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DTT Project overview

DTT info-day on TF magnets

Aula B. Brunelli, C.R. ENEA Frascati (Rome), Italy – 08/10/2019

Presenter Aldo Pizzuto on behalf of the DTT team

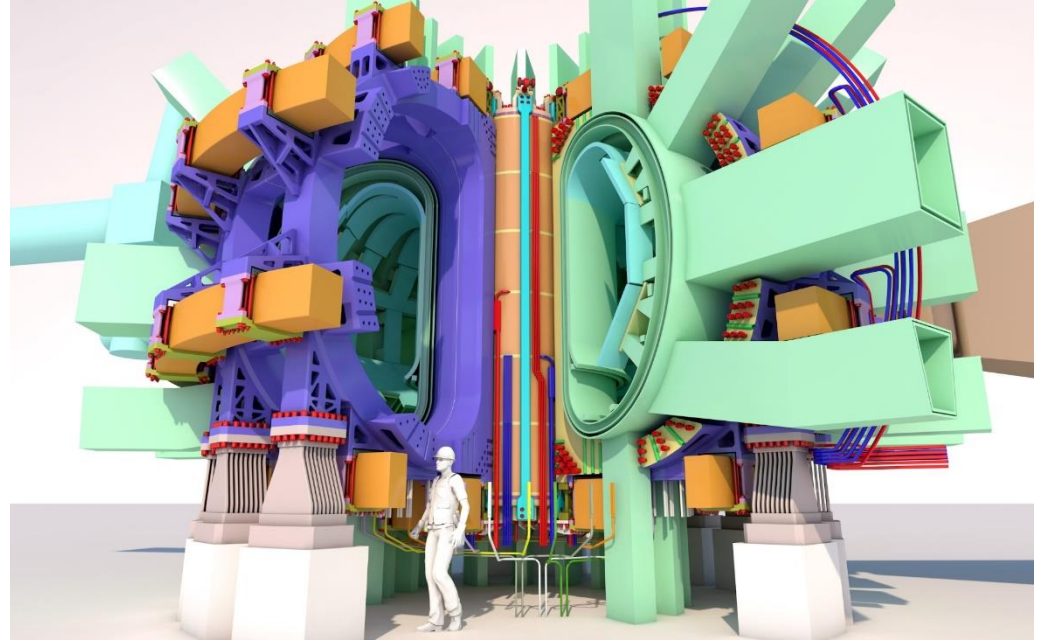


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DTT: Divertor Tokamak Test Facility project

General objective: DTT facility is addressed to the solution of the **power exhaust issues** in view of **DEMO** in the frame of **Eurofusion Road Map mission 2**.



DTT general view



Interim Design Report

April 2019

Ed. by R. Martone (CREATE), R. Albanese (CREATE), F. Crisanti (ENEA), P. Martin (RFX) and A. Pizzuto (ENEA)

Download:

<https://www.dtt-project.enea.it/index.php/documentation>



DTT Project Overview - Aulo B. Brunelli (ENEA) - Frascati - 08/10/19



Outline

- DTT project rational
- Project information
- Intermediate Milestones to be accomplished
- Components on critical path
- Main components and phases schedule
- Concluding remark

DTT rational

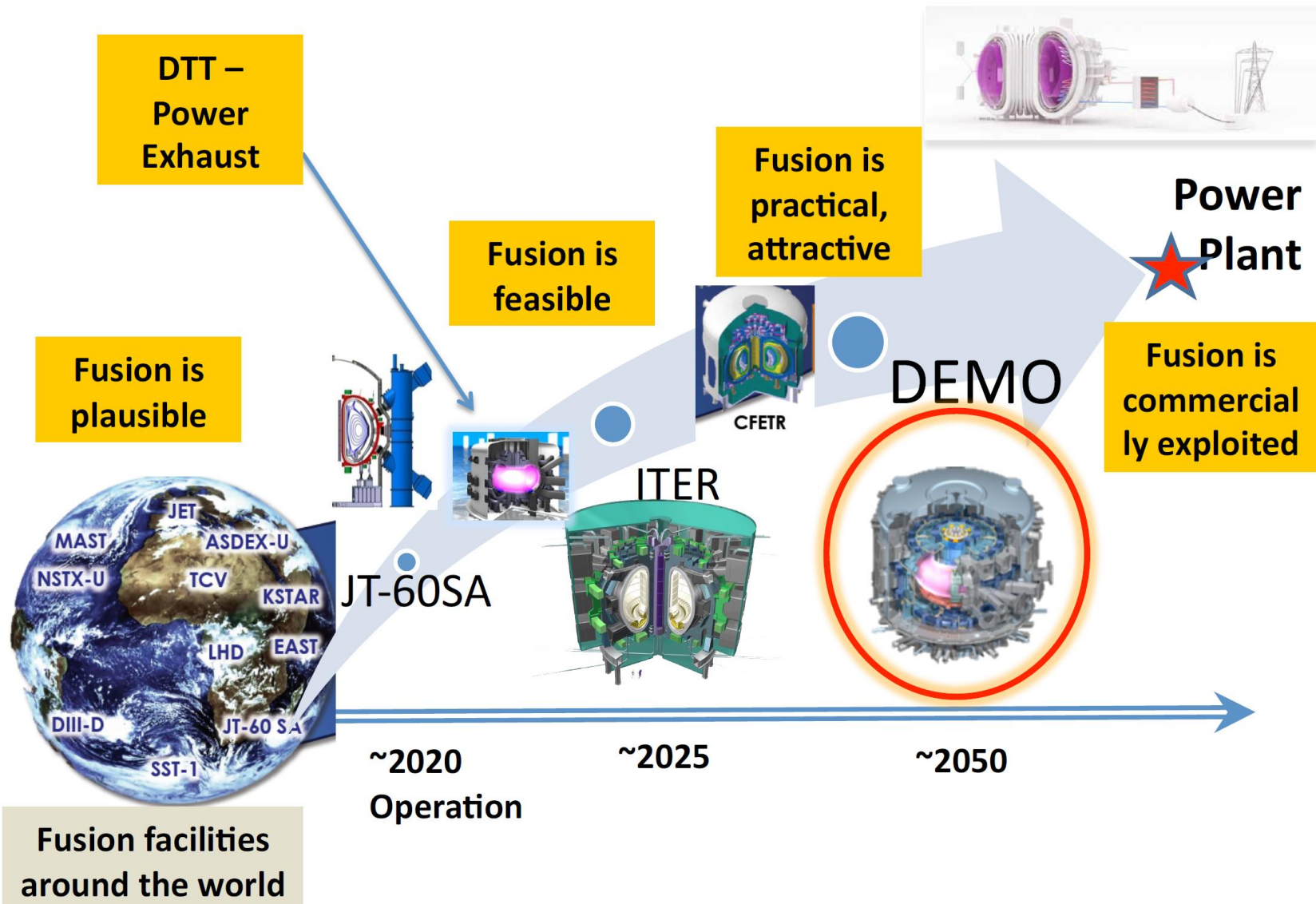
DTT is a new device, where the modern technologies can be adopted and further developed; the presently operating Tokamaks were designed about 40 years ago

From 2026 onwards DTT will represent the most powerful infrastructure to perform plasma experiments dedicated to the most important issue in view of DEMO

DTT construction will keep industry linked to fusion field

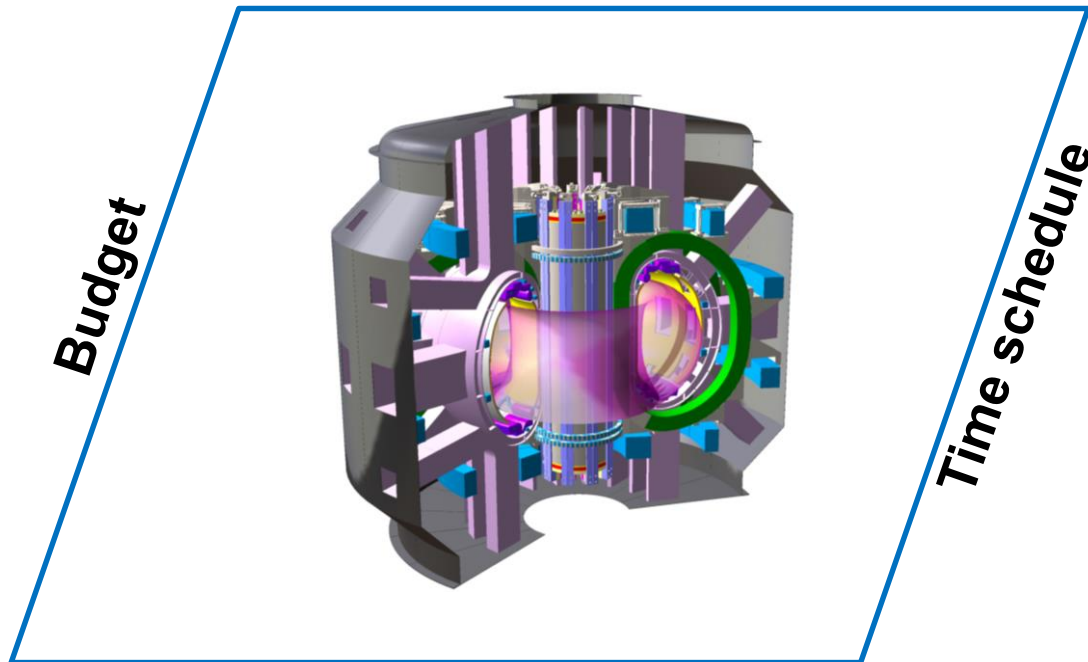
DTT would be the ideal training device to grow the new generations needed for feeding ITER and, subsequently DEMO, with skilled people

DTT fills a gap in the European Road Map



DTT design boundary conditions

Parameters relevant for ITER/DEMO

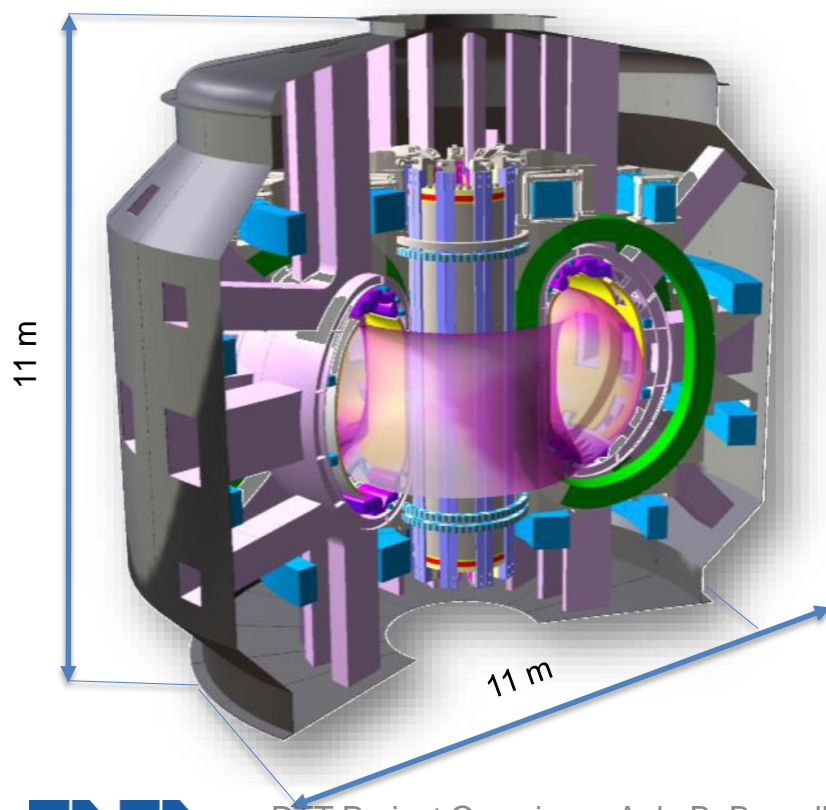


Technology choices relevant for DEMO

DTT main parameters

DTT

Main Parameters



R (m)	2.14
a (m)	0.65
I _p (MA)	5.5
BT (T)	6.0
V _{pl} (m ³)	33.0
P _{add} (MW)	45.0

Project information

- DTT time schedule is in line with the original one.
- **Budget secured – loan by EIB already granted.**
- **The biggest loan ever granted to a single research project: 250 million euros**
- **Final design** completed for the most critical components.
- Lay out of the main hall well advanced
- Licensing in progress
- First procurement: Nb₃Sn assigned in July 2019
- Construction time: **7 years**; Operation time: **25 years**
- **A new legal entity recently constituted for the Project realisation and exploitation**
- From now to the end of the 2019 several crucial tender will be launched.

Main intermediate milestones to be accomplished

- **DTT has to give fundamental indication for DEMO design in time for an effective DEMO design**
- **DTT has to start operation in 2026**
- **The Magnet system procurement is one of the components on the critical path**
- **Three TFC modules and six winding pack must be ready by end 2022**
- **The main part of the magnetic system are heavily interconnected: Strands, cable in conduit, Winding pack and integration, Casings.**
- **The procurement we are presented today are very crucial for the project success**
- **That means these procurement has to follow strictly the schedule since they impact each other.**

Other Procurements and services

DTT main procurements:

1. Superconducting Magnets:

Strands: Ni3Sn and NiTi

Cables

Magnets (coils+casings)

External structure

2. Vessel/In-Vessel

Vacuum Chamber

First Wall

Divertor

3. Power Supplies:

CS, PF, TF & protection systems

Additional heating

Auxiliaries

Distribution systems

4. Radiofrequency:

Ion Cyclotron: 4 MW at 90 MHz

Electron Cyclotron: 14 MW at 170 GHz

Neutral Beam Injector 7 MW

5. Cryocooler: 10 kW at 4.6 K

6. Control

7. Remote maintenance

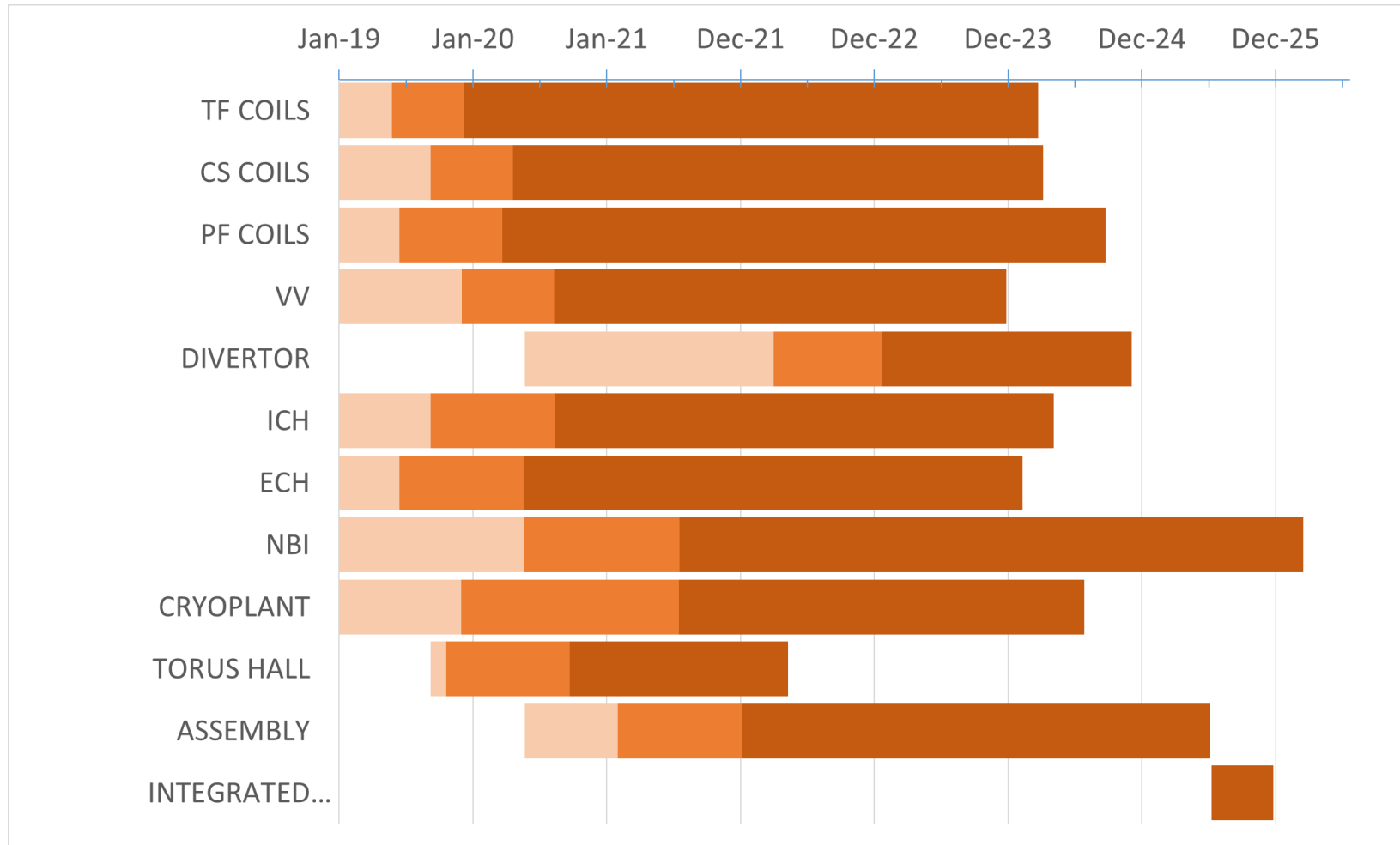
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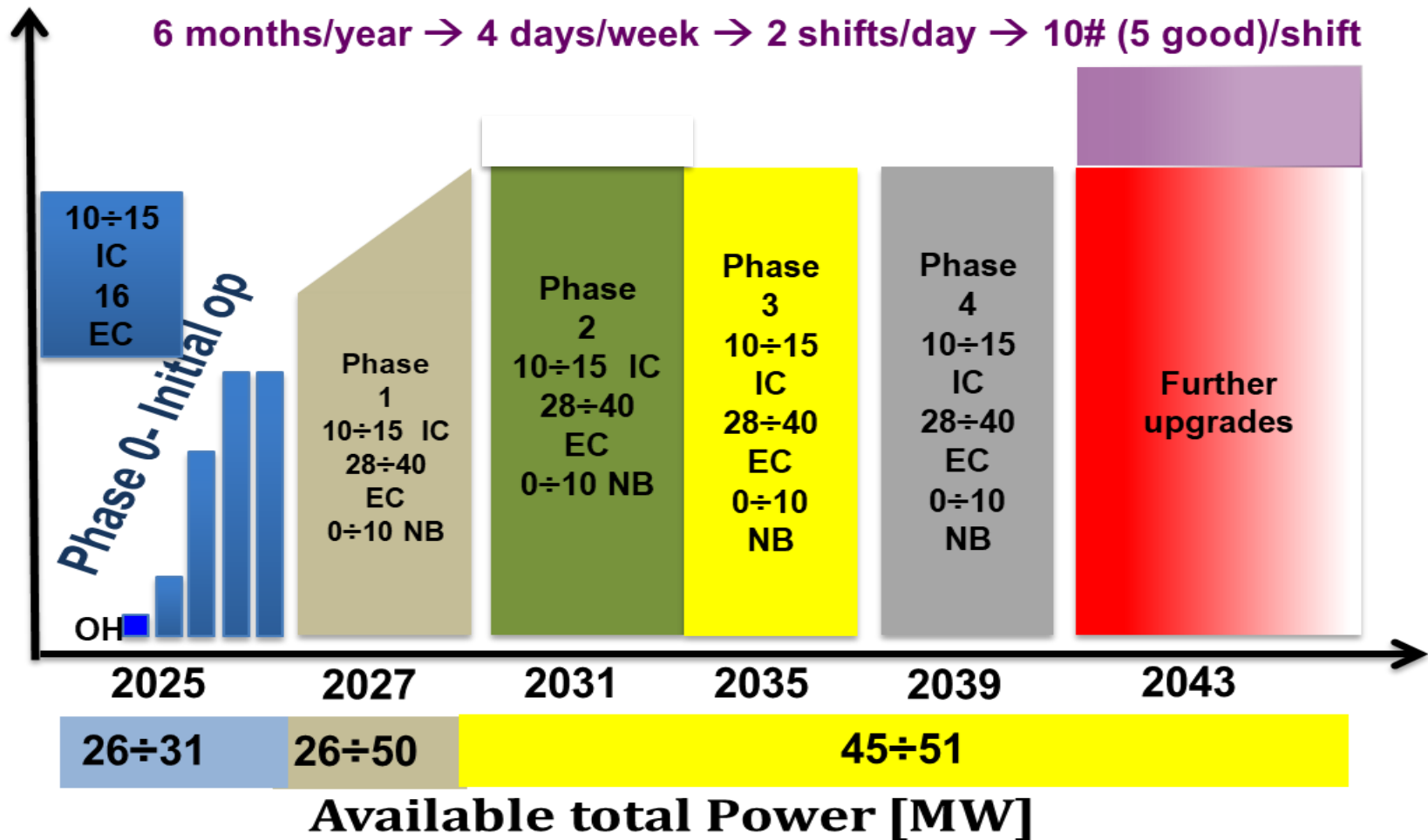
8. Buildings

9. Assembly

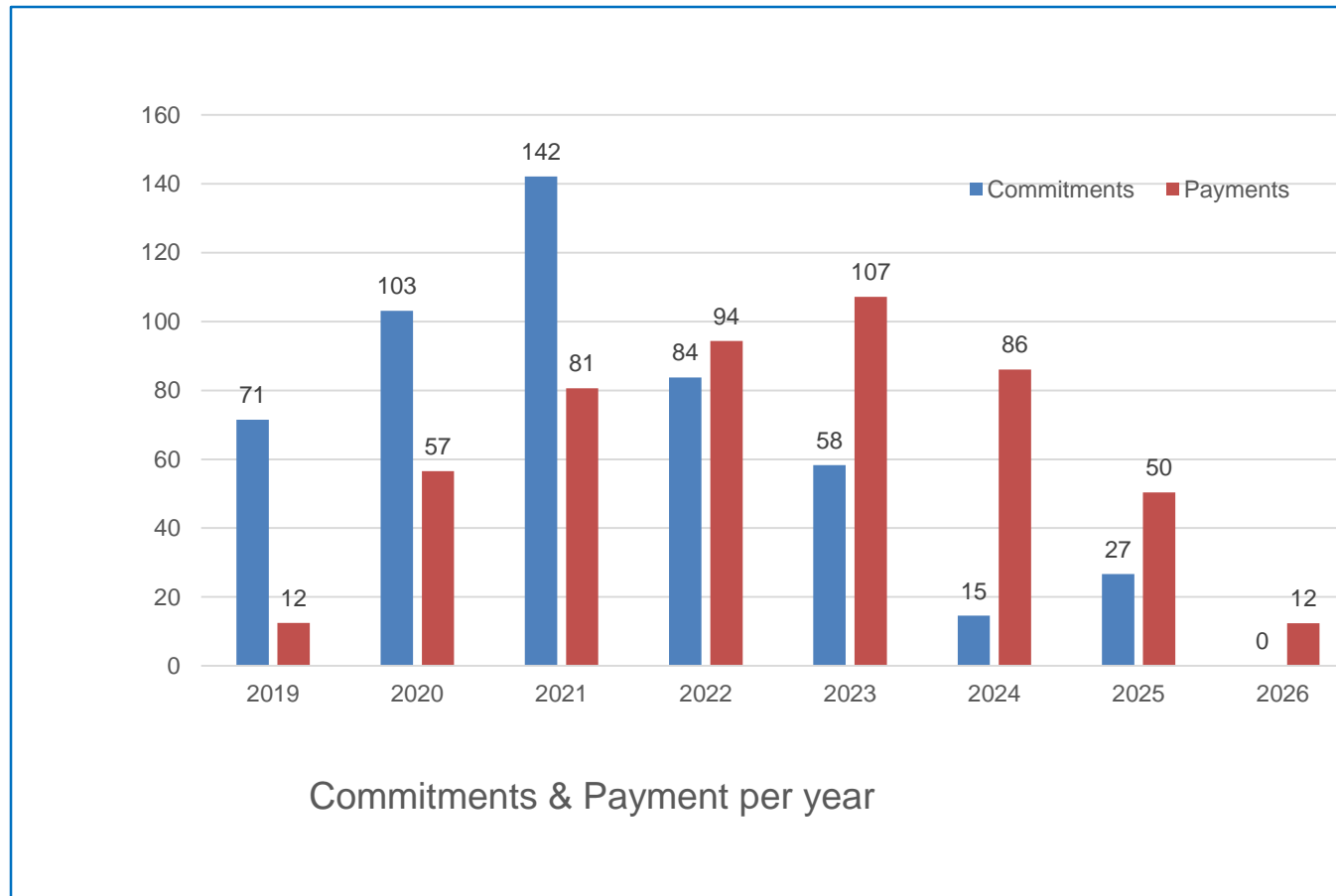
Planning of the main components and Phases



Planning of the experimental activity



Commitments and payment profile



Concluding remark

The success of a challenging enterprise like DTT requires a full dedicated team but also an Industrial system fully committed in the realization of demanding component and system

This information day is aimed at giving not only the rules of engagement but mainly to raise the awareness of how much is important for the project success the effective and fruitful commitment of industry

From our side we are ready to be as collaborative possible to tackle any difficulty may arise during the procurement.

As final recommendation I invite you to be very careful in the tender procedure since we are bounded by very severe rules.

QUESTIONS?



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