PLEIADES
Smarter Plant Decommissioning

KONTEC 2023
Dresden, 30.08.2023

Connecting
digital tools for smarter
nuclear decommissioning and dismantling

#25. PLEIADES-Projekt: Verwendung digitaler Modelle | *PLEIADES project: the use of digital models*

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Overview

14 partners from 7 countries
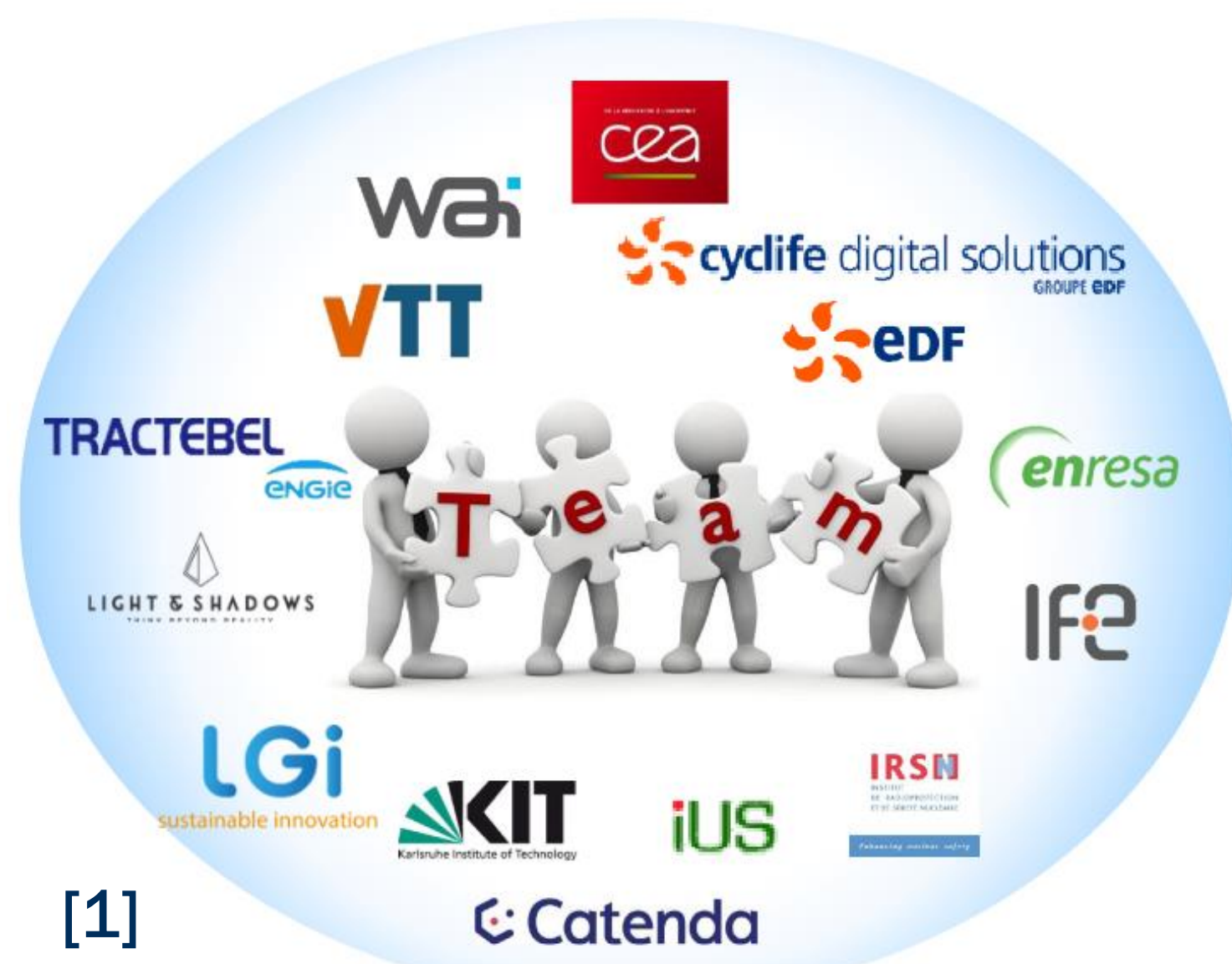
[1]

3 case studies from 3 countries

HRR (NO)
SMG (ES)
BCOT (FR)

[2]

7 Work Packages (WP) in 38 months

WP1: Requirement analysis, specification and test design

WP2: PLEIADES platform development

WP3: Implementation of PLEIADES platform on real use cases

WP4: Modelling and results evaluation

WP5: Standardisation efforts, exploitation and training

WP6: Dissemination, communication & stakeholder engagement

WP7: Project coordination and management

The PLEIADES concept

Each D&D process is handled differently, which may result in lost time and higher costs in order to avoid major problems. Therefore, especially at a European level, standardisation will allow better coordination and transfer of experience and knowledge between countries, resulting in sharing best practices and adapting the process on each site specificities.

PLEIADES (**PL**atform based on **E**merging and **I**nteroperable **A**pplications for enhanced **D**ecommissioning process**ES**) is a European project where representatives of industry, research, safety organization and technological SMEs join forces to demonstrate a modular software ecosystem based on interconnection of front-line support tools through a decommissioning specific ontology using the BIM (Building Information Modelling) methodology. The ontology is the basis of PLEIADES and provides a common understanding of the concept with specific decommissioning terminology. The developed platform provides the integration of the different data and tools.

Santa María de Garoña (SMG)
Halden Research Reactor (HRR)
Basse Chaude O. du Tricastin (BCOT)

[3]
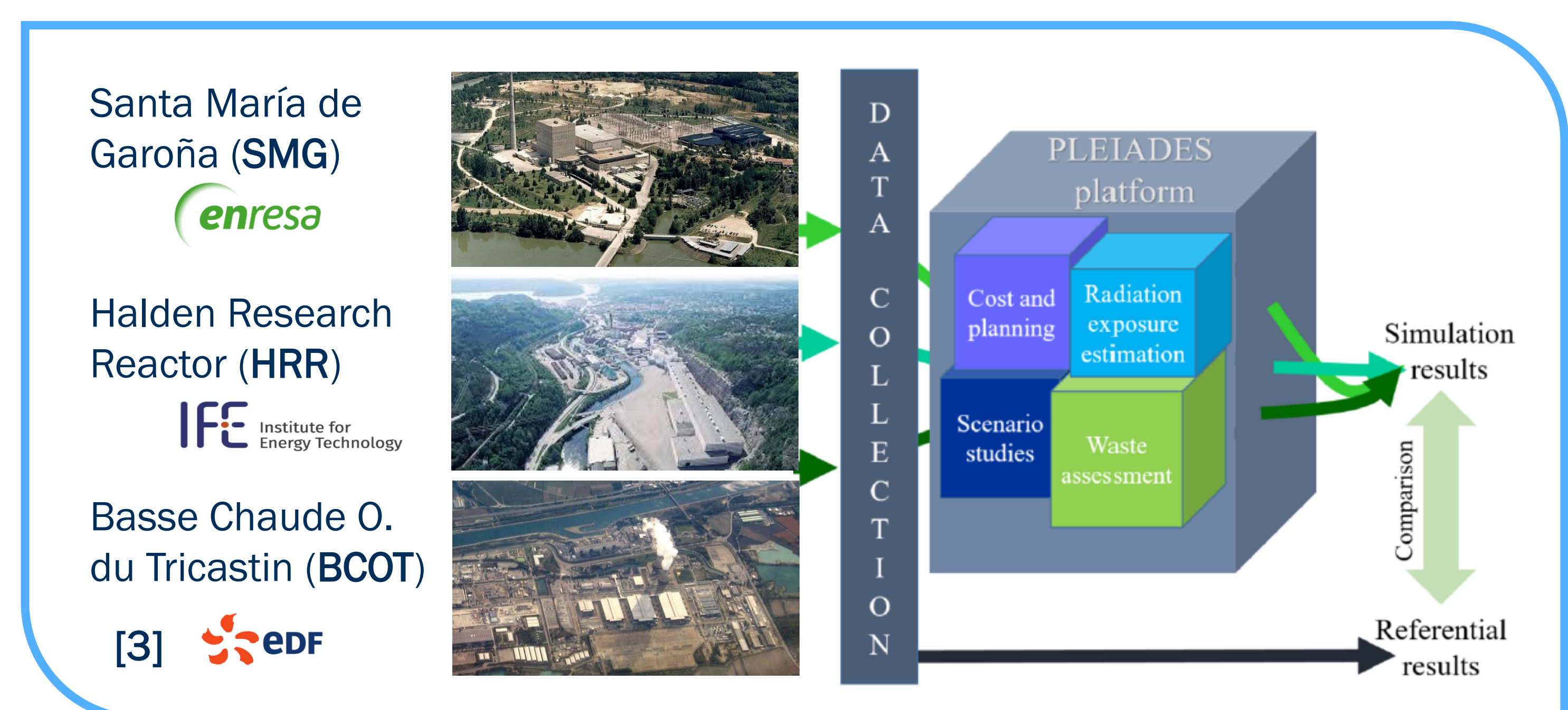
User Stories (US)

US #1: Manual vs. remote radiological characterization

US #2: 3D supported vs. digitally enhanced dismantling

US #3: Manual vs. automated decontamination of building surfaces

US #4: Strategic risk management planning

US #5: Regulatory/TSO review capabilities

US #6: Strategic waste management planning

In order to demonstrate the PLEIADES concept, 3 use cases are used in different European countries: France, Norway and Spain. 6 user stories have been defined on these use cases, addressing application areas such as cost and planning, radiation exposure estimation, scenario studies and waste assessment.

3 user stories (each one linked to one use case) focus on comparison of alternative scenarios to decommissioning activities such as radiological characterization, dismantling and decontamination of building surfaces. The 3 others depend on 3D models developed for the previous ones and focus on risk management, uncertainties, regulatory aspects and waste management strategies.

In order to success in the tests and validation, the following steps are mandatory: data collection and integration, data security assurance and data completeness verification. This has already started in the ongoing implementation of PLEIADES platform on real use cases: most relevant data has been collected, the completeness of the models started to be checked and the BIM models are being developed. These steps are not linear, but the whole process is iterative.

WP3: Implementation on real use cases
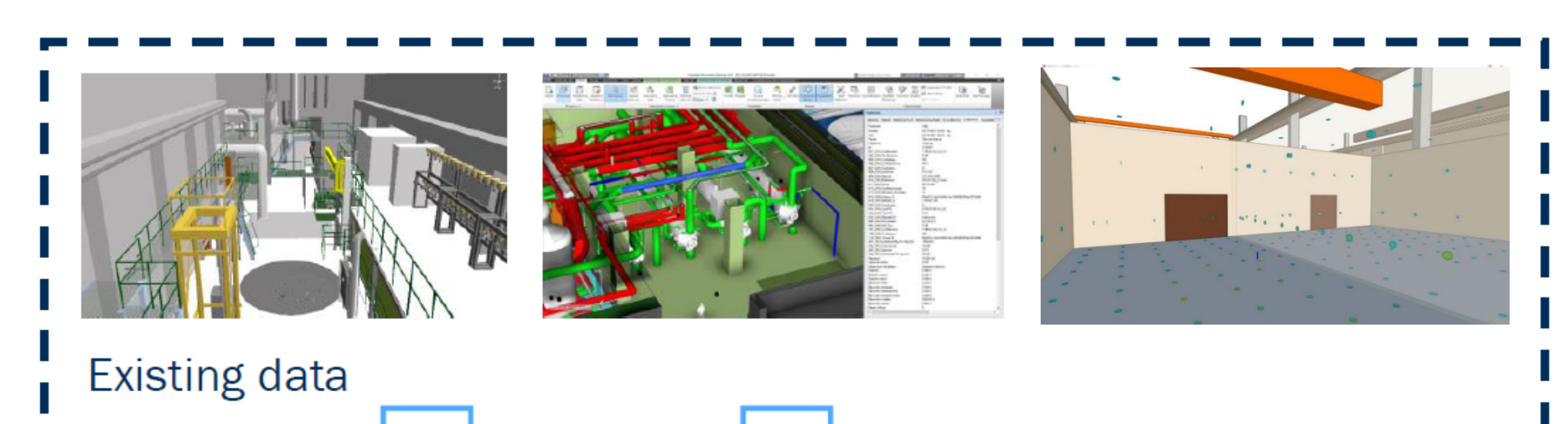
T3.1: Checking and validation on input data completeness

T3.2: Development of 3D models

T3.3: Development of BIM model
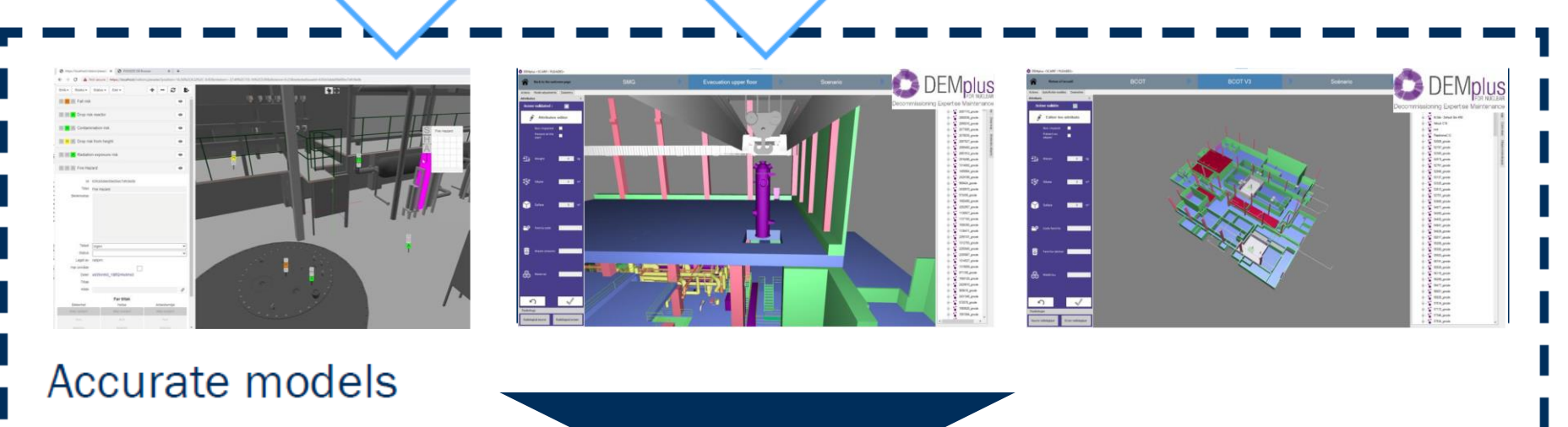
Input
- Physical inventory, features
- Radiological inventory

Activities
- Analyze inputs
- Identify gaps and problems
- Propose and perform activities to complete the models

Output

Existing data
Collection
Improvement
Iterative Process
Accurate models

[4] [5]

T3.4: Testing and validation of scenarios feasibility

T3.5: Waste estimation

T3.6: Radiation exposure estimation and safety assessment

T3.7: Cost and duration estimation

Sources

[1] [3] M.-B. Jacques (2021). PLEIADES, the Smarter Plant Decommissioning. DEM 2021 – International Conference on Decommissioning Challenges (France, Avignon)
[2] www.pleiades-platform.eu
[4] Workflow in the WP3
[5] I. Szoke, J.-L. Flouttard (2023). PLatform based on Emerging and Interoperable Applications for enhanced Decommissioning processES.
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15-19 May 2023, Vienna, Austria

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