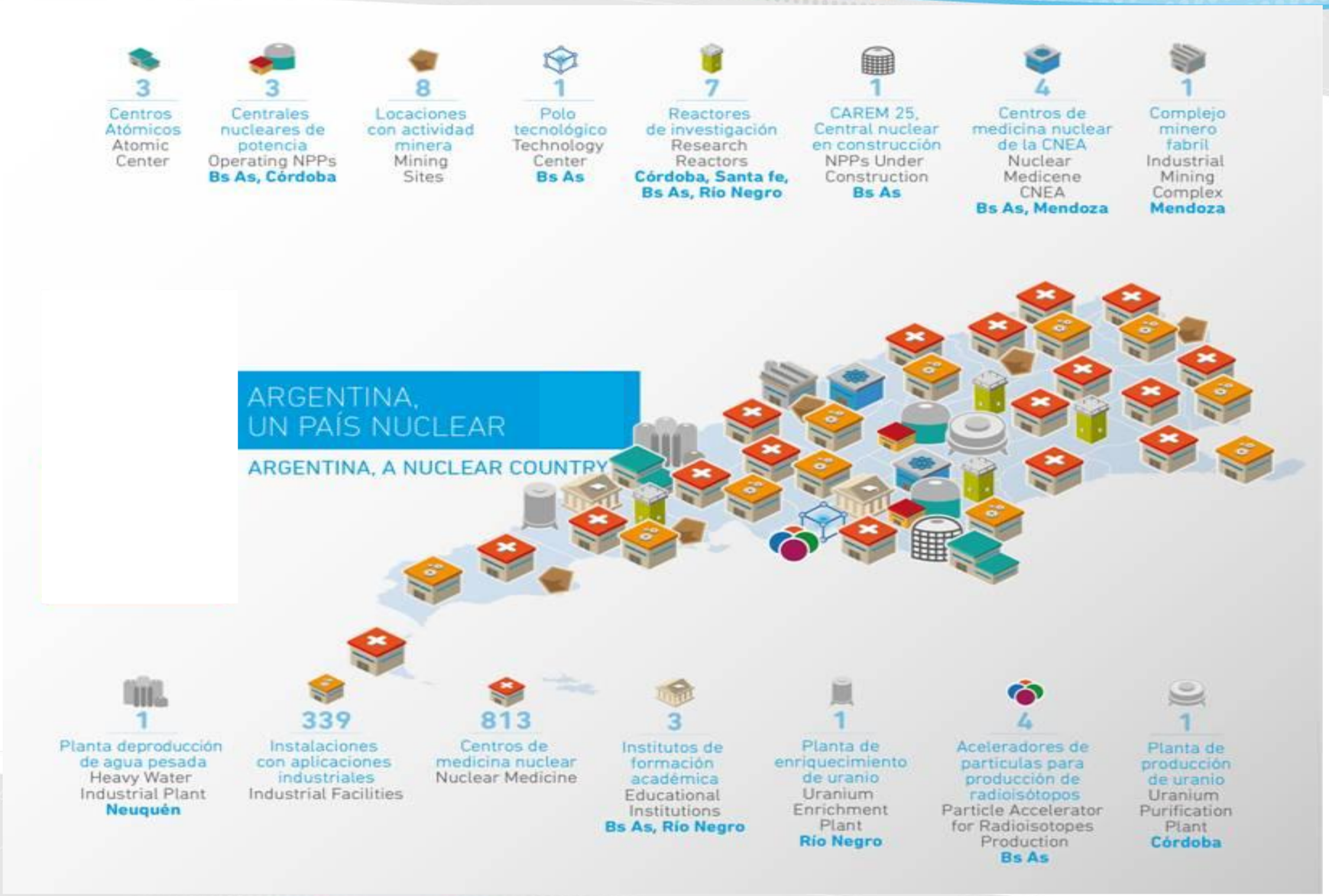
LATIN AMERICAN NUCLEAR ENERGY STAKEHOLDERS´ CONFERENCE

NATIONAL RADIOACTIVE WASTE MANAGEMENT PROGRAM (PNGRR) CNEA

Ing. Elvira Maset

October 25-26, 2016, Buenos Aires,
Argentina

NUCLEAR COUNTRY



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- Nuclear Power Plants
- Research Reactors
- Fuel Cycle facilities
- Heavy Water Production
- Other Nuclear Installations
- Industrial & Medical Radioisotopes
- Educational Institutions
- Nuclear Medicine Centres

NUCLEAR POWER PLANTS

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Embalse

EMBALSE
PHWR - 648 MWe
Operating Since 1984
Life Extention 2016 ~ 2018

Atucha site

ATUCHA II
PHWR
745 MWe
Full power
Since 2015

ATUCHA I
PHWR
357MWe
In Operation
Since 1974

CAREM 25 Mwe
CNEA Design - FoK
Under Construction

ATUCHA III
PHWR - 745 Mwe
Construction begins late 2017

NUCLEAR CENTERS

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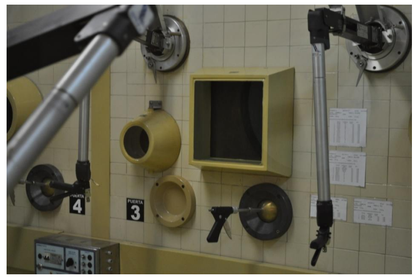
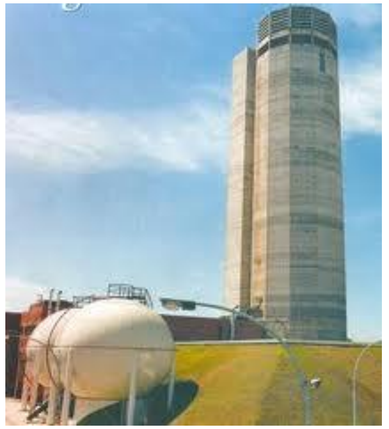
Bariloche Nuclear Research Center (Río Negro)

Ezeiza Nuclear Research Center (Buenos Aires)



Constituyentes Nuclear Research Center (Buenos Aires)



Pilcaniyeu Technological Center (Río Negro)

RESEARCH REACTORS

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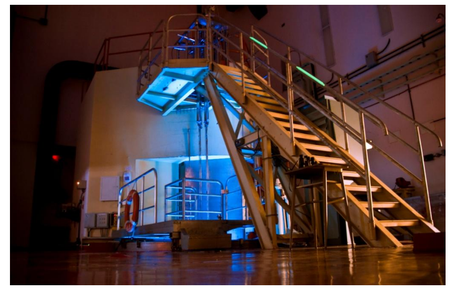
RA1
1957

RA0
1965

RA2
1966
(dismantled)

RA3
1968



RA4
1972

RA6
1982

RA8
1997
(under dismantling)

RA10
2015
(under construction)

MINING SITES

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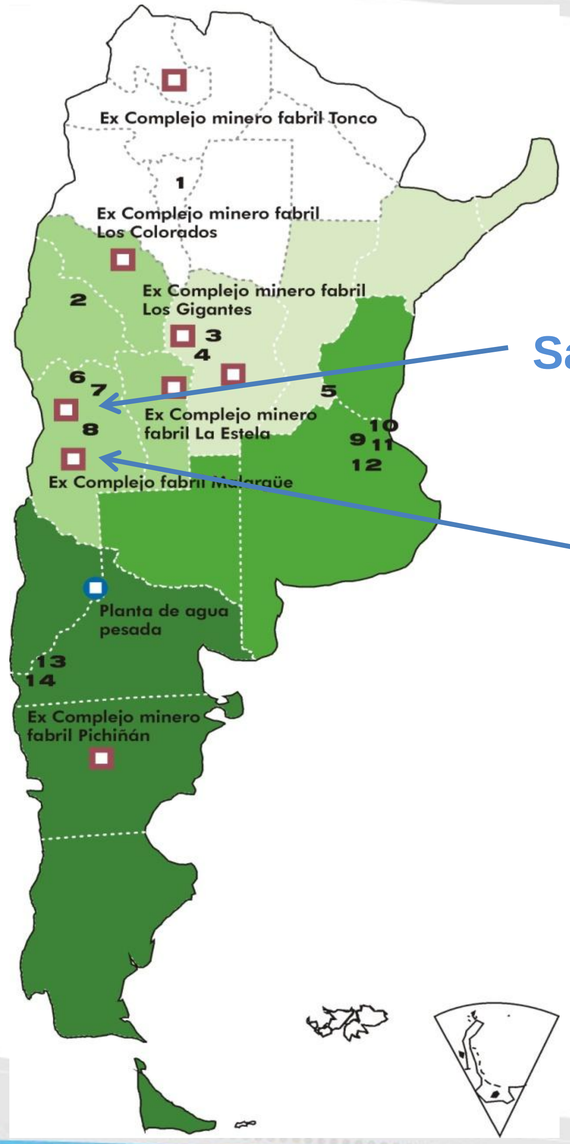
Under Remediation

- Malargüe (Mendoza)
- Huemul (Mendoza)
- Córdoba (Córdoba)
- Los Gigantes (Córdoba)
- Pichiñan (Chubut)
- Tonco (Salta)
- La Estela (San Luis)
- Los Colorados (La Rioja)



San Rafael: to restart operation

Malargüe: Ongoing Remediation Project

NATIONAL RADIOACTIVE WASTE MANAGEMENT PROGRAM (PNGRR)
LEGAL FRAMEWORK

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- National Constitution: Prohibit the import of radioactive waste (1994)
- Decree 1540: Creates the nuclear regulatory body and a state company to operate the NPPs (1995)
- Law Nº 24.804 “Nuclear Activity Law”: Responsibilities division (1997)
- Law Nº 25.018 “Radioactive Waste Management Regime” National Program of Radioactive Waste Management –PNGRR- (1998)
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (enforced since June 2001)
- Law Nº 26.566. Approval of 4th NPP Construction, CAREM Project and Embalse NPP Life Extension (2009).
- Article No. 61 of Law No. 26784, enacted in 2012, revokes Article No. 34 of Law No. 24804, which stated that the nuclear energy generation activity developed by NASA was subject to privatization.

NATIONAL RADIOACTIVE WASTE MANAGEMENT PROGRAM (PNGRR)

MAIN RESPONSIBILITIES

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- Management of radioactive waste and disused sealed sources.
- Management of spent fuel.
- Environmental remediation of closed Uranium mining and milling sites (PRAMU).
- Development of repositories and responsibility for its long term institutional control.
- Research & Development activities.
- Elaboration of the Radioactive Waste Management Strategic Plan –PEGRR- (updated every 3 years)
- Establishment of waste acceptance criteria for the future repositories.
- Records keeping of the inventories of radwaste and other relevant documentation.
- Development of a public communication program. National Reports to the Congress and the JC.
- Ensure safe management in order to protect present and future generations and environment.

NATIONAL RADIOACTIVE WASTE MANAGEMENT PROGRAM (PNGRR)
FUNDING

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- The PNGRR is financed by the National budget, which is approved by the Executive and the National Congress.

- When radwaste or disused sealed source comes from outside CNEA (for instance from industrial or medical applications or nuclear fuel cycle plants) generators should pay the PNGRR for its service.

- For the future final disposal of radwaste there is a Fund established by law to be conformed

SPENT FUEL MANAGEMENT POLICIES AND PRACTICES

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- The National State is the owner of the radioactive fissile material contained in SF. CNEA is responsible of the strategy for the back end of the nuclear fuel cycle and the PNGRR for its final disposal.

- Nuclear power plant operators are responsible for the spent fuel storage on site until its transfer to CNEA.

- Decision on reprocessing of spent fuel is expected to be taken by 2030.

- Embalse NPP: 6-year decaying period in water pools and subsequent interim dry storage in concrete silos.

- Atucha NPP I & II: 15-year decay and storage in water pools. Transference to interim dry storage is under development.

- Research Reactors: Decay in water pools inside the research reactor facilities. Wet storage in a centralized facility.

RADIOACTIVE WASTE MANAGEMENT STEPS

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MAIN STEPS

- SEGREGATION
- CHARACTERIZATION AND CLASSIFICATION
- COLLECTION AND TRANSPORT
- TREATMENT
- CONDITIONING
- FINAL DISPOSAL ← RESPONSIBILITY OF CNEA

INTERMEDIATE STEPS

- INTERIM AND TEMPORARY STORAGES
- LONG TERM STORAGE

EZEIZA RADIOACTIVE WASTE MANAGEMENT AREA (AGE - EZEIZA ATOMIC CENTRE)

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- ✓Characterization and quality verification.
- ✓Storage of LLW, ILW and disused sealed sources.
- ✓ Storage of spent fuels from RA3 and RA1 reactors.
- ✓Treatment and conditioning of institutional wastes.
- ✓ Disposal of LLW from NPP's and institutional wastes till 2001.

CLASSIFICATION OF RADIOACTIVE WASTE

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WASTE CLASS	DISPOSAL SYSTEM	INSTITUTIONAL CONTROL
VERY LOW LEVEL	Near Surface Trench.	50 years
LOW LEVEL	Near Surface Concrete Repository.	300 years
INTERMEDIATE LEVEL	Deep Geological Repository (≈ 500 m)	Not applicable
HIGH LEVEL	Deep Geological Repository (≈ 500 m)	Not applicable

FINAL DISPOSAL OF RADWASTE

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- The PNGRR is responsible for the final disposal of the radioactive waste from all nuclear activities developed in the country.

- According to the last Strategic Plan proposed, the need to count with a Deep Geological Repository is foreseen by 2060.

- Near surface repositories for very low and low level waste are planned to be in operation by 2030.

- Technical activities with reference to this topic are included in the current Research and Development Program. Most of them constitute permanent lines and others must be performed in the future.

REPOSITORY SITING. GASTRE EXPERIENCE

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- Between 1980 and 1990, CNEA conducted feasibility studies for the siting of deep geological repository.

- A suitable granite formation was chosen to start with the first studies. It was located near the town of Gastre (in Chubut Province), in the Central Patagonia.

- Drillings down to 800m were performed.

- Several investigations were performed at the site: photo-interpretation, geological and geophysical characterization of the rock, seismic studies, geomorphologic and hydrogeologic analysis of the area.

- A conceptual engineering design for the repository was prepared.

- Studies were interrupted in 1992, due to public opposition.

- The unsuccessful experience appears every time the repository issue is brought up

REPOSITORY SITING: DIFFICULTIES AND CHALLENGES

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- Federal government and legislative framework distribute responsibilities in the decision making process among national, regional and local governments.
- Many Provincial Constitutions were reformed in the 90's in order to prohibit radioactive waste repositories or even the transportation of radwaste, also many municipalities have been declared "non nuclear territories".
- Integration of the Fund for Final Disposal is delayed and a revision of the funding scheme is under discussion.
- Very strong opposition to nuclear waste disposal by environmental groups and NGO's, influenced by international antinuclear movement.
- Necessity of all stakeholders involvement and political support at all levels to face repositories project development for the sustainability of nuclear energy.

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Thank you for your attention!

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