

# International R&D and Collaboration

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Presentation to NUSAC 2 October 2007



# Overview

- Introduction
  - EU Funded R&D
    - 6<sup>th</sup> Framework Programme
    - 7<sup>th</sup> Framework Programme
  - Bi/Multilateral R&D
  - Cost benefit
  - Other Collaboration
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# EU Funded R&D

- 6<sup>th</sup> Framework Programme (FP6)
  - 2002-2006
  - Euratom €190m
    - Radioactive Waste Management - €90m
      - Geological Disposal
      - P&T
    - Radiation Protection - €50m
    - Other Activities (nuclear safety, education and training, nuclear innovation) - €50m
  - 77 projects

# FP6 (1)

- CARD (2006-07) - EC €350k
  - Feasibility of Technology Platform under FP7 for R&D in geological disposal
  - Transfer of knowledge to less well advanced Member States
- CATT (2006-07) - €250k (EC €210k)
  - Feasibility of Technology Transfer to less well advanced Member States
- PAMINA (2006-2009) - €7.6m (EC €4m)
  - Harmonise integrated performance assessment

# FP6 (2)

- COWAM IN PRACTICE (2007-10) - €1.5m (EC €0.8m)
  - through Galson Sciences, Westlakes
  - implementation of best practice in stakeholder engagement and governance
- FUNMIG (2005-08) - €15m (EC €8m)
  - 51 partners!
  - Fundamental knowledge of migration
- ESDRED (2004-09) - €18m (EC 7.3m)
  - Engineering Studies and Demonstrations of Repository Designs

# FP6 (3)

- NFPRO (2004-07) - €18m (EC €8m)
  - 40 organisations
  - Near-field processes
- REDIMPACT 2004-07
  - Impact of Partitioning, Transmutation and Waste Reduction Technologies on the Final Waste Disposal Project

# "Clubs"

- AMIGO
    - Approaches and Methods for Integrating Geological Information in the Safety Case
  - Clay Club
  - BIOPROTA – This is an international forum to address outstanding uncertainties of relevance to biosphere research
  - Expert Group on Argillaceous Media (Clay Club)
  - Expert Group on Radionuclide Migration in Geologic Media (GEOTRAP)
  - Club of Agencies
    - All EU Member States WMO's
    - DG RTD
    - DG TREN
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# Other R&D

- Thermochemical Database (TDB)
  - Database of selected chemical elements
- Sorption Project
  - Chemical thermodynamic modelling approaches to support the selection of sorption parameters
- AMIGO
  - Approaches and Methods for Integrating Geological Information in the Safety Case
- Engineered Barrier Systems
  - Account of how EBS design is developed, justified and implemented
- CARL (2004-07)
  - WMOs, regulators, Swedish communities
  - looking at decision-making processes

# Other R&D

- Cellulose Degradation
  - document current knowledge of the long-term degradation rate of crystalline cellulose
- LASGIT 2007-08
  - large-scale gas injection test in a full-scale KBS-3 deposition hole
- TEM (Nagra)
  - Test and Evaluation of Standard Monitoring Techniques

# FP7

- Euratom €2.75Bn 2007-2011
  - Fusion €1.95bn (includes ITER)
  - Nuclear Fission & Radiation Protection €287m
  - JRC €517m
- (FP7 €50Bn over 7 years)
- Management of radioactive waste
  - Geological Disposal
  - P&T
- Reactor systems
- Radiation protection
- Infrastructures
- Human resources, mobility and training

# FP7 WMO Strategies

- Geological disposal
  - implementation oriented R&D
  - demonstration technologies
- Await outcome of some FP6 projects before proposing new work on PA and EBS
- Support for gas research
- Technology demonstration
  - monitoring, shaft-sealing, backfilling etc.
- CARD
  - network of URLs
- “Carbowaste”
  - cross-cutting project to develop database of irradiated graphite characteristics

# Collaboration agreements

- USDOE
  - Decommissioning, clean-up, repositories
- Japan
  - JAEA (draft), NUMO, RWMC
- France
  - Andra (draft), EdF
- SKB (Sweden)
- NAGRA (Switzerland)
- ONDRAF/NIRAS (Belgium)

# Collaboration benefits

- Application of best practice
  - benchmarking cost models
  - technology readiness
  - staff exchanges
- HLW and spent fuel disposal concepts
  - saving of between £5-10m per year
- £1.1m gives access to £40m R&D