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Nuclear Waste Governance in Italy

Climate Policy Strategies and Energy Transition

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N Power Policy & Politics: Stop & go for nearly 60 years

Pioneering role in the development of N-power in the '50s; Technology pluralism

Abandonment of N plans after the last NPPP order in 1966. Revival of N power as a late answer to the oil crises

▪ **1973 oil crisis:** PEN 1975 (20,000 MW by 1985 and 40,000 MW by 1990)

▪ **1979 oil crisis:** PEN 1980-81-82 (standard NPP design based on Westh. PWR 312)

1986 Chernobyl desaster: Moratorium on N plans; Referendum; ban on N-power

2008 Revival of N-power debate: Think tank Energy Lab started a feasibility study for the construction of 3-4 NPPs (mostly on existing sites)

2009: Energy Act establishing a Nuclear Regulatory Agency envisages 6 months to select sites for NPPs

2009 New nuclear plans: joint venture between Enel and EdF, *Sviluppo Nucleare Italia* for building at least four reactors using EPWR of Areva

2011 Fukushima desaster: One-year moratorium on N-plans; Referendum (94% of the votes, 55% turnaround) banning plans for new reactors and rejecting N-power

Decommissioning and dismantling activities partly finalised, partly ongoing

Storage of radioactive waste: no real issue?

Mid 90's: ENEL abandoned fuel reprocessing in its own pilot plants and opted for reprocessing abroad and interim dry storage of the remaining SF of its NPPs

Spent fuel shipped to Sellafield for reprocessing. SF not covered by contract with BNFL stored in dry metal casks at Saluggia and in NPPs sites, in facilities not conceived for medium-long term storage. AREVA-Enel Agreement

1995: Designation of a national site for waste disposal has a high political priority.

ENEA performed studies on deep geological disposal and worked out a list of potential sites for LIW.

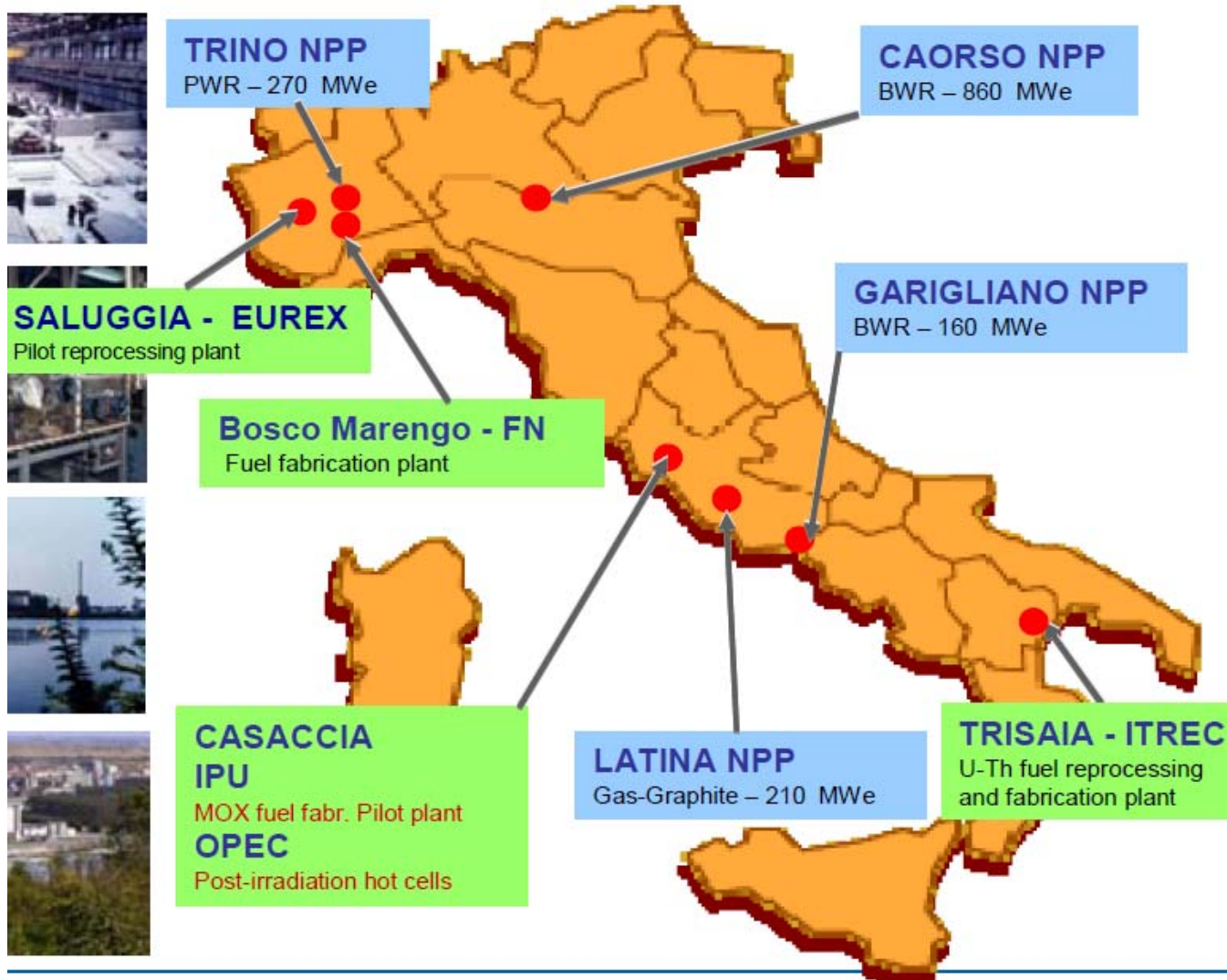
1995: Feasibility study (ENEL) for a central interim storage facility for SF and HLW.

Since public opposition made it impossible to find a suitable site, the strategy followed was to export nuclear waste to the UK or possibly France.

Dec. 1999: New Strategy of the Industry Ministry envisaging:

- ✓ Treatment and conditioning of waste from NPPs currently in onsite storage within 10 years, with the perspective of a successive transport to a national waste repository;
- ✓ Site selection and construction of a national repository for LIW within 10 years.

Location of nuclear facilities



Inventory of radioactive waste to be disposed in a national repository

Volume of waste to be disposed estimated by 71,000 m³

Most of it belongs to **Category II**: low- or intermediate-level waste (LLW) which is considered suitable for near surface disposal.

Inventory of the radioactive waste in Italy as of Dec. 2011

Category waste II: c 26,500 m³ of which

→22,200 m³ LLW

→4,300 m³ VLLW

Category waste I: very low-level waste (VLLW), mainly from medical and research establishments.

Category waste III: c 1,700 m³, including ILW and HLW

Additionally around 30,000 m³ of L-ILW from the decommissioning of nuclear facilities are expected.

c. 200/500 m³ per year from industrial, research and medical facilities.

About 40 m³ of vitrified HLW from reprocessing of SF will be returned (235 t SF reprocessed in La Hague, 20 m³ of vitrified HLW from reprocessed SF in Sellafield)

Financing

Financial resources for radioactive waste management are included in the funds allocated for decommissioning nuclear installations.

Magnitude of **financing and charges** for waste disposal management unknown

The former electricity monopolist ENEL created a fund to cover **long-term liabilities** for **decommissioning** and SF management. The fund (c. € 750 M) was transferred to SOGIN at the time of its establishment (2001).

The costs for the environmental decontamination of nuclear sites is covered through a **levy on the electricity bills**. Every year SOGIN is required to submit its future activities programme, with associated costs. On this basis, the national regulatory Authority for Electric Energy and Gas (AEEG) in charge of tariff policy, evaluates the levy on the price of electricity for the next three years.

A levy corresponding to about 0.03 euro cents per kWh was defined, equivalent to an annual revenue for SOGIN of about € 75 million.

The so called “onere nucleare” (nuclear burden) estimated at around 300/400 M €/year
Every household pays c. 2 € per year.

Legal and regulatory framework

High number of leg. Acts regulating N activities and radioactive waste. Key references:

- Law n° 282/2005 promulgating the ratification of Joint Convention on the Safety of SF Management and on the Safety of Radioactive Waste Management.
- *Law 99/2009* with provisions for the planned renaissance of the Italian nuclear programme and establishing the national Nuclear Safety Agency
- Legislative Decree 31/2010 and subsequent amendments defining:
 - ✓ Steps and timeframes, including public consultation, for the siting procedure of the national site for the LLW repository and for the ILW/HLW long term storage.
 - ✓ A new licensing process for the construction, operation and decommissioning of the nuclear installations, including waste storage sites
 - ✓ Provisions related to the funding of the decommissioning activities
 - ✓ Funding for decommissioning
 - ✓ Compensatory measures for the population of the areas hosting N installations
 - ✓ The siting of the national repository as part of a Technology Park
 - ✓ A public communication programme
 - ✓ Designation of SOGIN as the implementer responsible for the siting, construction and operation of the national repository

Institutional & regulatory framework: major actors

Regulatory authorities

- **Licensing (Waste Disposal):** Ministry of economic development (based on ISPRA advice)
- **Licensing (health and safety):** ISPRA (Institute for Environmental Protection and Research), public institute with administrative and financial autonomy under supervision of the Ministry for Environment, established in 2008 from the former APAT, National Agency for Environment Protection and Technical Services)
- Activities concerning radioactive waste storage and disposal require a concerted agreement of the *Ministries of the Environment, Interior, Labour and Health*
- **National nuclear safety authority:** ISPRA's Nuclear, Technological and Industrial Risk Department (40 staff including inspectors) following the suppression of the Agency for Nuclear Safety as part of the "saving package" of the Monti government in 2012
- **Technical prescriptions and legally binding requirements :** ISPRA
- **Inspection/Monitoring/inventory of radioactive waste and SFI:** ISPRA
- **Enforcement:** ISPRA

Operator/implementing authority:

Siting procedures : SOGIN (approx. 1,000 employees/manages 8 N-sites)

Construction and operation of the national repository : SOGIN

Research: ENEA and research centres/Universities.

National waste management plans/ practice

No repository for category III waste (ILW and HLW).

Waste generated by the operation and decommissioning of nuclear installations is stored in the sites of origin. In each plant, waste is treated, conditioned and stored in temporary structures till their transport to the planned National Repository.

At the end of the decontamination, the temporary storage structures will be checked for residual radioactivity and dismantled. Most of this waste is stored in untreated form, pending treatment and/or conditioning

Regulatory reference on N-waste management: Technical Guide n° 26, issued by ISPRA

Technical standards for near surface disposal facilities:

- ✓ Criteria for qualification of conditioned solid radioactive waste
- ✓ LLW radiological characterisation for near surface disposal
- ✓ Waste package identification procedures
- ✓ Packages and containers for LLW
- ✓ Record keeping in a near surface disposal facility
- ✓ Basic design criteria for an Engineering LLW disposal facility
- ✓ Qualification criteria for the engineering barriers of a LLW disposal facility
- ✓ Monitoring system for a LLW disposal facility.

Concept for a national repository

- A surface repository for ILLW
- An interim storage facility for HLW
- A technology park with a research centre for R&D and innovation in the field of decommissioning and radioactive waste management where the repository will be located.

Surface facility to be designed according to best international practices.

It should provide a permanent placement to approx. 80,000 m³ of L-ILW and a temporary storage of 13,000 m³ of HLW.

Around 70% of the of waste coming from decommissioning nuclear installations; 30% from nuclear medicine, research and industry.

“Transferring the waste into a single structure ensures maximum safety for the population and the environment and will allow for the complete remediation of environmental systems, optimising time and costs and eliminating the need for temporary storage sites” (Sogin website)

Due to the abolishment of the Nuclear Safety Agency, in 2012 ISPRA has been entrusted with the development of a Regulatory Guide on technical siting criteria for the identification of potential area where to realise a LLW near surface disposal facility and an Interim storage for ILW and HLW.

- A first draft of the Regulatory Guide has been prepared
- A process of national and international review is pending.
- Issue of the Guide pending.

Action plans are in progress to enhance the safety level of waste by implementing specific treatment and conditioning projects, by refurbishing existing buildings or by realising new storage facilities on the sites.

Compensation mechanisms

Law n. 368/2003 stated that until the disposal site will be operative, the local municipalities where the nuclear installations are located will receive a **compensation** by an annual fee commensurate to the radiological inventory of the actually stored spent fuel and radioactive waste. SOGIN estimates the number of new jobs connected to decommissioning and creation of a repository in the magnitude of 12,000.

Siting procedures and participation

All attempts to select adequate sites flopped

A “Task Force Site” coordinated by ENEA (1999-2000) prepared a list of potentially feasible sites.

Difficulties with the implementation of L. Decree 368/2003 and 239/2004, esp. in relation to the site identification, due to lacking local acceptance.

2008: State-Regions Working Group

L. Decree 31/2010 entrusts SOGIN with proposing suitable areas for siting.

2010: Identification c. 50 sites on the basis of IAEA criteria and on standards of ENEA task force in 2003 and the State-Regions expert group.
Additional criterion: availability of c. 300 hectares

- Plans envisaged public consultations and involvement of the interested Regions and Local Authorities.
- Ministry of Industry set up a ‘national table’.
- SOGIN organised meetings with local authorities in the designated sites in order to inform about the main strategies.

Time schedule postponed following the Fukushima accident.

Le 52 aree geografiche idonee per lo stoccaggio



Figure’s source: Il Sole 24 Ore, 24.9.2010

Forms of participation: Scanzano

In Nov. 2003 the Region Basilicata was „surprised“ by a gov. Decree enforcing a geological repository in 900 meter depth

Town's underground salt caverns identified by experts as a suitable repository for HILW

Local population not consulted

The choice of the site was very controversial, esp. since in the neighbourhood there is already the Trisaia facility, storing approx. 4,000 m³ liquid and solid wastes

Residents blocked motorways and shut down shops and businesses for two weeks. Approx. 150,000 people marched in the largest demonstration held in the region.

Berlusconi's government forced to withdraw from the decision to make Scanzano the main site for a deep geological waste repository

The government amended the decree regulating Italy's nuclear waste and withdrew Scanzano as the designated site

No al Nucleare in Basilicata
www.noalnucleareinbasilicata.com



Nella scelta del luogo NON è stata consultata la popolazione locale, condannata a vivere con il rischio nucleare sotto casa.



Information policy and participation including civil society



A public communication programme is envisaged by the L. Decree 31/2010 and its subsequent amendments.

Before Fukushima a list of suitable areas were proposed by the implementer/operator SOGIN based upon requirements from the IAEA.

The concept for the procedure foresaw after a preliminary selection a period of 60 days for public consultations. A public presentation through a seminar under participation of the central and local administrations was part of the concept and was entrusted to SOGIN.

In the case of **interest** by **the Regions**, SOGIN would have performed investigations on the site and within 4 months submit a request for authorisation to the Regulatory Body, which would express its judgement within one year.

One single licence (authorisation for construction, operation and closure).

In the case of **lack of interest**, Sogin would submit to the Ministry of Economic Development the list of the potential areas indicating the first three more suitable sites, and within 30 days an inter-institutional Committee would be created, with the participation of representatives from different Ministries and Regions.

Lessons learnt

- Non transparent exercise of power regarding openness, participation, accountability, effectiveness and coherence.
- Reactive policy dictated by external events/ no convincing concepts for participation and dialogue
- Scanzano has set a precedent: siting procedures require an open, democratic process, where stakeholders' interests can be discussed and where both socio-economic and scientific arguments are considered rather than *de lege* enforcement.
- The Italian government's conduct in obvious contradiction with the aimed stakeholder dialogue and public consultation.
- In spite of intentions, top down process and procedures; little/no involvement of local institutional actors
- No acceptance also from municipalities close to a nuclear sites in spite of compensation mechanisms. No success for voluntary Eol
- Incapability of various governments to derive lessons for policy from previous mistakes

Thank you for your attention

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