HLW REPOSITORY OPTIMISATION INCLUDING CLOSURE (OPTI)

An overview

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HLW REPOSITORY OPTIMISATION INCLUDING CLOSURE (OPTI)

- **The need of optimization is justified by the long running character of repository projects and thus by expected changing boundary conditions (e.g. new waste types), evolution of technology and/or the adaptations of processes due to operational experiences**
- **Optimization is a process that shall involve all stakeholders of a RWM programme**
- **Develop a mutual understanding and provide recommendations about methodologies and further activities for design and optimization of specific HLW deep geological repository systems, structures and components (SSCs) and procedures.**
  - Organise interactions between the EURAD actors (civil society included) about optimization of HLW GDF
  - Develop a mutual understanding of the different actors views about what optimization for a HLW GDF means
  - Identify the main technical or socio-technical challenges associated with the optimization of HLW GDF

PARTICIPATING ORGANIZATIONS

CS

NTW NUCLEAR TRANSPARENCY WATCH

WMO

BGE BUNDESGESELLSCHAFT FÜR ENDLAGERUNG

Posiva

PURAM

nagra.

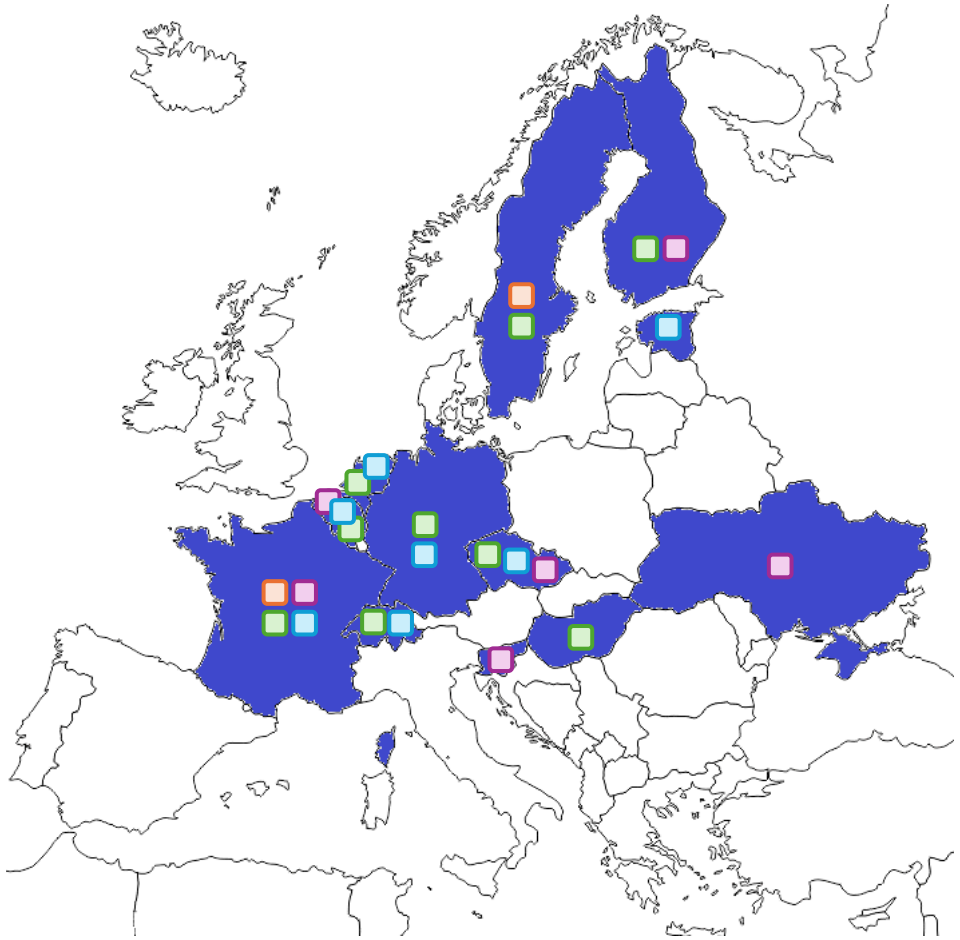
ONDRAF/NIRAS

COVRA

SKB

ANDRA

SÚRAO SPRÁVA ÚLOŽIŠŤ RADIOAKTIVNÍCH ODPADŮ



TSO

SÚRO

BEL V

SSTC NRS STATE ENTERPRISE STATE SCIENTIFIC AND TECHNICAL CENTER FOR NUCLEAR AND RADIATION SAFETY

ASNR

EIMV ELEKTROINŠTITUT MILAN VIDMAR

VTT

RE

TU Delft

EURIDICE

LIÈGE université

sck cen

ÚJV

CTU CZECH TECHNICAL UNIVERSITY IN PRAGUE

TARTU ÜLIKOOL 1632 UNIVERSITAS TARTUENSIS

KIT Karlsruher Institut für Technologie

PAUL SCHERRER INSTITUT PSI

The WP includes 25 partners from 12 countries (BE, CH, CZ, GER, FR, SE, FIN, NL, HU, SI, EST, UA)

eurad 2

WP DESCRIPTION

- **Task 1 – Management and Coordination (Philipp Herold, BGE)**

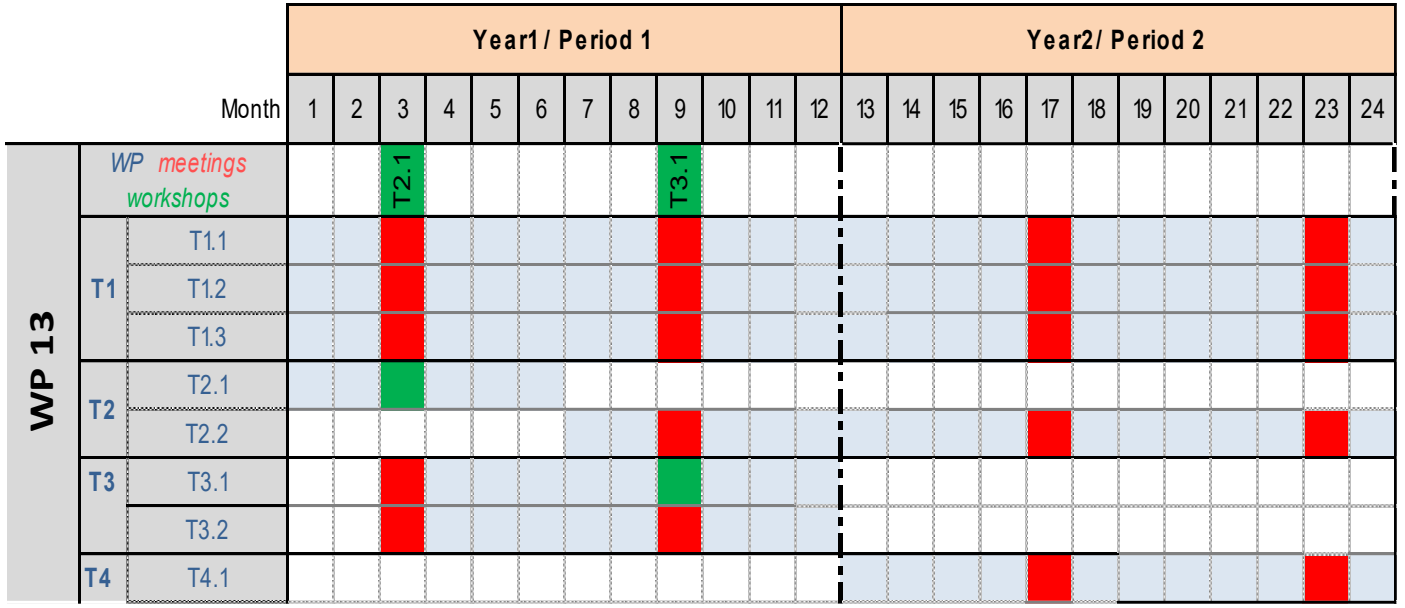
- **Task 2 – Knowledge Management (Anne-Catherine Dieudonné, TU Delft)**
  - Subtask 2.1 – Knowledge capture
  - Subtask 2.2 – Knowledge Transfer

- **Task 3 – Mutual Understanding (Valery Detilleux, BEL V).**
  - Subtask 3.1 - Workshop to build mutual understanding
  - Subtask 3.2 - Case study

- **Task 4 – Identification of Key Challenges for Optimization (Jiri Svoboda, CTU)**

SCHEDULE

- **Strategic Study – duration two years**
  - WP meeting n°1 in Hannover, November 2024 (parallel to Clay Conference)
  - WP meeting n°2 in Prague, June 2025 (combined with workshop n°2)



TASK 2

Knowledge Capture

- Initial workshop
- Green Paper to capture the actor views
- Contribue to DI 5.1.1

Knowledge transfer

- Interaction with civil society - ICS Workshop N°1
- EURADWASTE – poster contribution
- Next Week: SafeND – presentation and poster contribution

WORKSHOP N°1 (TASK 2.1)

Why is optimization needed?

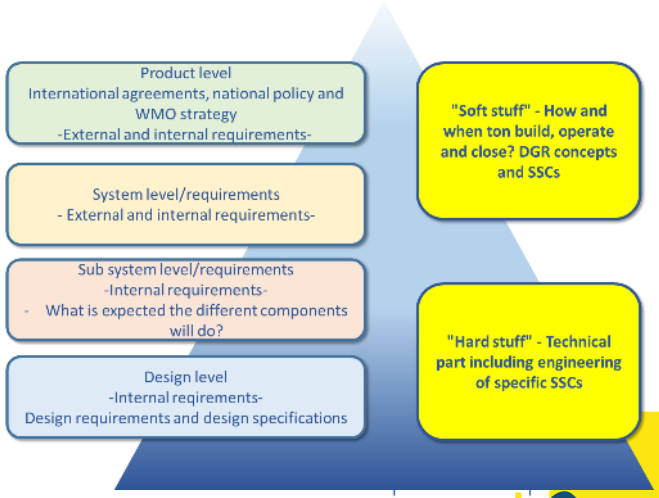
- Because it is required by the Safety requirements / regulatory framework
- Because of long the time frames related to the project, this is particularly important (e.g. technologies will evolve and permit optimisation)

How to optimize?

- Holistic understanding of the system, Iterative and dynamic process, Comparison, Benchmarking, Multi Criteria Analysis, regular Safety Case Review
- Requirement Management Systems/Product Breakdown Structure and Change Management will help

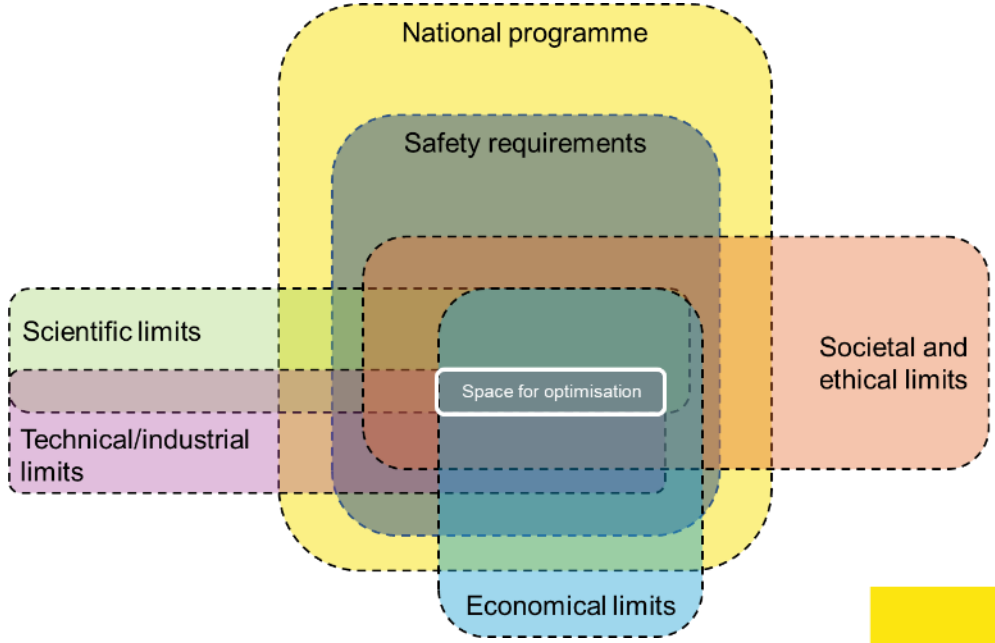
Limits?

- „prevailing circumstances“
- Long list of drivers for the optimization



WORKSHOP N°2 (TASK 3.1)

- A GDF project is always a highly complex project with the participation of not just a wide spectrum of scientific and engineering disciplines but also a wide spectrum of stakeholders
- Optimisation is always embedded in a pre-defined frame of **prevailing circumstances**. In detail, they will change in the different stages of a repository program
- Naturally, in such a complex system every actor has its own view and particularly own focus
- This is notably reflected in the understanding and expectations of the different stakeholders about GDF optimization



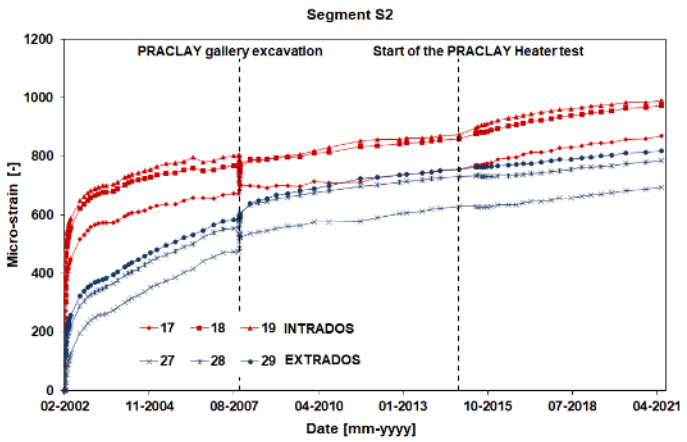
TASK 3 – SUBTASK 3.2 CASE STUDY

- To support the discussions in sub-task 3.1 one or more generic case studies has to be developed
- The case study serves as a basis for the development and illustration of the mutual understanding regarding optimization approaches in sub-task 3.1
- The case study represents a theoretical case of challenging optimisation of one or more repository SSCs (systems, structures and components) and procedures
- The case study is expected to capture several different optimisation objectives pursued by the different actors
- To do so, the task contributors will first build a consensus regarding the design bases of the case study and its expected level of detail and complexity

TASK 3 – SUBTASK 3.2 CASE STUDY

Case Study 1

- Optimization of segmental concrete lining for radioactive waste geological disposal in clay formations
- use data from URL HADES (Belgium)



Case Study 2

- Optimization of a closure system in a crystalline host rock
- Combine information and find common features:
  - Closure design
  - Methods used in the performance assessment of closure systems
  - Identified challenges and needs for closure optimisation
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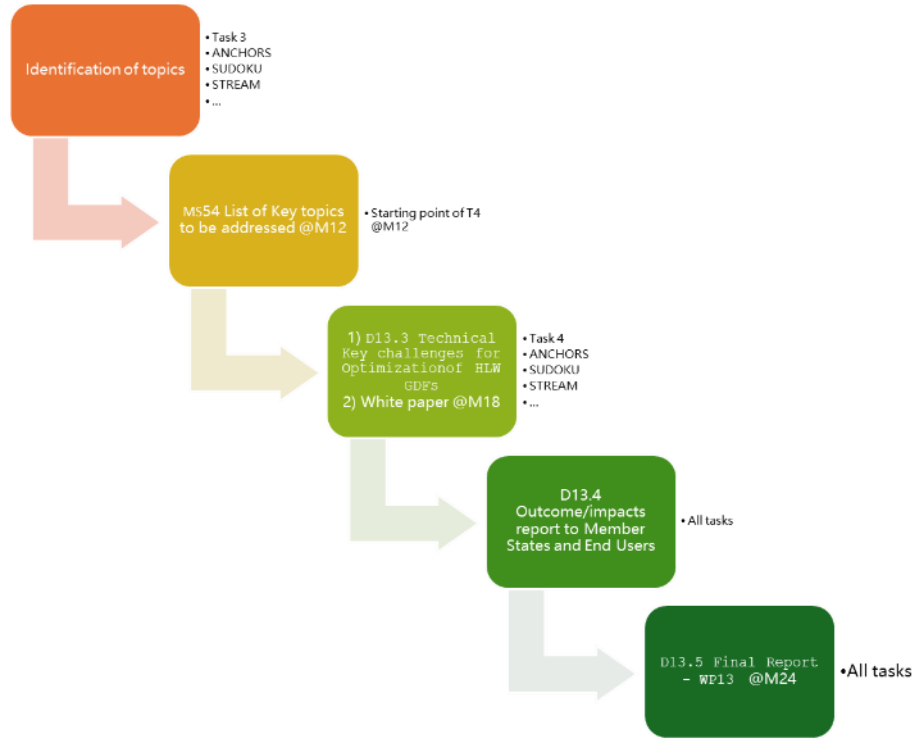
TASK 4

- Starting with year 2
- Task will provide overviews of the identified optimisation topics and possible optimisation approaches, considering the views of the REs, WMOs, TSOs and CSOs. The task will identify potential needs for further activities
- **Key topics/SSCs will be identified and future research topics will be named**
- Key topics/SSCs already identified during the WP preparation are Buffer, Backfill, Lining and Closure including Plugs/Seals, in different host rock domains, e.g.:
  - Optimization of buffer and backfilling composition and installation methods
  - Optimization of closure process, (gallery) sealing design, location and installation methods
  - Design of gallery support structures and flexibility in changed geo-mechanical conditions, especially in claystone

T4 PROCESS

- Identification of key topics includes the exchange with linked WPs
- The related white paper will be published by moth 18
- Discussions about a second wave proposal in parallel to the identification of key topics
- Work in progress…



Workflow identification of key topics

DELIVERABLES

Number	Deliverable name	Short description	Type	Dissemination level	Delivery date (in months)
1	Draft: Existing actor views	Report summarizing the understanding in participating countries, colleges and participating civil society plus general literature about optimisation of GDF, input from first workshop (milestone 1)	R Draft (Green) Paper	SEN WP internal	6 completed
	Final: Mutual Understanding of actors views about optimisation	Based on milestone 2, finalise deliverable 1 by documenting the mutual understanding/consensus view about the goals, strategies, and key challenges within optimization.	R Final (Green) Paper	PU	**14** In progress
2	Technical Key challenges for Optimization of HLW GDFs	Documents potential for further actions for specific key optimisation challenges, based on milestone 2 and 3	R (White) paper	PU	18
3	Outcome/impacts report to Member States and End Users	Summarize the papers and the work in task 3 and 4, including case study as test field, conclude what new position was formulated	R Technical Report	PU	20
4	Final Report	Summarize the papers and the work in task 3 and 4, including case study as test field, conclude what new position was formulated, Summarize End user Feedback	R Final Report	PU	24

THANK YOU FOR YOUR ATTENTION!