

International Perspective in Radioactive Waste Management

Claudio Pescatore, PhD
Deputy Head for RWM and D&D



Overview of presentation

- **Part I - The OECD and the NEA**
- **Part II – RADWASTE : a review of developments, expectations as expressed to us and covering 2008-2009**
- **Part III - FINAL OBSERVATIONS**

The Organisation for Economic Co-operation and Development (OECD) - **Strategic Objectives**

- ◆ Promote sustainable ***economic growth, financial stability*** and structural adjustment
- ◆ Improve ***human capital and social cohesion***, and promote a sustainable environment
- ◆ Contribute to ***shaping globalisation*** through the expansion of trade and investment
- ◆ Enhance public and private sector ***governance***
- ◆ Contribute to the development of ***non-member economies***



The 30 OECD Members and Year of Entry

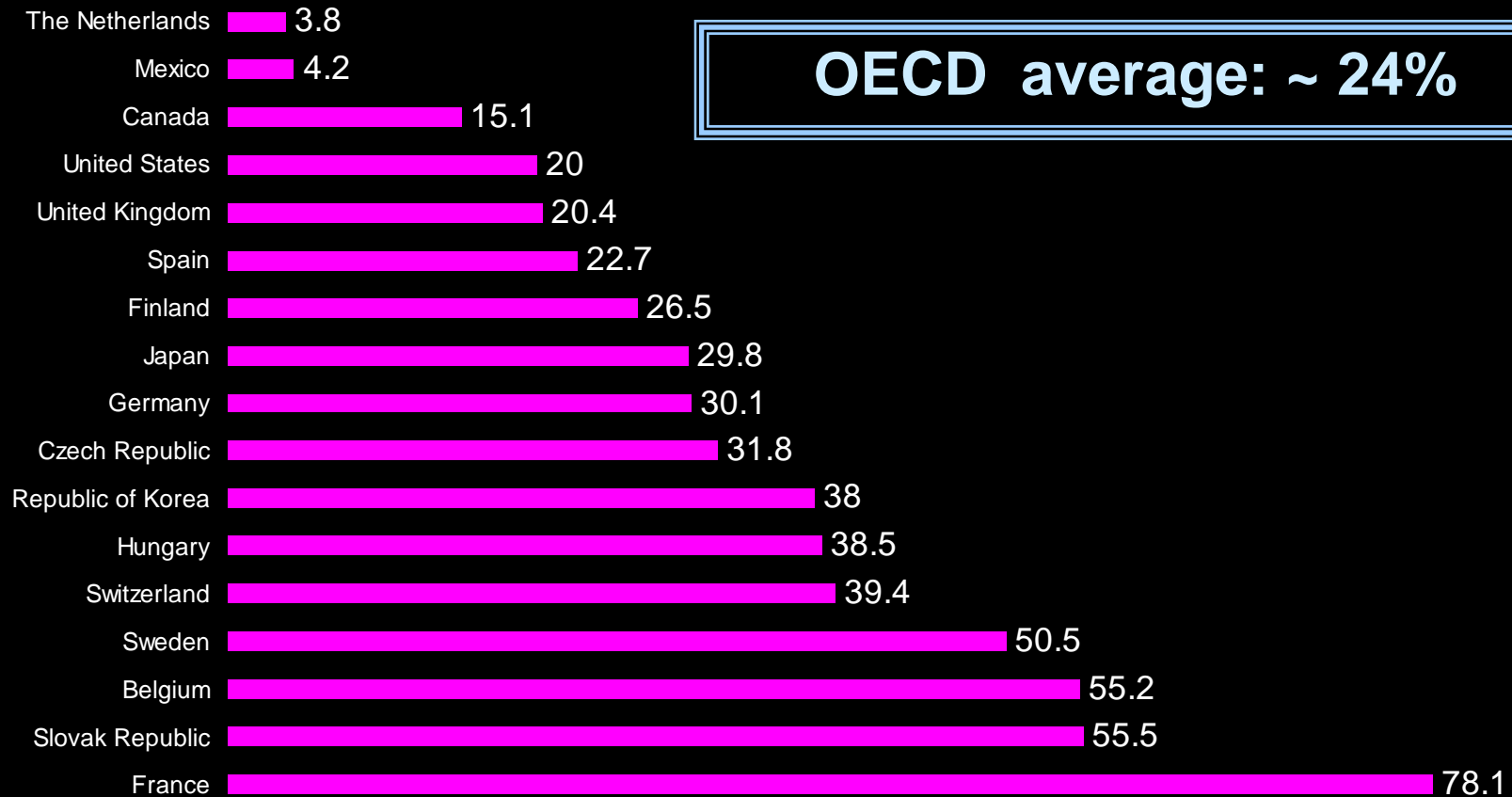
AUSTRALIA:	1971	KOREA:	1996
AUSTRIA:	1961	LUXEMBOURG:	1961
BELGIUM:	1961	MEXICO:	1994
CANADA:	1961	NETHERLANDS:	1961
CZECH REPUBLIC:	1995	NEW ZEALAND:	1973
DENMARK:	1961	NORWAY:	1961
FINLAND:	1969	POLAND:	1996
FRANCE:	1961	PORTUGAL:	1961
GERMANY:	1961	SLOVAK REPUBLIC:	2000
GREECE:	1961	SPAIN:	1961
HUNGARY:	1996	SWEDEN:	1961
ICELAND:	1961	SWITZERLAND:	1961
IRELAND:	1961	TURKEY:	1961
ITALY:	1962	UNITED KINGDOM:	1961
JAPAN:	1964	UNITED STATES:	1961

The OECD Nuclear Energy Agency (NEA)

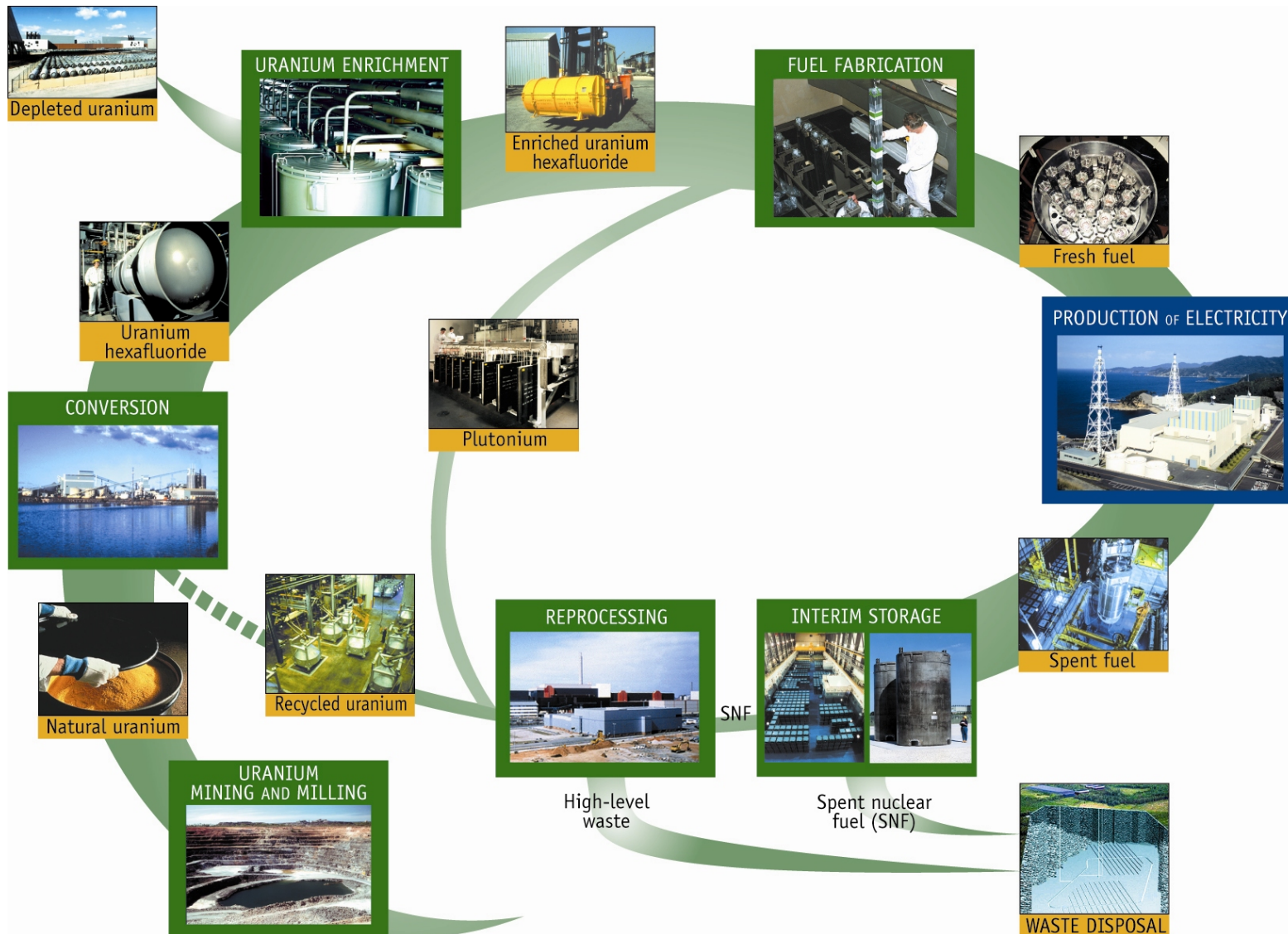
- **28 countries** : all the OECD countries
except New Zealand and Poland

- To assist its member countries ... the **scientific, technological and legal bases** required for the use of nuclear energy
- To provide authoritative **assessments** and to forge **common understanding** on key issues, as **input** to government decisions on nuclear energy policy, **and** as input to broader OECD policy analyses

Nuclear Share in Electricity Generation of OECD Countries in 2004 (%)

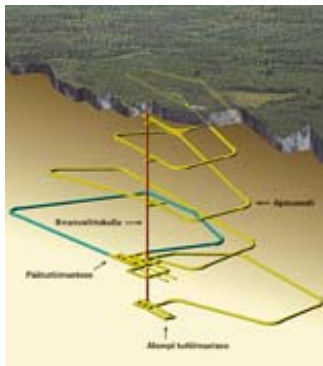


Source: NEA 2005



Management of Radioactive Waste and Materials - Goal

Assist members in the area of management of radioactive waste and materials, focusing on the development of strategies for the safe, sustainable and broadly acceptable management of all types of radioactive waste, and in particular **long-lived** waste, and spent fuel



RF-Workshop Indications on International Guidance – some findings

- International guidance is interpreted in different ways in each country, there is still a need for clarification of fundamental terms such as “undue burden” or “safety”
- Reasonable consensus on fundamental objectives, but much less consensus on practicable criteria: e.g. how to demonstrate the provision of safety for people living in the distant future
- The debate about how to protect people and the environment in the far future on the same safety level as at present is still going on.

RF-Workshop Indications on long times frames for protection

- **More discussion is needed on time cut-offs for compliance and weighting short term protection vs. long term protection**
- **There is a growing consensus to introduce different time periods, and to use of dose and risks as *indicators* of protection in the long term. Particularly the use of these indicators and how they should be interpreted, and considering limitation on accuracy and reliability, should be clearly communicated**

Milestones, Developments and trends in NEA Member Countries *(data from March 2008 to March 2009)*

From March 2009 meeting of RWMC

Korea

- The formation of a new national radioactive waste management agency in 2009: Korea Radioactive Waste Management Corporation (KRMWC).
- Plans for a national debate to determine the policy for the management of SF.
- The full operation of a new LILW disposal center foreseen in 2010.
- A new dry storage facility for (CANDU) SF beginning in 2009.
- Changes in the fuel cycle in terms of enrichment and burn-up, along with a detailed database on SF inventory and characteristics and a very active research programme, supporting the development of geological disposal for HLW.
- Decommissioning activities and management of the resulting waste

Milestones and Developments (1)

- Licensing, expansion and re-licensing of LILW waste disposal facilities: Czech Republic, Hungary, Spain, US
- Licensing of NORM disposal facility in Norway
- New or re-organized regulatory bodies in several countries: Italy, Sweden, Switzerland
- Framework and first steps taken for step-wise, voluntary siting process for geological repositories: Switzerland, **UK**
- **Six siting regions for repositories announced in Switzerland. First step to be completed in 2011.**
- Update regulatory policy for SF repository in Finland, and a new plan for the preparation of the licensing Safety Case (Safety Case Plan 2008).
- Final safety regulations and license application for Yucca Mountain, US

Milestones and Developments (2)

- **Expressions received (by March 2009) from three local authorities in West Cumbria, UK, to start discussions on deep repository siting/hosting**
- **Expressions of interest for hosting long-lived LLW disposal facility in France - *Government decision expected in June 2009 on preferred candidate sites***
- **License application for centralized storage facility in Slovak Republic**
- **New laws and major regulatory changes in Spain related to environmental impacts, safety of all nuclear installations, and requirements on waste storage facilities**

Expected Events in 2009 (1)

- ▣ **Site selection for HLW geological repository in Sweden**
- ▣ **Final safety regulations for HLW disposal in Germany**
- ▣ **Proposal of siting process for implementation of HLW repository in Canada**
- ▣ **Re-start site characterization processes for HLW repository in Czech Republic**
- ▣ **Start of national dialogue for HLW repository in Belgium**
- ▣ **Designation of 2-3 sites for further investigation for long-lived LLW disposal facility in France - *Difficulty has been encountered***
- ▣ **Dialogue workshop in the HLW repository area (NEA); Designation of a “zone of interest” for HLW repository in France (from 250 to 30 Km-sq) ;**

ZONE D'INTÉRÊT POUR UNE RECONNAISSANCE APPROFONDIE (ZIRA)



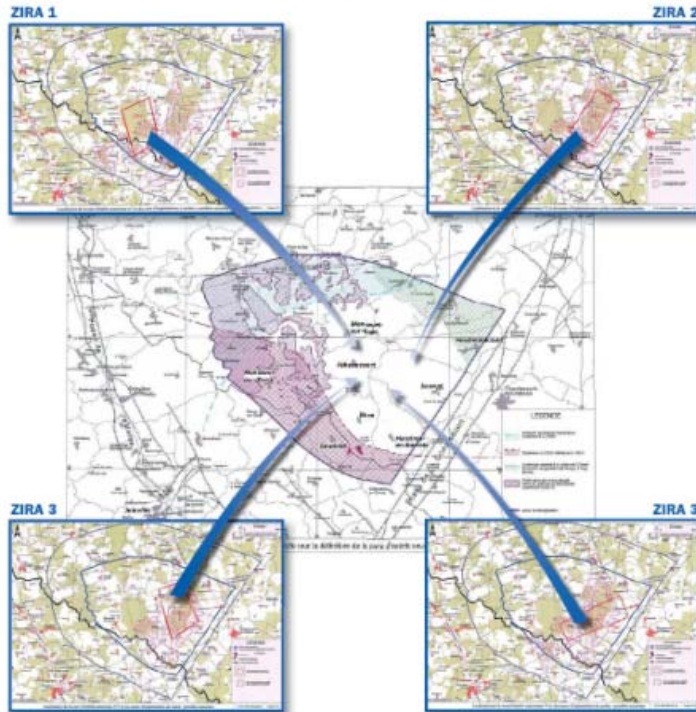
Le CLIS souhaite mettre à la disposition du grand public les derniers éléments d'information concernant la démarche de l'ANDRA pour déterminer les **ZIRA (Zone d'Intérêt pour une Reconnaissance Approfondie)** de 30 km². Des études complémentaires y seront mises en œuvre avant de proposer la localisation exacte du stockage, si celui-ci est décidé. La démarche a été présentée aux élus concernés et aux acteurs socio-économiques des départements de la Meuse et de la Haute-Marne, ainsi qu'aux membres de la commission «Localisation» mise en place par le CLIS (voir p.4).
Les **critères** qui ont permis de définir la zone de transposition restreinte (partie blanche) sont **géologiques** (profondeur et épaisseur de la couche d'argile, éloignement des failles régionales) et **hydrauliques**.

Les ZIRA ont été implantées dans ce périmètre en tenant compte de contraintes de surface retenues par l'ANDRA après rencontre avec les élus :

- superficie d'au moins 200 hectares en continu,
- éloignement des zones habitables,
- implantation sous les forêts,
- infrastructures de transport (routes, voies ferrées et navigables),
- zones inondables,
- périmètres de captage des eaux,
- zones Natura 2000,
- monuments historiques ou classés,
- zones aériennes militaires.

Le CLIS sera attentif à ce que la ou les ZIRA proposée(s) par l'ANDRA au gouvernement (d'ici l'automne 2009) répondent à tous les **critères de sûreté à long terme**, et plus spécialement les **critères géologiques**.

L'ANDRA envisage deux zones en surface, l'une à la verticale du centre de stockage, l'autre pouvant être éloignée de 5 km maximum, avec une descenterie (rampe d'accès au centre), selon le schéma ci-dessous montrant les installations souterraines et de surface.



De gauche à droite : accueil d'une délégation allemande, formation des membres, visite du laboratoire.



Expected Events in 2009 (2)

- ▣ Announcement of site selection process for a centralized SF storage facility in Spain
- ▣ Development of national strategy for all types of RW in Poland
- ▣ Continuation of process for expressions of interest for UK geological repository
- ▣ Further information on path forward for HLW repository in US
- ▣ Application for renewal of the license/certification for operation of WIPP TRU repository in US
- ▣ Preparation of license application for LLW in Belgium (to be submitted in 2011)
- ▣ 3rd Meeting of the Joint Convention (May 2009)

Trends (1)

- **Expansion of nuclear power and “new build”**
- **National waste management plans**
- **Clarifying the regulatory framework**

Trends (2)

- **Conceptualisation and implementation of “volunteer” siting strategies**
- **Vigorous efforts at public information and dialogue to encourage participation by municipalities and regions in siting processes**

Trends (3)

Meanwhile.....

- ▣ **Development and expansion of interim SF storage facilities, both on-site at NPPs and centralised**
- ▣ **Reviewing and updating funding schemes to ensure sufficient financing for eventual disposal**

Trends (4)

- **Waste conditioning and treatment seems to be a higher priority**
- **Methods to reduce quantities of conditioned waste sent for long-term storage and disposal**

Challenges (1)

- **Pending Political Decisions**
- **Organizational Evolution or Transition**

Challenges (2)

- **Continued Need for Storage**
- **Waste Disposal Capacity Limitations**
- **Legacy Site and Historic Waste**

Challenges (3)

- ▣ **Building technical capacity and retaining qualified personnel**
- ▣ **Integration of information and knowledge management**
- ▣ **Societal dialogue and public acceptance**

Geological disposal

Key messages from NEA RWMC (collective statement)

KEY MESSAGES

- ◆ **Storage is being implemented successfully, but it is no substitute for waste disposal**
- ◆ **There are no miracle solutions that would eliminate the need for final disposal**
- ◆ **Geologic disposal is technically feasible and affords unparalleled protection**
- ◆ **Satisfactory safety cases to support decision making are a working reality**
- ◆ **The experience and data from RD&D is wide and pertinent**

KEY MESSAGES

- ◆ **An international framework (ICRP, IAEA) exists for achieving an appropriate level of protection**
- ◆ **First step in the strategy for ultimate WM (disposal) is the definition of a national energy policy that addresses the role of nuclear power and in which the waste arisings are recognised**
- ◆ **Need for national plan with a vision for the final management of all types of radioactive wastes**
- ◆ **Decisions need to be prepared with stakeholder involvement and taken sequentially. Long implementation times are both challenge and opportunity.**

KEY MESSAGES

- ◆ **Retrievability and reversibility need to be defined in each national program**
- ◆ **What works in one country may not be as effective in another**
- ◆ **Cultural, societal, and geographical similarities and differences have resulted in a variety of paths, but common safety and security objectives underlie these paths in national waste management solutions**

OVERALL: RADIOACTIVE WASTE MANAGEMENT AND DECOMMISSIONING (1)

- ◆ **Cannot be considered as being solely a technical issues to be resolved solely by technical specialists**
- ◆ **Failure to recognize this has led to significant delays in waste management and in some decommissioning programmes**

.. And GEOLOGICAL DISPOSAL

- ◆ **...is moving forward...**
- ◆ **...but progress needs to be consolidated... a “wait and see strategy” is contrary to safety and ethics**
- ◆ **... take stepwise decision making seriously ...in most countries, regional levels are nowadays as important as national levels**