International Atomic Energy Agency

The IAEA's Role in the Development of Multilateral/Regional Cooperation Opportunities for Radioactive Waste Repositories

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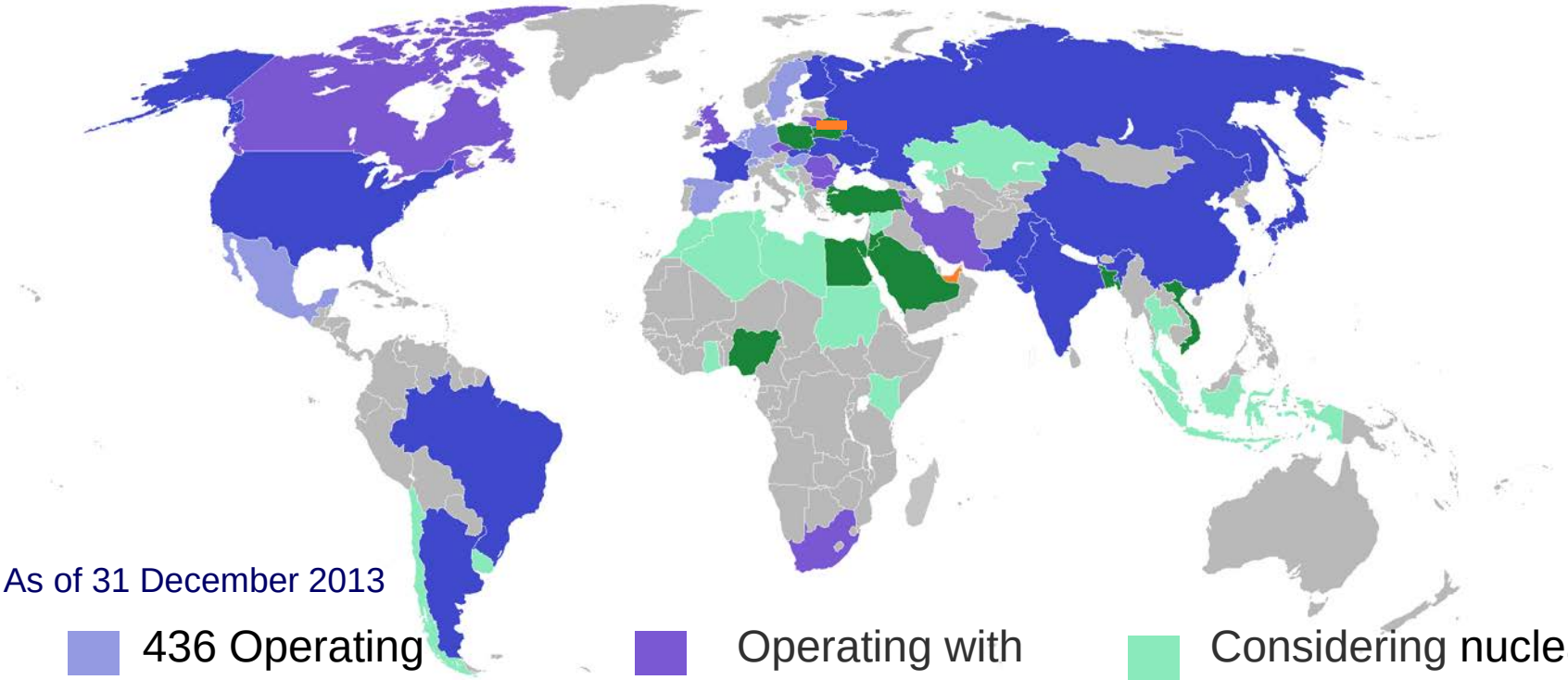
Content

- The context and case for the development of multinational disposal facilities
- IAEA responsibilities, priorities and support
- Challenges

Nuclear power supply today



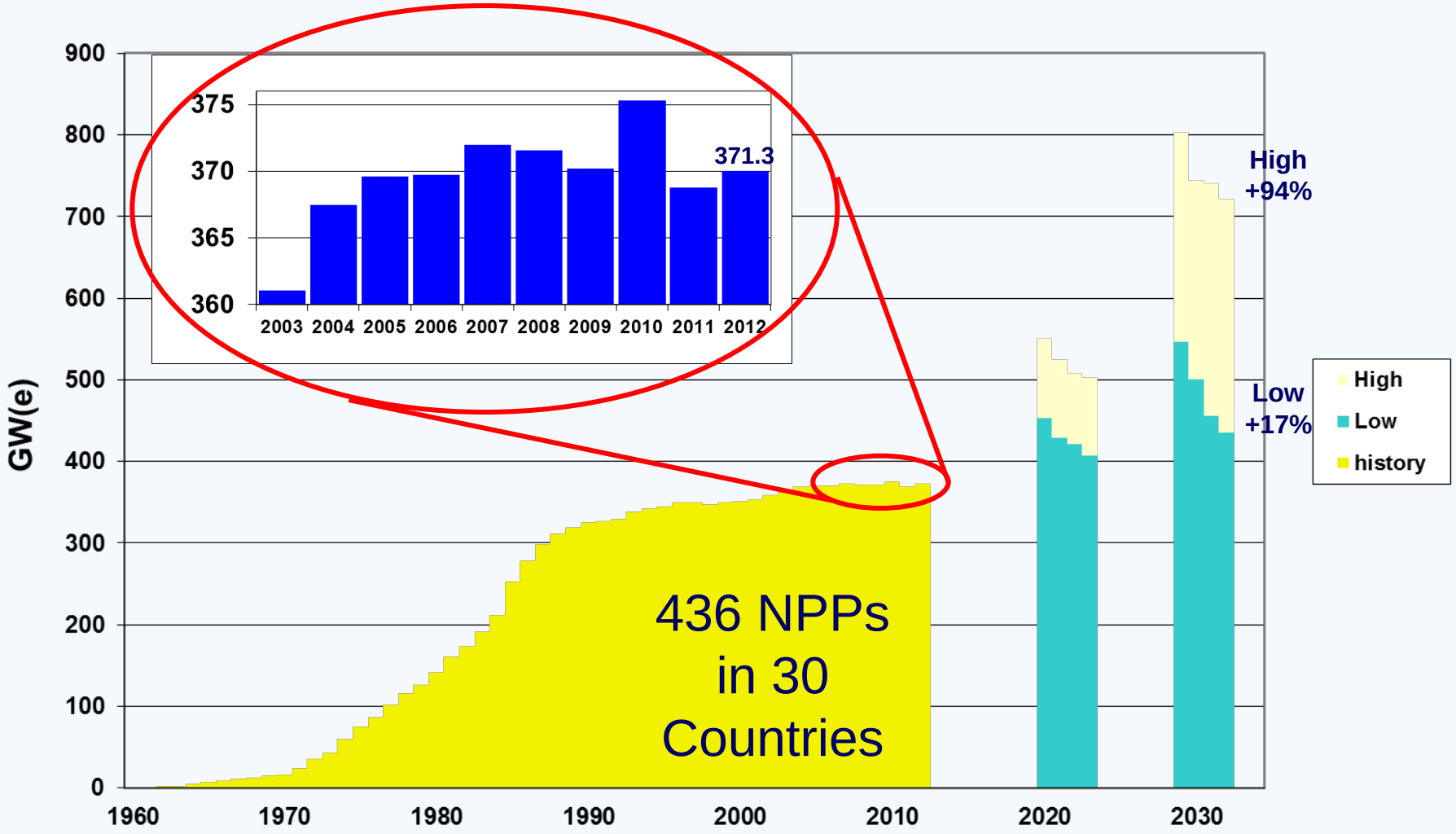
As of 31 December 2013

- 436 Operating nuclear power reactors
- Operating and Constructing
- Operating with plans to expand
- 1st NPP Under Construction
- Considering nuclear power introduction
- Decided to introduce nuclear power

Post Fukushima: Unchanged drivers

- **Global energy demand is set to grow**
  Nuclear power expands supply options
- **Environmental pressures are rising**
  Nuclear power has low life-cycle GHG emissions
- **Energy supply security back on the political agenda**
  Nuclear power contributes to energy security
- **Reliable base load electricity at predictable and affordable costs**
  Nuclear power offers stable and predictable generation costs based on low resource costs

RDS#1 2013, the Agency's Yearly Projection



Some IAEA Priorities in RWM

- **IAEA is required by its statute to promote international cooperation and the exchange of information, knowledge and understanding for the peaceful use of nuclear energy.**
- **Ensuring appropriate policies and strategies are in place for the management of RW**
- **Development of International Safety Standards**
- **Managing Technical Cooperation projects to increase capabilities and the capacity to manage RW in Member States**
- **Establishing international networks (URF, DISPONET, etc.) to facilitate cooperation between Member States**

IAEA Assistance

- **Currently more than 80 TC projects related to RWM in 37 countries and in all regions**
- **In RWM required assistance mainly related to waste processing, storage and disposal of LLW**
- **Assistance related to geological disposal of SF and HLW mostly focused on development of adequate policy and long-term strategy/programme for SF/HLW**
- **In remediation area support is requested for development of necessary infrastructure for implementing projects and preparation of plans**
- **In decommissioning assistance required mainly to prepare decommissioning plans and cost estimates**

Why Might Member States Consider Regional Cooperation

- Increase in the number of countries considering the nuclear power introduction
- Newcomers in the same region have similar challenges that need to be addressed within similar time scales
- Regional Cooperation can reduce initial capital investment through the potential sharing of infrastructure and human resource capabilities
- Multinational disposal solutions may be more acceptable to the general public

Potential Advantages of Sharing Resources and Infrastructure

For Government:

Research and development, Human resources, Education and training, Finance, Economics of Nuclear Power, Grid system…

For Operator/ Owner:

Plant operation and maintenance, Operational experience feedback, Spare part management, Fuel management, Radioactive waste management

For Industries and Vendors

Engineering and safety assessment, Manufacturing, Construction and erection, Commissioning, ISI, Procurement, Vendor qualification

Prerequisites for Regional Cooperation

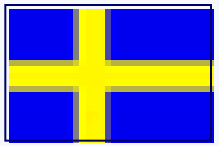
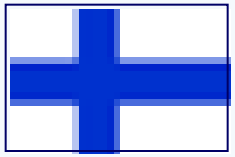
Common understanding between potential partners on:

- **National responsibilities**
- **International Issues and implications**
- **Pros and cons on sharing infrastructure**
- **Lessons learned in other regions or other infrastructure**
- **Status and expectation of partners**

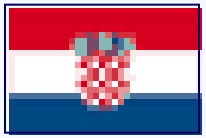
Examples of sharing Nuclear Infrastructure

- Sharing of commissioning and operation services of NPPs between Utilities in Brazil and Argentina


- Sharing of R&D Projects for Spent Fuel Disposal between Sweden and Finland

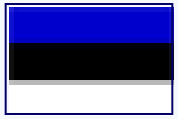



- Sharing of NPP operation (Krsko) between Slovenia and Croatia

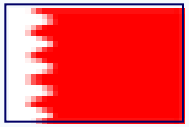


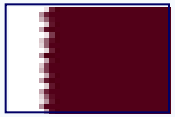

- Regional approach for the introduction of NPP
  - Cooperation among Baltic countries



  - Gulf Cooperation Council (GCC) Project

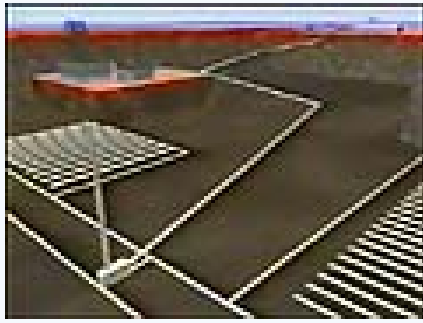

Sharing Nuclear Disposal Facilities - Challenges for a Member State -

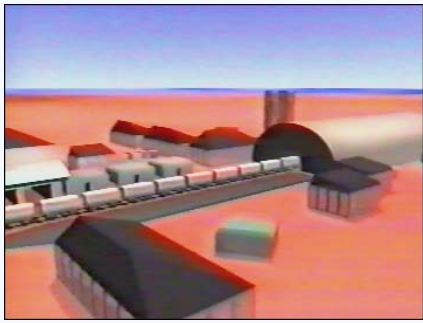
- ***Possible delay in planning and implementation due to the need for coordnation between partners, or conflict of requirements of common services or resources***
- ***Possible adverse effects generated by political or economic instability in the region***
- ***Possibility of partner's withdrawal***
- ***Public resistance***
- ***Political "strings"***
- ***Limited access to necessary information due to the sensitive and strategic nature of nuclear technology***
- ***Additional transportation of SF/ RW and associated issue for sharing SF/RW related activities***

Regional/international initiatives in fuel back-end

- Majority of initiatives related to disposal of SF and HLW
- Main driving forces:
  - Security and environmental safety, non-proliferation
  - Economics and finance
  - Technical issues

- Pangea's proposal for commercial world's nuclear repository in W Australia end of 90-ies
- 2002: Arius association to promote and develop the concept of shared facilities for storage and disposal of long lived waste
- 2003: European project SAPIERR – Support Action on Pilot Investigations on EU Regional Repositories
- 2009: ERDO Working Group for European repository development organization





Pangea model of geo. disposal

IAEA Position on Multinational Repositories

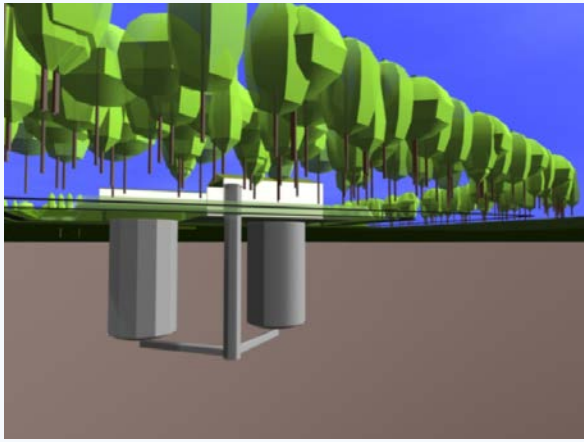
Joint Convention – Preamble

Convinced that radioactive waste should, as far as is compatible with the safety of the management of such material, be disposed of in the State in which it was generated, whilst recognizing that, in **certain circumstances**, safe and efficient management of spent fuel and radioactive waste might be fostered through agreements among Contracting Parties to use facilities in one of them for the benefit of the other Parties, particularly where waste originates from joint projects;

JOINT CONVENTION ON THE SAFETY OF SPENT FUEL MANAGEMENT AND ON THE SAFETY OF RADIOACTIVE WASTE MANAGEMENT

One other dimension to the discussion……..

A concern addressed in the Joint Convention:



• Article 27: Transboundary movement

(iii) a Contracting Party which is a State of destination shall consent to a transboundary movement only if it has the administrative and technical capacity, as well as the regulatory structure, needed to manage the spent fuel or the radioactive waste in a manner consistent with this Convention;

(iv) a Contracting Party which is a State of origin shall authorize a transboundary movement only if it can satisfy itself in accordance with the consent of the State of destination that the requirements of subparagraph (iii) are met prior to transboundary movement;

IAEA's General Position Regarding Multinational Repositories

- The IAEA is supportive of the idea, but also cautious
- Emphasis is placed on the need for national responsibility. This includes the need to establish national back-end management plans, part of which would be a coherent national disposal policy and a strategy to implement it.
- National plans should be predicated on solutions that are available today. However, given the long time scales involved, dual track strategies may be considered.
- **IAEA will assist Member States, upon their request, to inform on considerations relevant to the development of multinational cooperation.**

IAEA documents addressing multilateral issues

Multinational disposal: Further issues

Many countries with, or considering, nuclear power programmes have introduced a ban on RW import

Some advanced programmes (were) afraid that their national programmes would be jeopardized or that multinational solutions are not “ethical”.

Concern that multinational initiatives may be used as an excuse to remain inactive in searching for disposal solutions (“wait and see” or place the burden on the international community)

Political and societal decisions and support – is it realistic to expect agreement now or in the future?

Small programmes are interested in principle but no serious commitment and no interest expressed to host a repository

In summary……..

- There has been significant progress worldwide in the management and disposal of RW.
- However, and in spite of recognized benefits, no real progress in sharing repositories among established nuclear programmes because:
  - Initiative is limited mainly to geological disposal (GD)
  - Time distant plans for GD – no time pressure for action now
  - No national GD implemented yet
  - No real political support
  - Negative public perception (?)
- But:
  - Newcomer countries are developing nuclear power programmes (national drivers)
  - Concerns about proliferation as well as safety and security concerns (international drivers)

- Therefore, of paramount interest and importance it will be essential for the IAEA to support:
  - Licensing and construction of first geological repositories
  - Establishing sound RWM policies and strategies in all MS
  - Ensuring all MS fully understand their national back-end responsibilities, develop the capabilities and capacity to address them and can provide the needed resources to do so
  - The prevention of a “wait and see” or a “*the international community will take care of it*” approach to RWM

- **Developments focused on multinational approaches to disposal should remain consistent with these principles**