

INPP Decommissioning Key Projects and Issues



1 INPP decommissioning: background information

2 Progress in decontamination and dismantling projects

3 Further D&D projects and issues



1 INPP decommissioning: background information



Design: Unique, 2 × RBMK-1500 water-cooled, graphite-moderated channel-type power reactors. Designed and staffed for fully autonomous operation.



Capacity: Intended to supply NW region of former USSR (not Lithuania). After independence, one unit could produce 80% of Lithuanian electricity needs.



Operation:

Unit 1 commissioned Dec 1983 / closed Dec 2004

Unit 2 commissioned Aug 1987 / closed Dec 2009



Early closure: Required to facilitate EU accession. **First decommissioning of RBMK-type NPP**



1 INPP decommissioning: background information



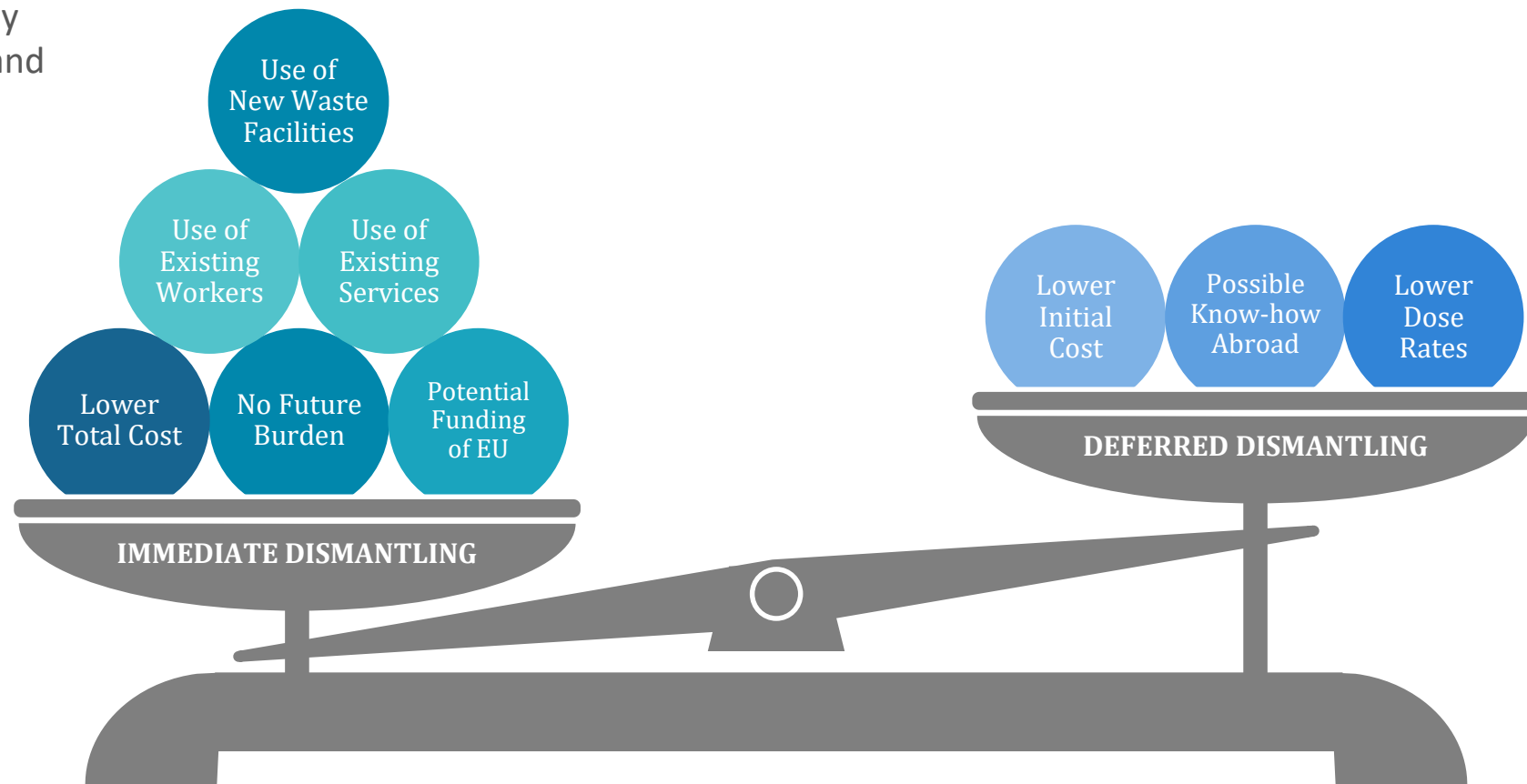
Strategy

- Immediate Dismantling selected by Government for technical, social and financial reasons

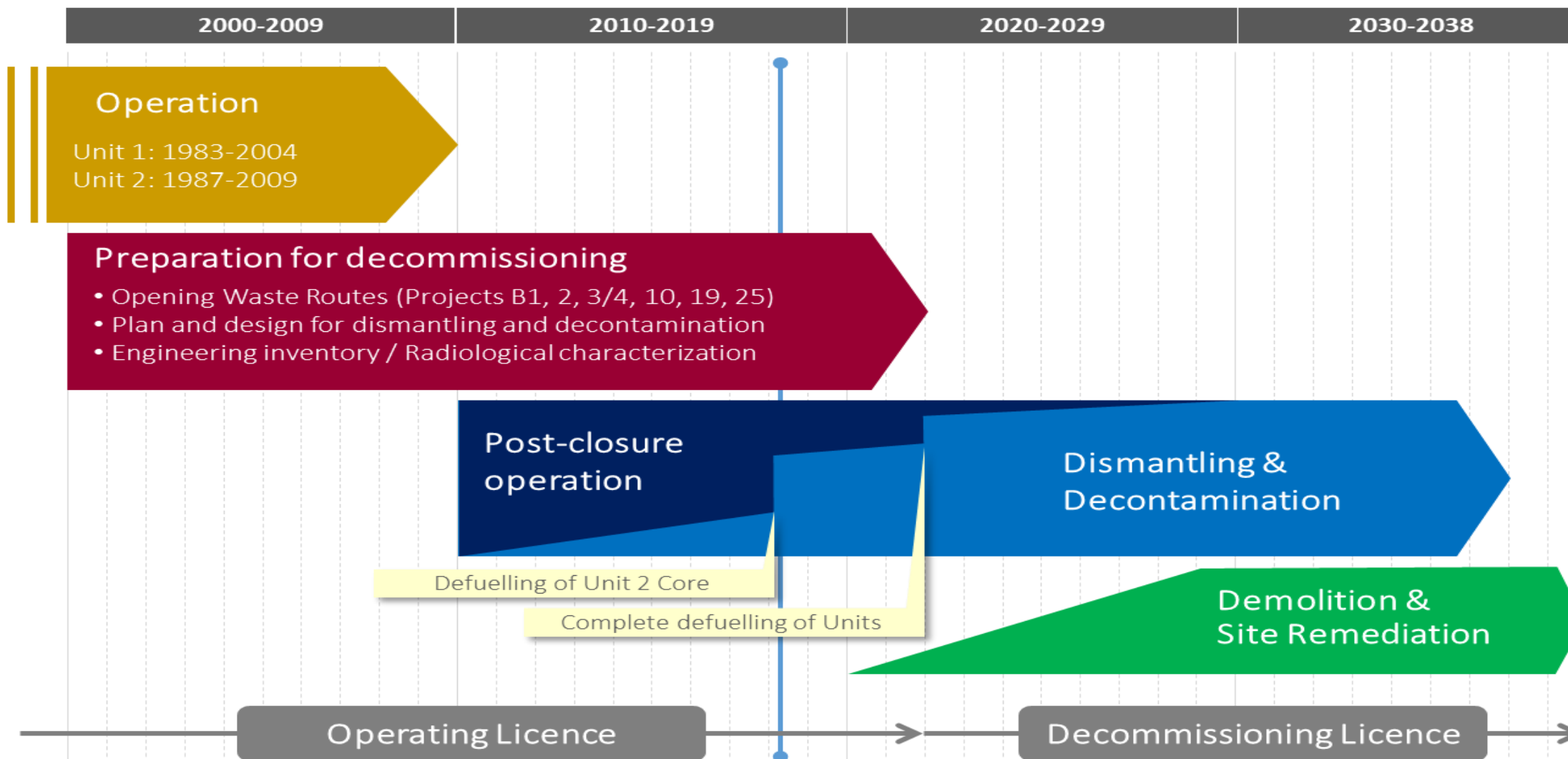


Final decommissioning plan

- Technical measures for dismantling, radioactive waste management and disposal with financial estimate.
- First issue approved in 2005, last issue approved in 2015, next updated issue expected approval in 2019-2020



1 INPP decommissioning: background information



1 INPP decommissioning: background information



All new waste interim-storage or disposal facilities to be created on, adjacent to, Ignalina NPP site (radius ≈ 1.5 km)



- Simplifies permissions
- Reduces new infrastructure
- Reduces transport
- Facilitates physical protection



2 Progress in decontamination and dismantling projects

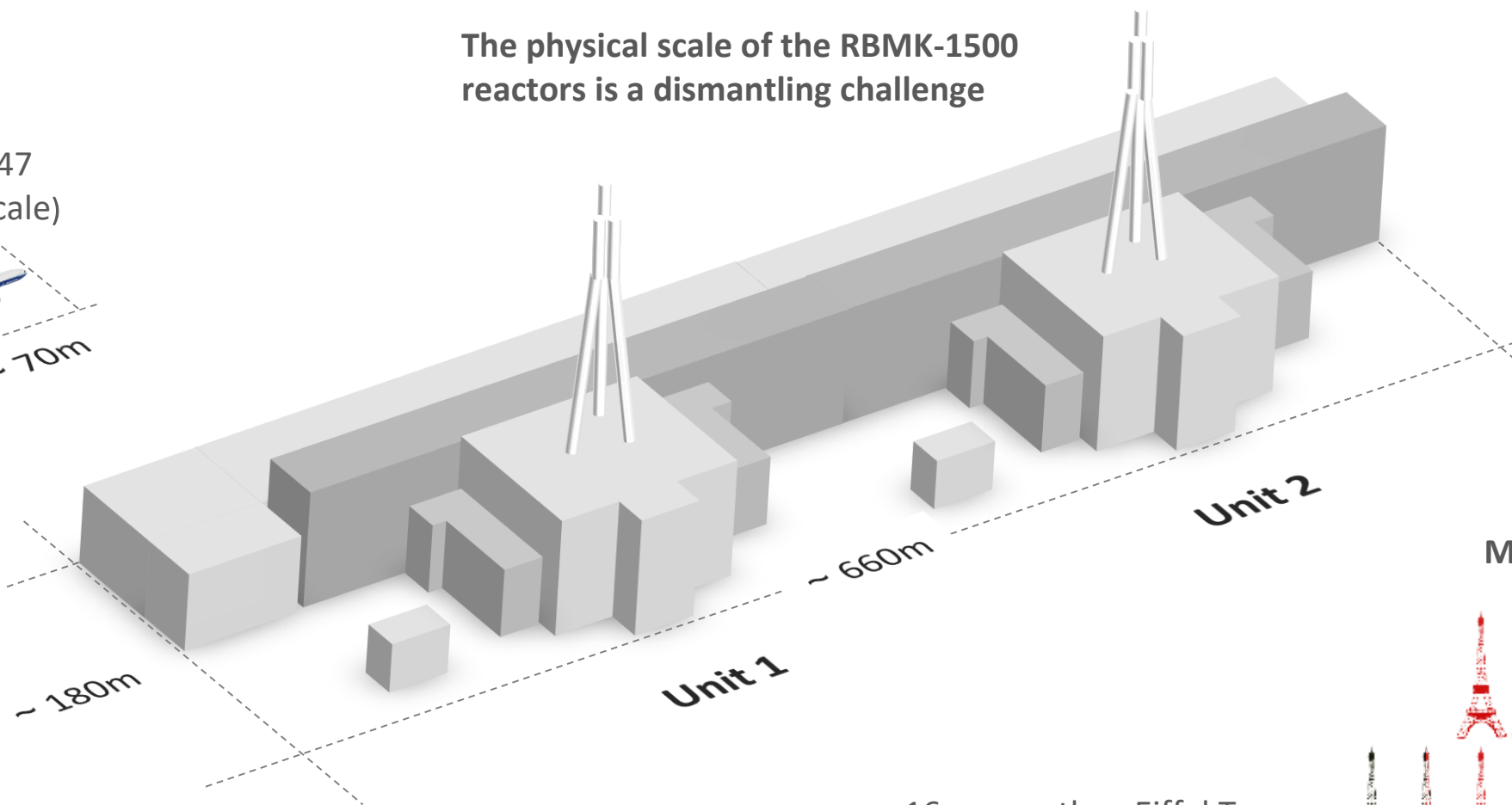
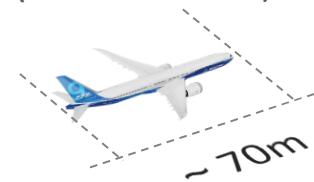


Progress in decontamination and dismantling projects



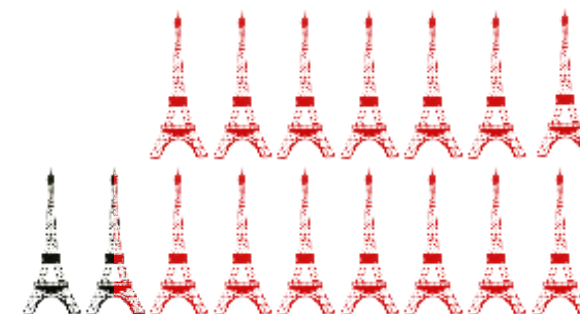
The physical scale of the RBMK-1500 reactors is a dismantling challenge

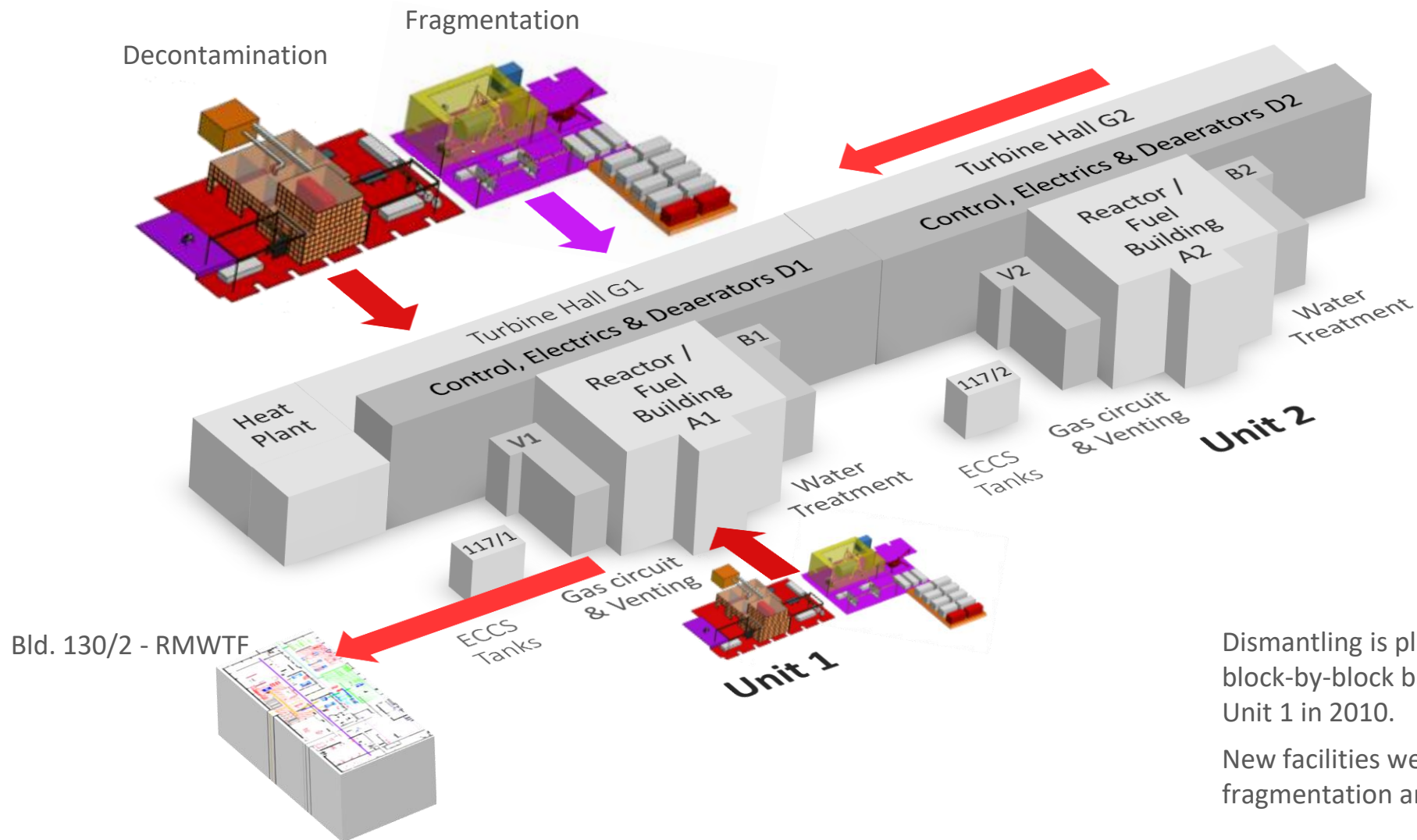
Boeing 747
(to same scale)



Metal to dismantle

16× more than Eiffel Tower
(of which 14½ contaminated)





Dismantling is planned and executed on a block-by-block basis. Dismantling started in Unit 1 in 2010.

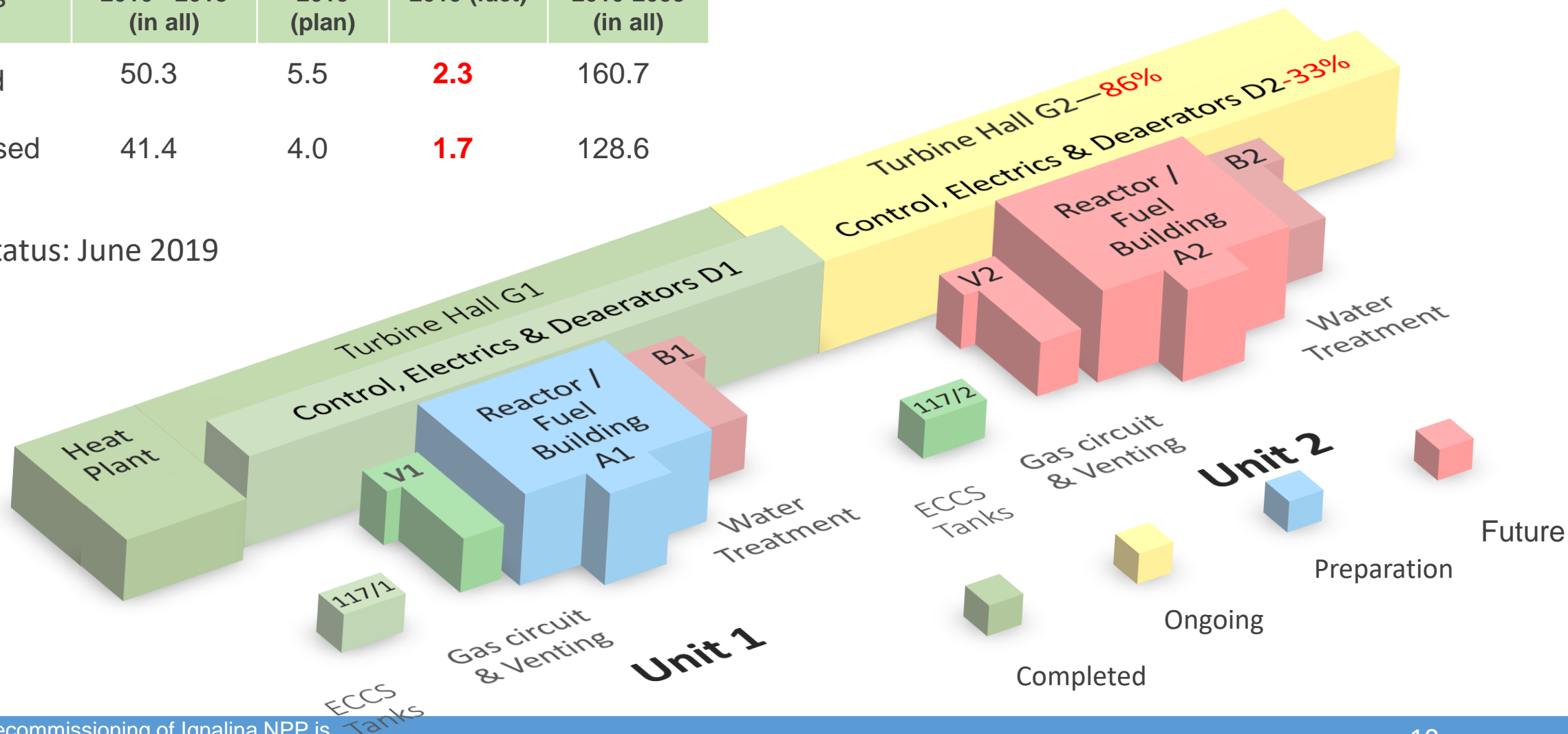
New facilities were required for fragmentation and decontamination

3 Progress in decontamination and dismantling projects



X1000 tons	2010 - 2018 (in all)	2019 (plan)	2019 (fact)	2010-2038 (in all)
Dismantled	50.3	5.5	2.3	160.7
Free-released	41.4	4.0	1.7	128.6

Current status: June 2019



2 Progress in decontamination and dismantling projects



D&D in Turbine Hall (building G1)

Equipment size reduction and decontamination workshops

Project progress:

- **Project start** – November 2007
- **Project finish** – June 2019
- **Total dismantled** till as at 30th June 2019 – 18 935 tons



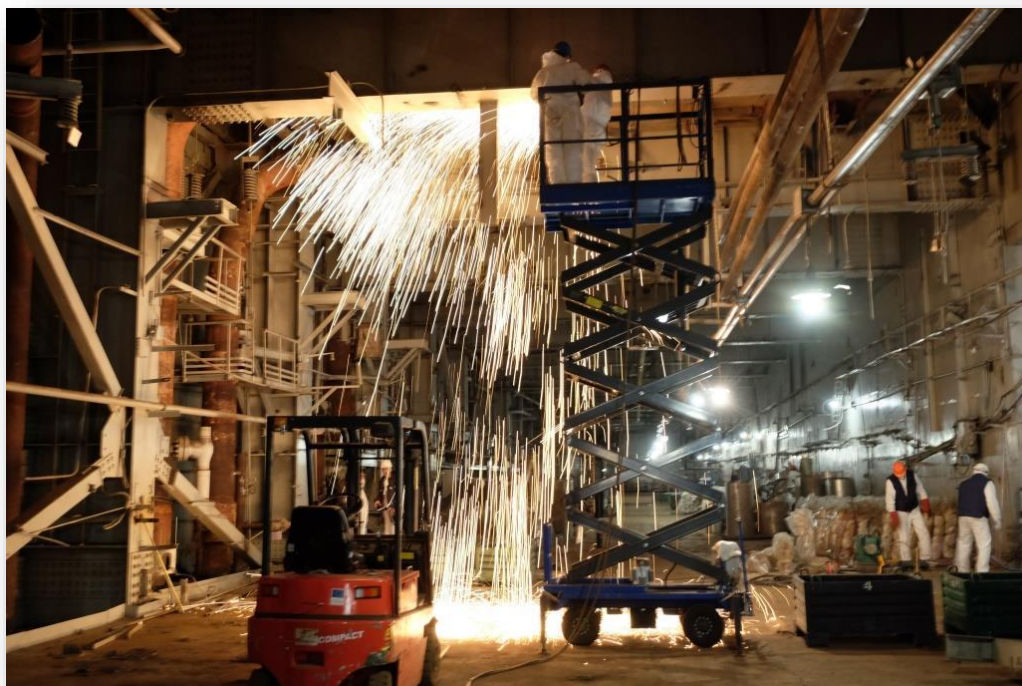
2 Progress in decontamination and dismantling projects



D&D in Control, Electrics & Deaerators building (D1)

Project progress:

- **Project start** – February 2010
- **Project finish** – June 2019
- **Total dismantled** as at 30st June 2019 – 4 656 tons



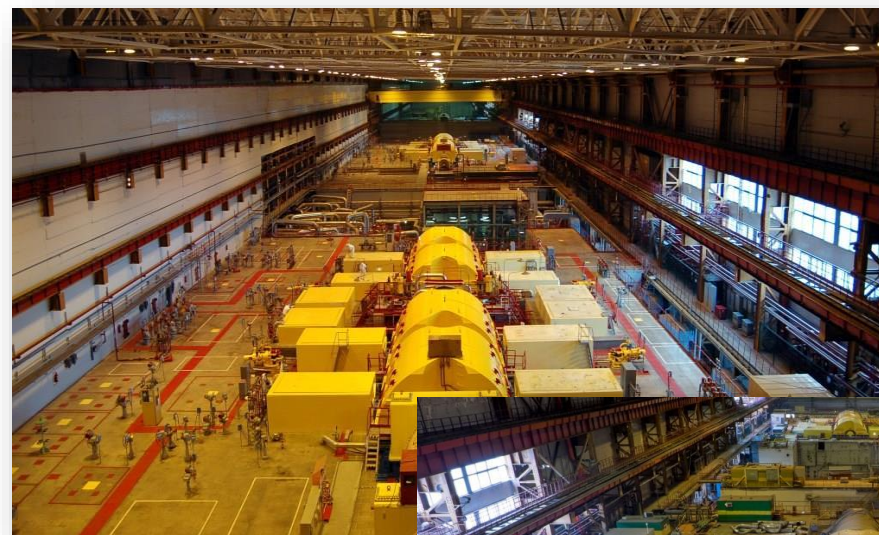
2 Progress in decontamination and dismantling projects



D&D in Turbine Hall (building G2)

Project progress:

- Project start – July 2011
- Project finish – June 2021
- **Total to be dismantled** –18.925 tons
- **Total dismantled** as at 30th June 2019 – 16 363 tons



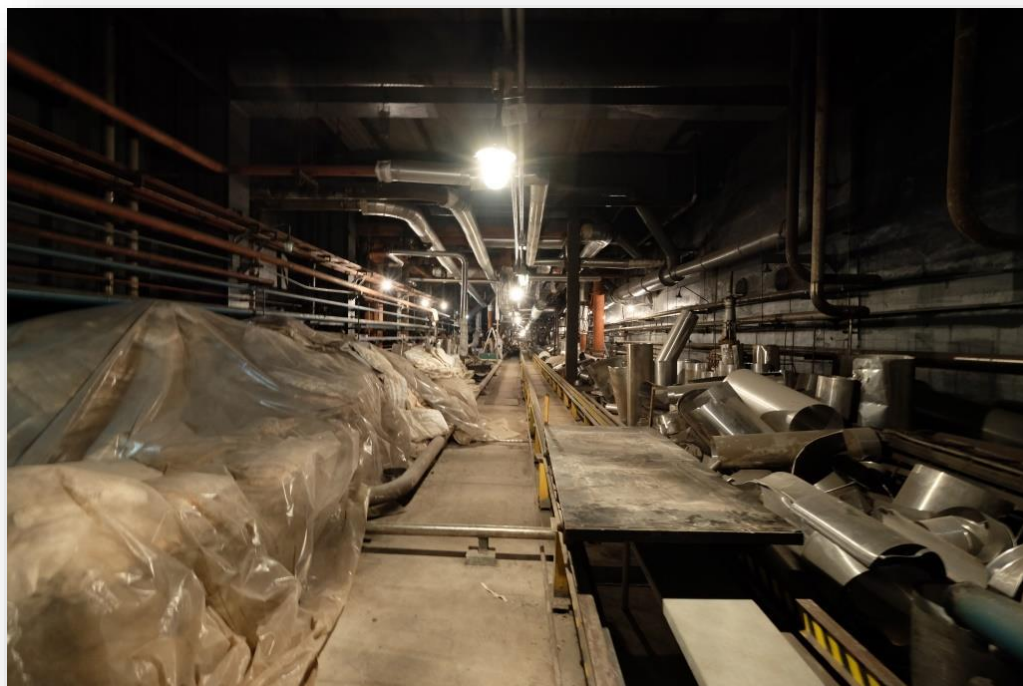
2 Progress in decontamination and dismantling projects



D&D in Control, Electrics & Deaerators building (D2)

Project progress:

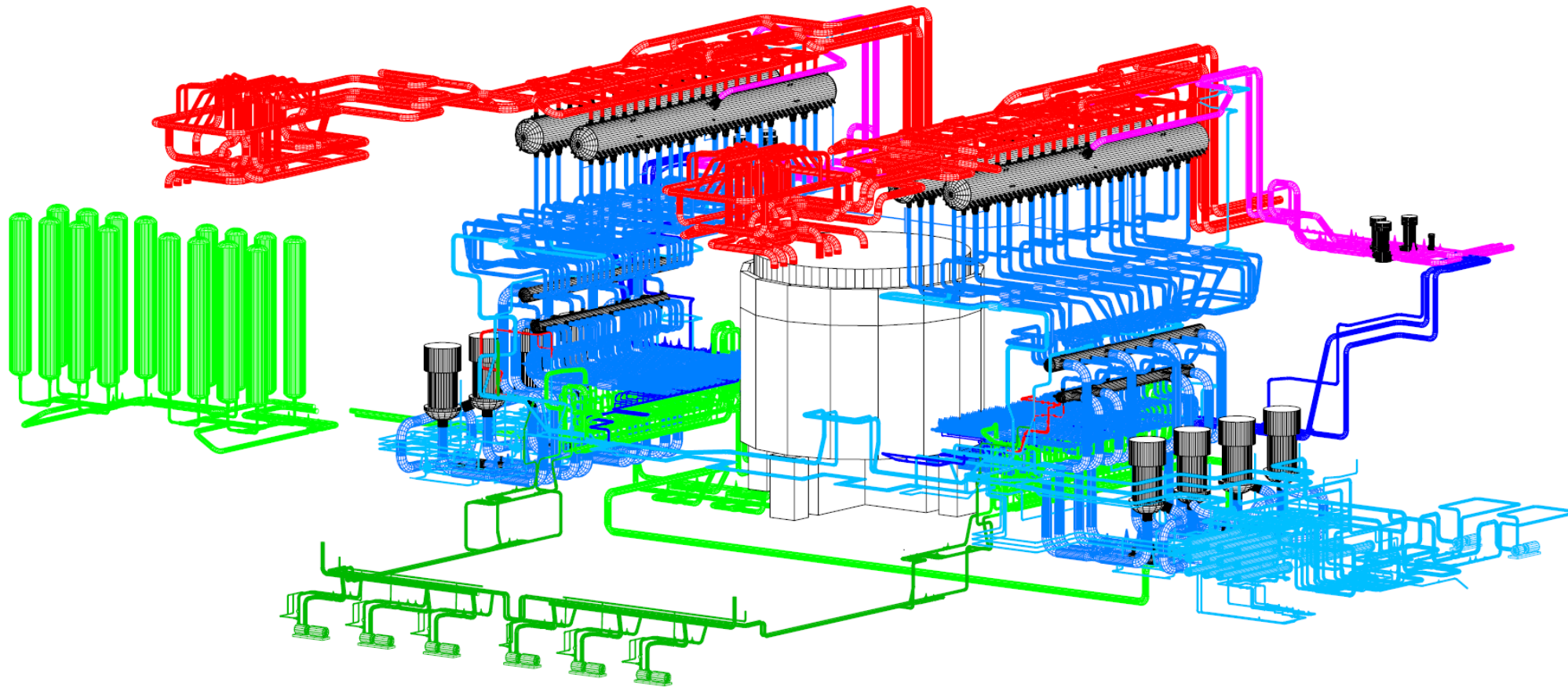
- **Project start** – July 2011
- **Project finish** – December 2023
- **Total to be dismantled** –3.845 tons
- **Total dismantled** as at 30th June 2019 – 1 294 tons



3 Further D&D projects and issues



New projects: Unit A1 and R1 and R2 zones D&D



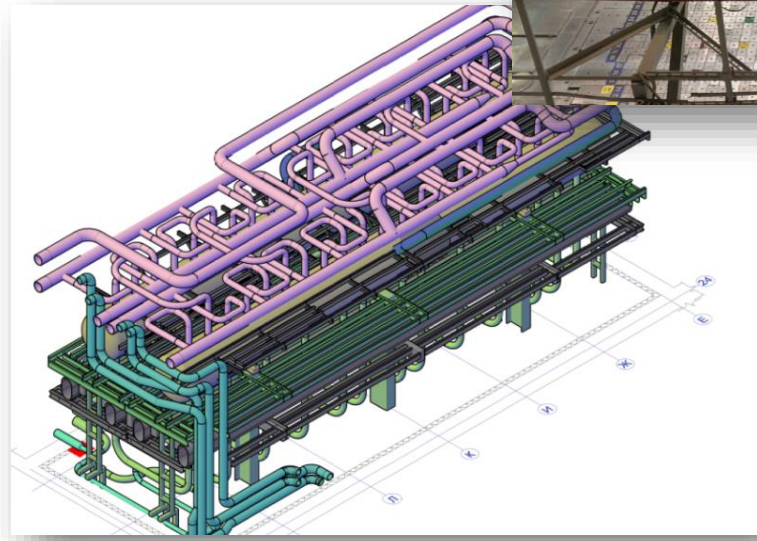
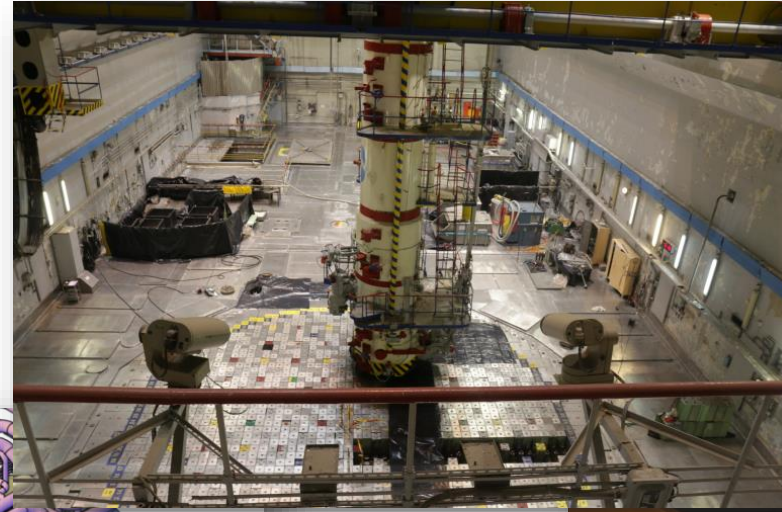
3 Further D&D projects and issues



Unit A1 D&D (2203 project)

Project progress:

- **D&D TD and SAR Issue 02** - preparation of responses on VATESI and TSO experts comments is ongoing.
- **Pre-treatment Workshop (project APW.01)** – preparation is ongoing
- **Unit 1 Refuelling Machine D&D** - D&D started in July 2019
- **Main D&D activities – February 2020**



3 Further D&D projects and issues



R1 and R2 zones (2101 project)

Project progress:

- **D&D TD and SAR Issue 02** - preparation of responses on VATESI comments is ongoing. .
- **GDS** was approved by RPC, VATESI, and MoE in **September 2018**
- **“Hot” trials** of technology and equipment for graphite treatment (rings and sleeves) are under preparation
- **Start of D&D – November 2019**



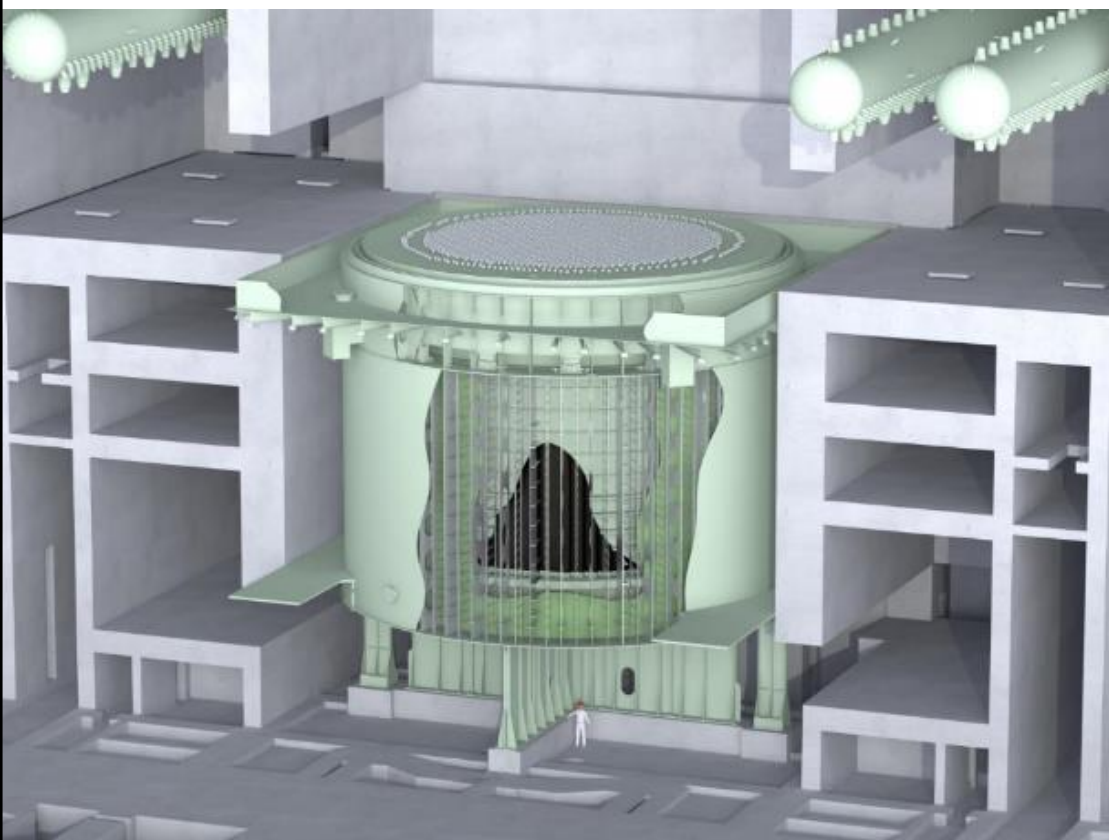
Cold tests of Graphite Crushing Device



3 Further D&D projects and issues



New project: Reactor dismantling and long lived waste (including graphite) storage



3 Further D&D projects and issues



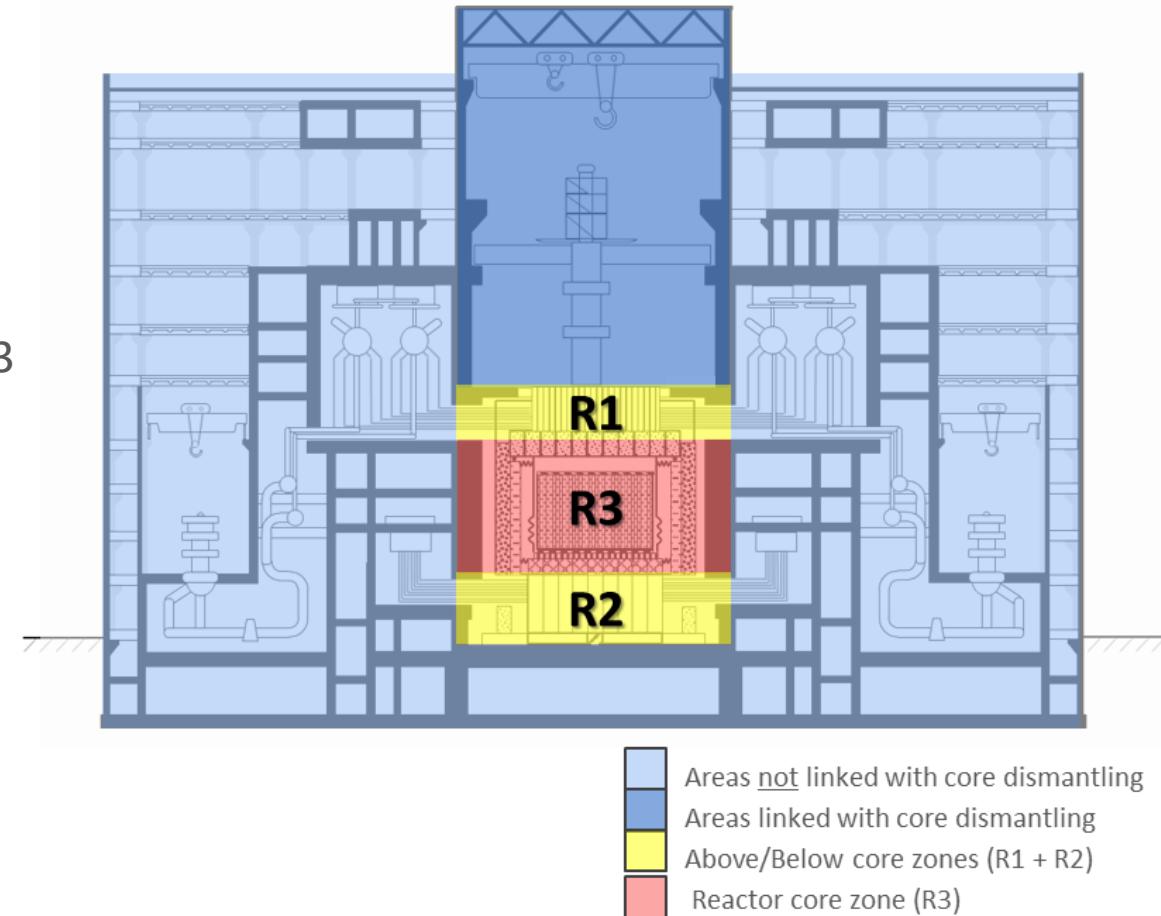
R3 reactor core dismantling is the key project for INPP decommissioning critical path

Name of Project:

RBMK-1500 reactor cores dismantling in Zone R3 and RWISF (UP01/R3)

Project objective:

- To develop the dismantling technologies for structures and equipment from INPP Units 1 and 2 reactor shafts (in the R3 area)
- To develop the technologies for radioactive waste management generated as a result of both units graphite stacks dismantling
- To dismantle the reactor structures and equipment from INPP Units 1 and 2 reactor shaft applying the developed technologies

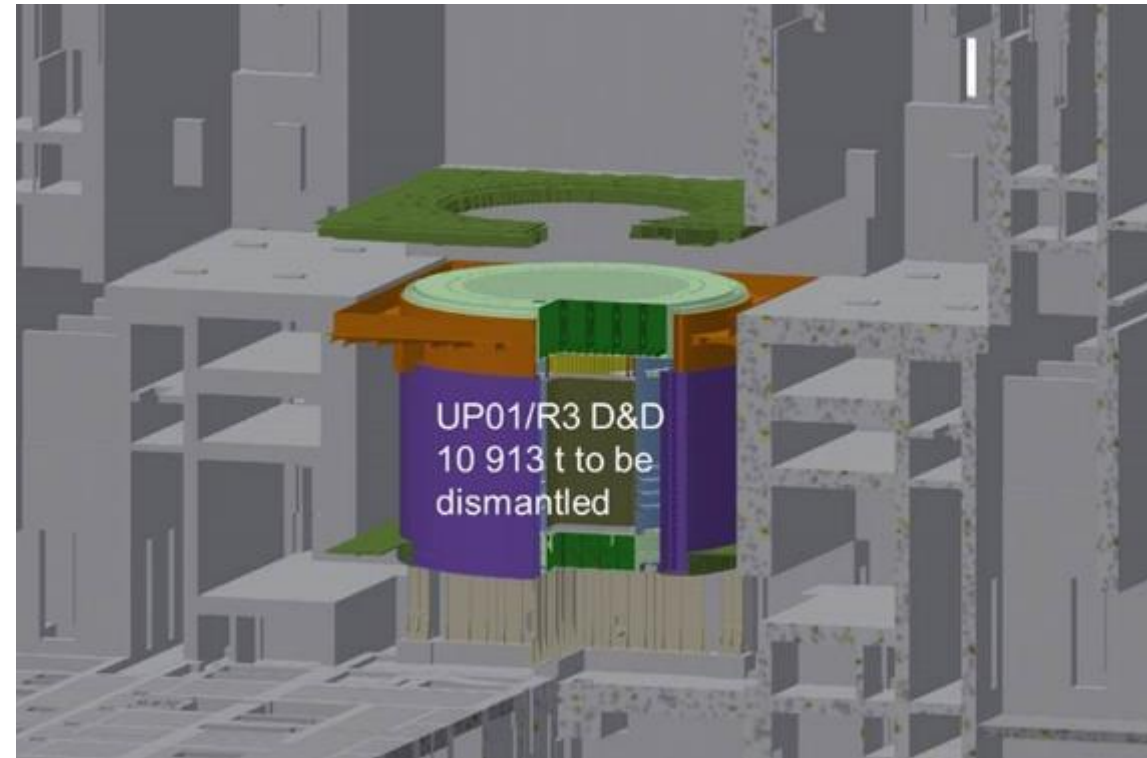
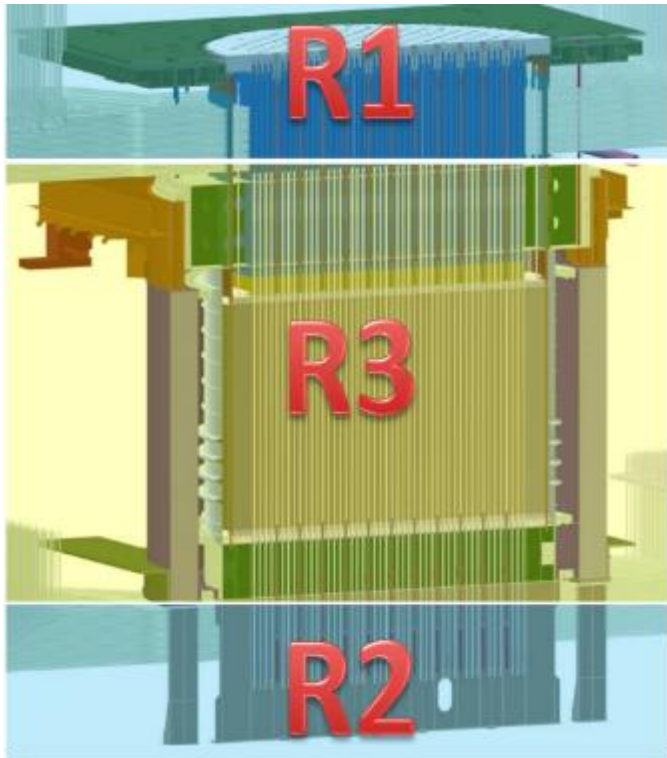


4 Further D&D projects and issues



R3 reactor core dismantling challenges:

- **R3 reactor** core dismantling is the key project for INPP decommissioning **critical path**
- **10 028 t** of Unit A equipment (drum-separators, pumps, pipelines...) to be dismantled and treated before R3 D&D
- **2 053 t** of reactor R1 and R2 zones (upper and bottom parts of reactor) to be dismantled and treated before R3 D&D



3 Further D&D projects and issues



In preparation for the reactor core dismantling work, the following activities shall be undertaken:

- investigation of reactor structures;
- sampling of irradiated reactor graphite and other materials;
- testing of remote drilling, cutting and milling processes to be used on some structural elements;
- testing of technologies for in-core operations.



Investigation



Sampling



Equipment
testing



Technologies
acceptability



3 Further D&D projects and issues



Preparation for INPP reactor core (R3 zone) D&D:

As a part of R3 tender preparation the information, ideas, exchange of experiences with regard to Reactor Dismantling and Waste Routes Optioneering, Concept Design and Environmental Assessment Report Development were collected:

- The set of the meeting/workshop “Experience of Reactors Dismantling” was held (18th and 25th October , 8th and 15th November 2018).
- 49 companies and stakeholders (EC, EBRD, MoE of RL, CPMA, VATESI) have taken part in the workshops

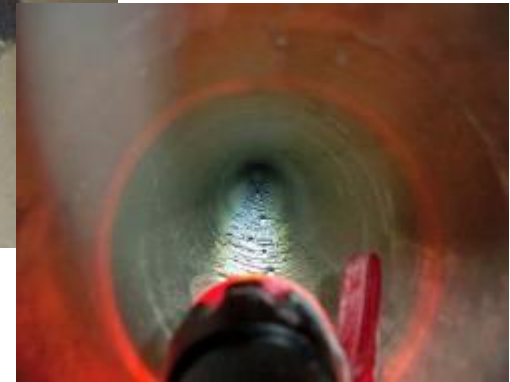


3 Further D&D projects and issues



Sampling of irradiated reactor graphite and other materials:

- **Collection of input data** (including sampling) and reparation of TS are in progress
- Taking off **graphite samples** and **activated materials** from Unit 2 R3 was completed in June 2019

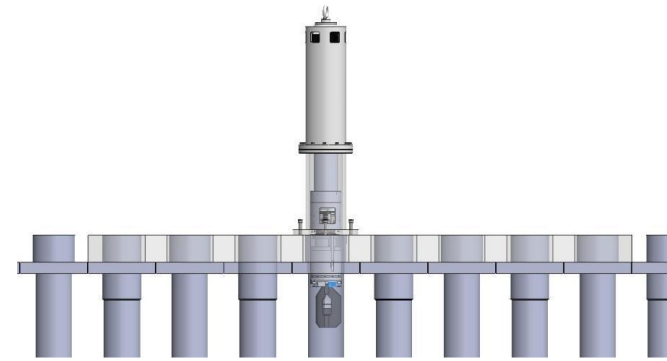
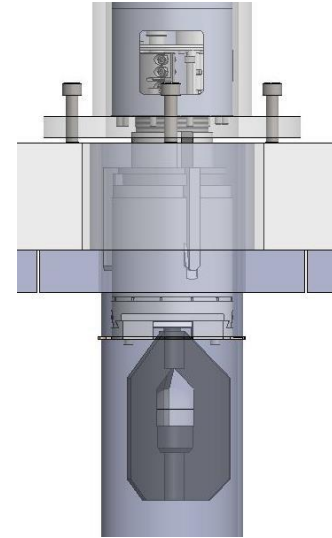


3 Further D&D projects and issues



Technologies and equipment testing at Ignalina NPP site

- Structural analysis (expertise) of upper reactor structure “E” for direct access
- Procurement and testing of semi-remote tubes, walls and floors cutting equipment (under gamma-exposure up to 800 mSv/h)
- Testing of technologies and equipment for reactor structure “E” cutting are ongoing

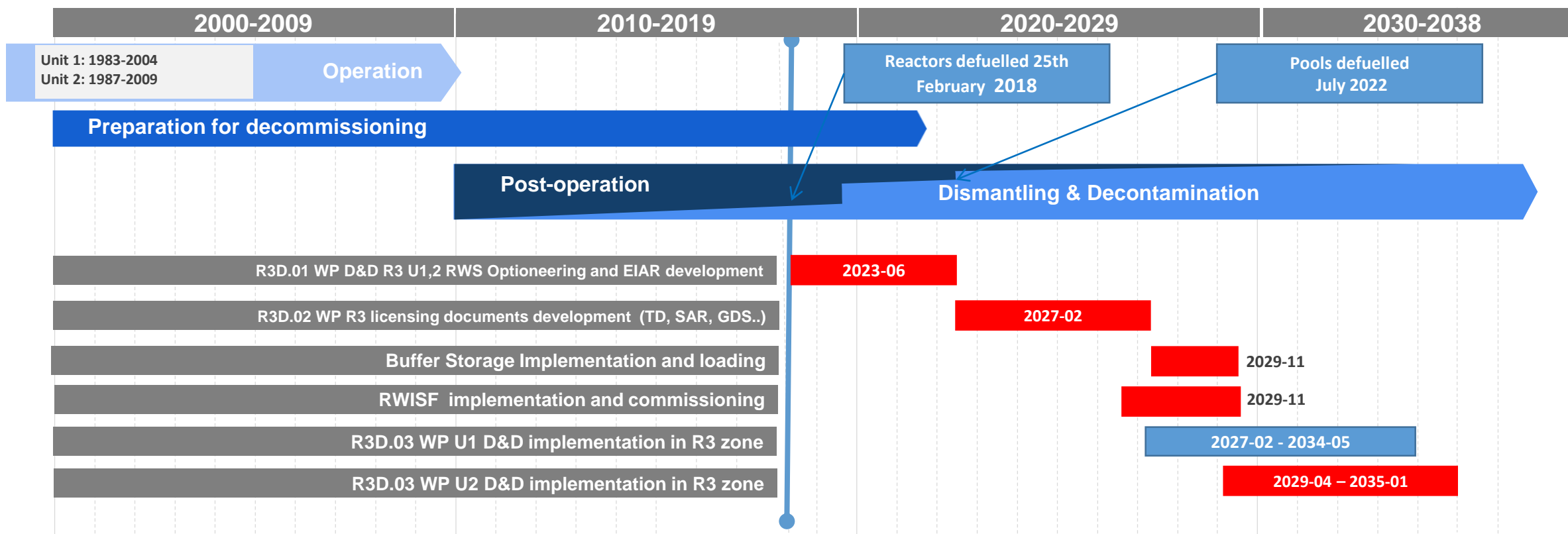


3 Further D&D projects and issues



Next main steps:

- **Project Identification Fiche** final EC agreement by **August 2019**
- **Technical Specification** final INPP / CPMA agreement - **2019/Q4**
- **R3D.01 Tender** announcement up to end of **2019**



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Thank you for attention!



Decommissioning of Ignalina NPP is
co-financed by the European Union