



Agenzia nazionale per le nuove tecnologie,
l'energia e lo sviluppo economico sostenibile

ESNII: European Sustainable Nuclear Industrial Initiative

Roma February 9

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ESNII: the actors

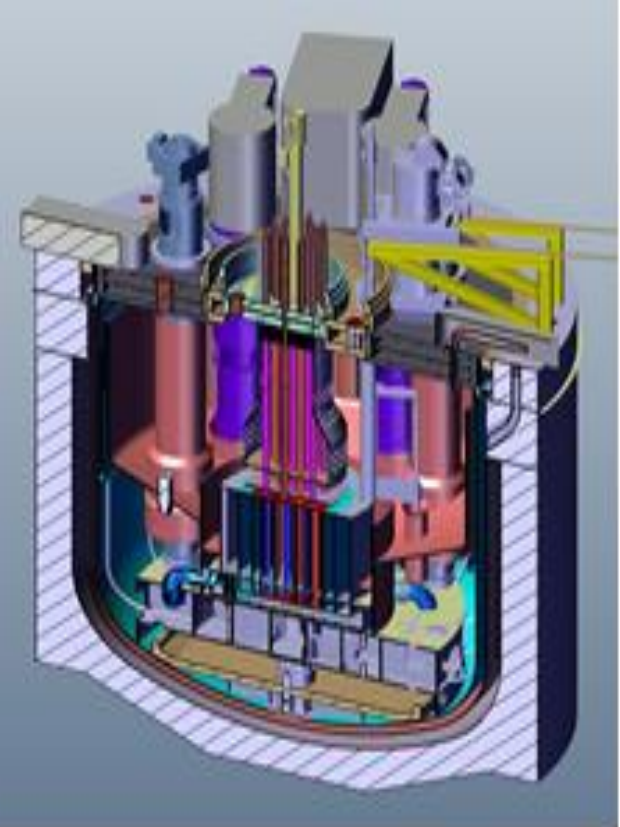
- For manageability, the ESNII Task Force decided to set up a 2-level structure:
 - Executive Board: **leaders of the ESNII projects** (ASTRID, MYRRHA, ALFRED, ALLEGRO)
 - Task Force: all members
- The **ESNII Task Force**
 - *Memorandum of Understanding* under SNETP umbrella
 - 13 founders, now 24 members
 - Balance between industry and research (12 & 12)

Industry

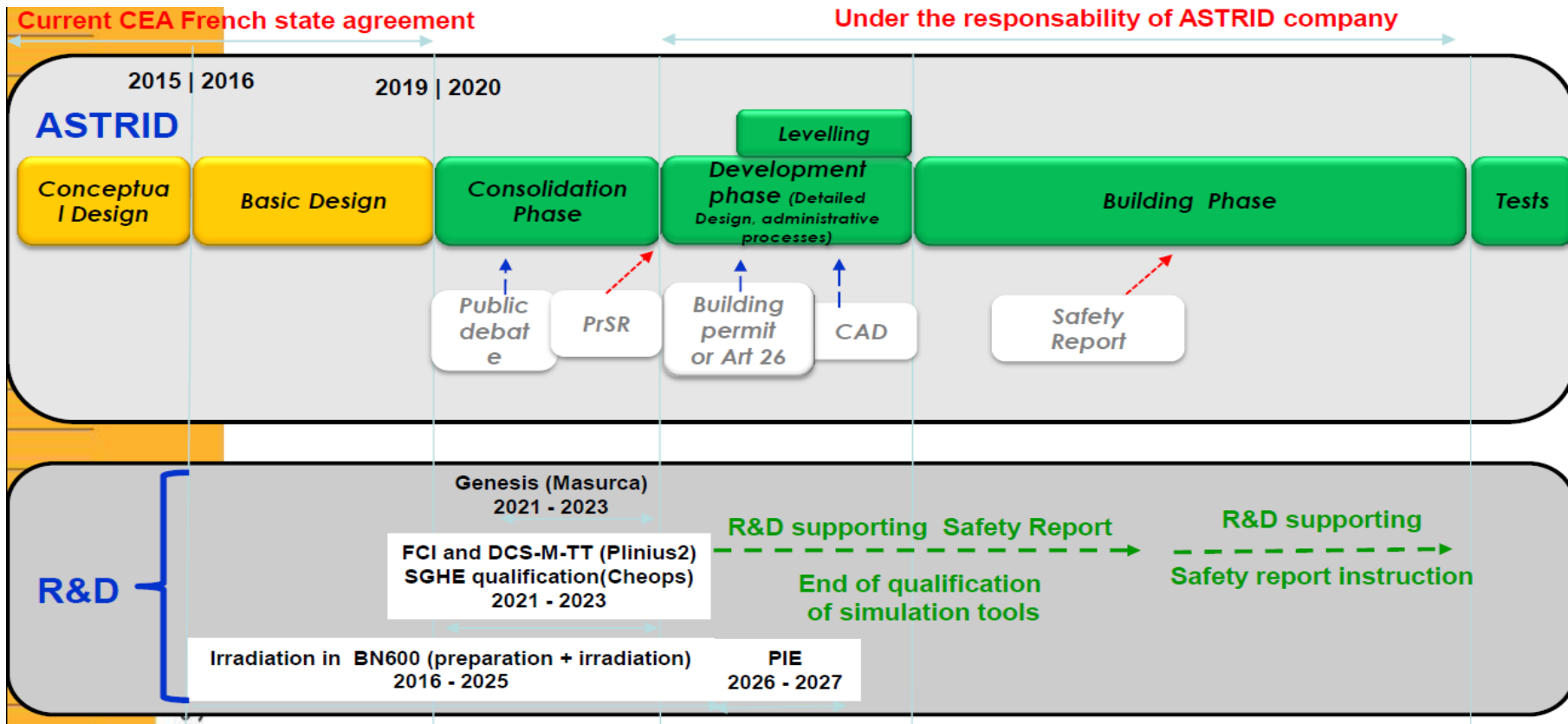
Research



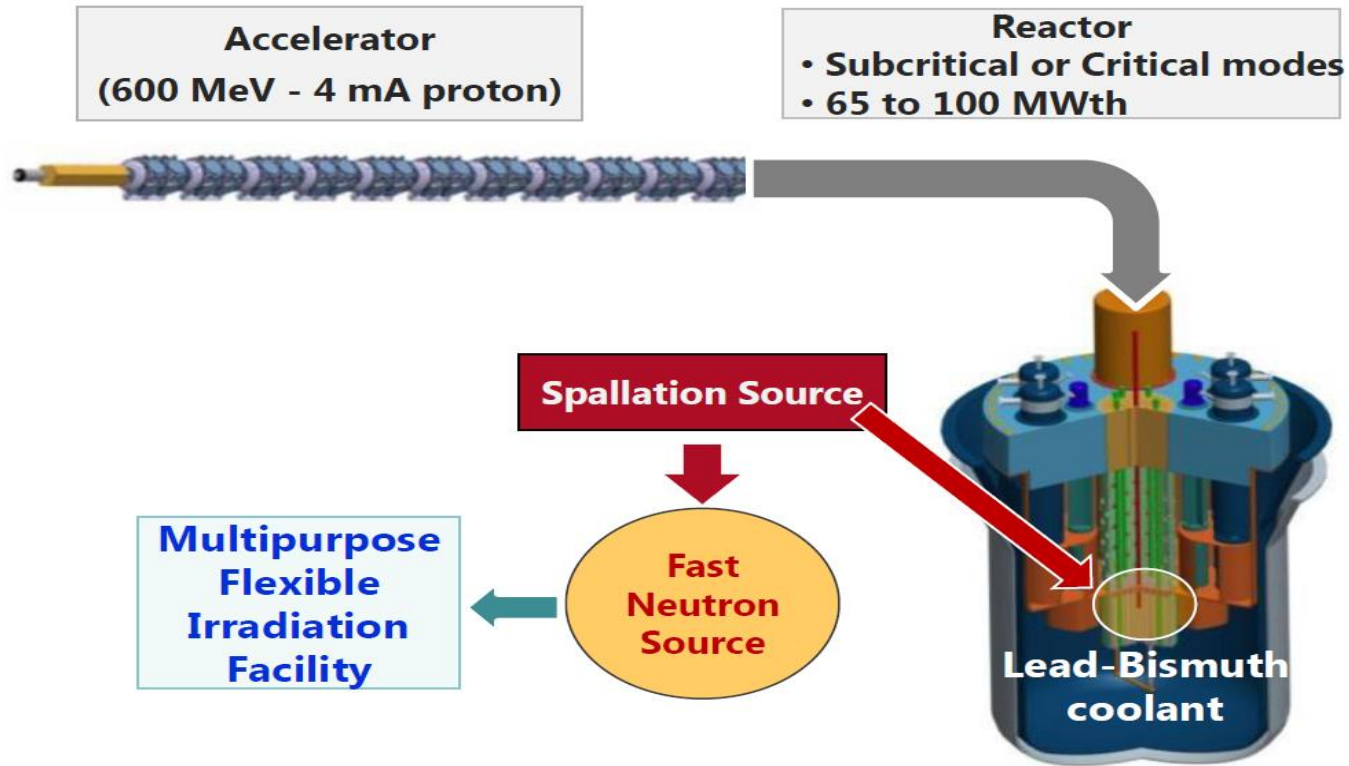
ASTRID



ASTRID TIME SCHEDULE



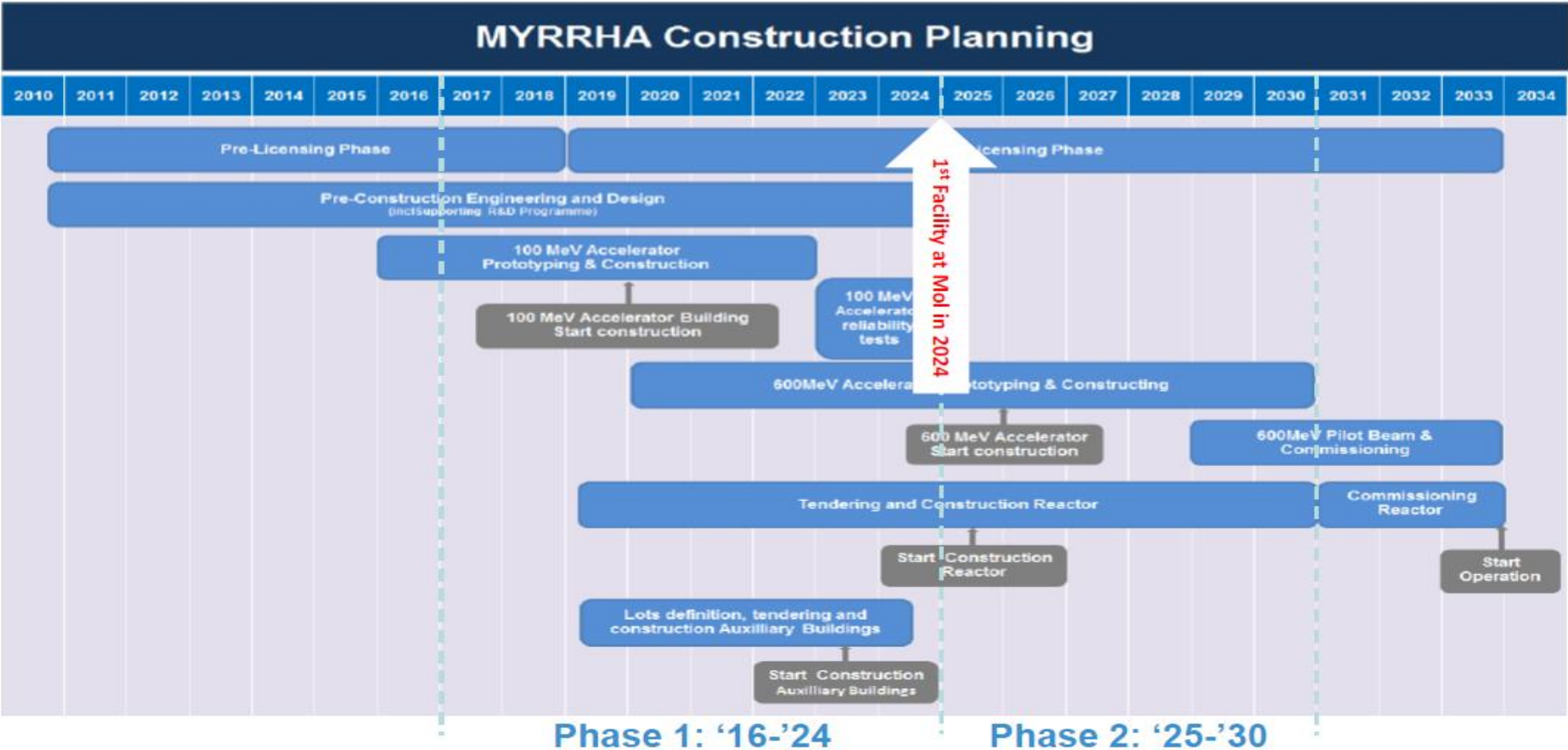
MYRRHA



MYRRHA: New implementation approach

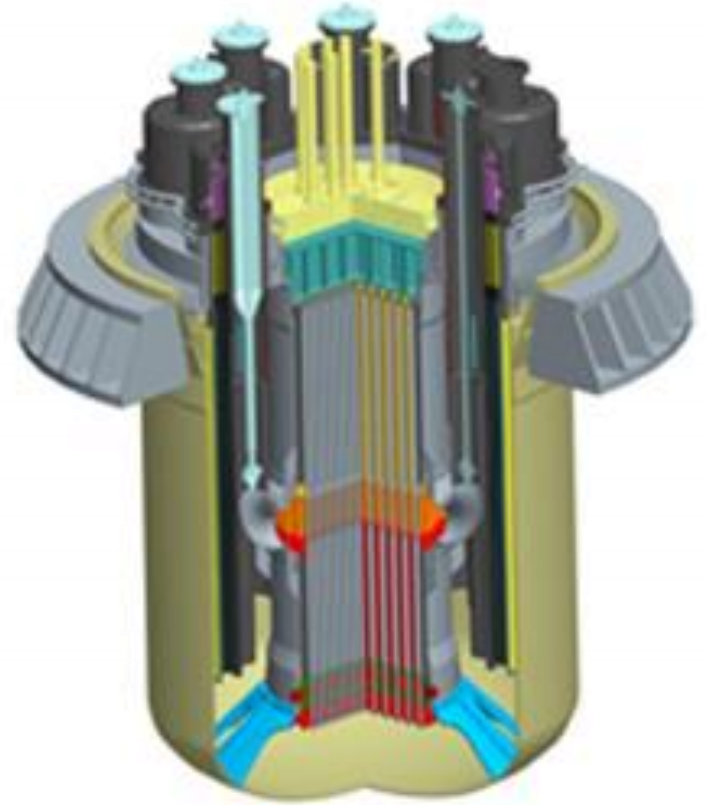
- In 2015, SCK•CEN investigated three scenarios for the implementation of MYRRHA:
 - SC1: Accelerator first + Reactor later
 - SC2: Reactor first + Accelerator later
 - SC3: Accelerator and Reactor all together
- In December 2015, SCK•CEN Board selected Scenario one (SC1) as the most appropriate approach for the realisation of MYRRHA. This scenario consists of a phased approach (Phase 1 = 2016-2024)
 - Eliminating the technical risks
 - Spreading the investment cost
 - Allowing first R&D facility available by 2024

Global high-level planning MYRRHA Project (2016-2030)

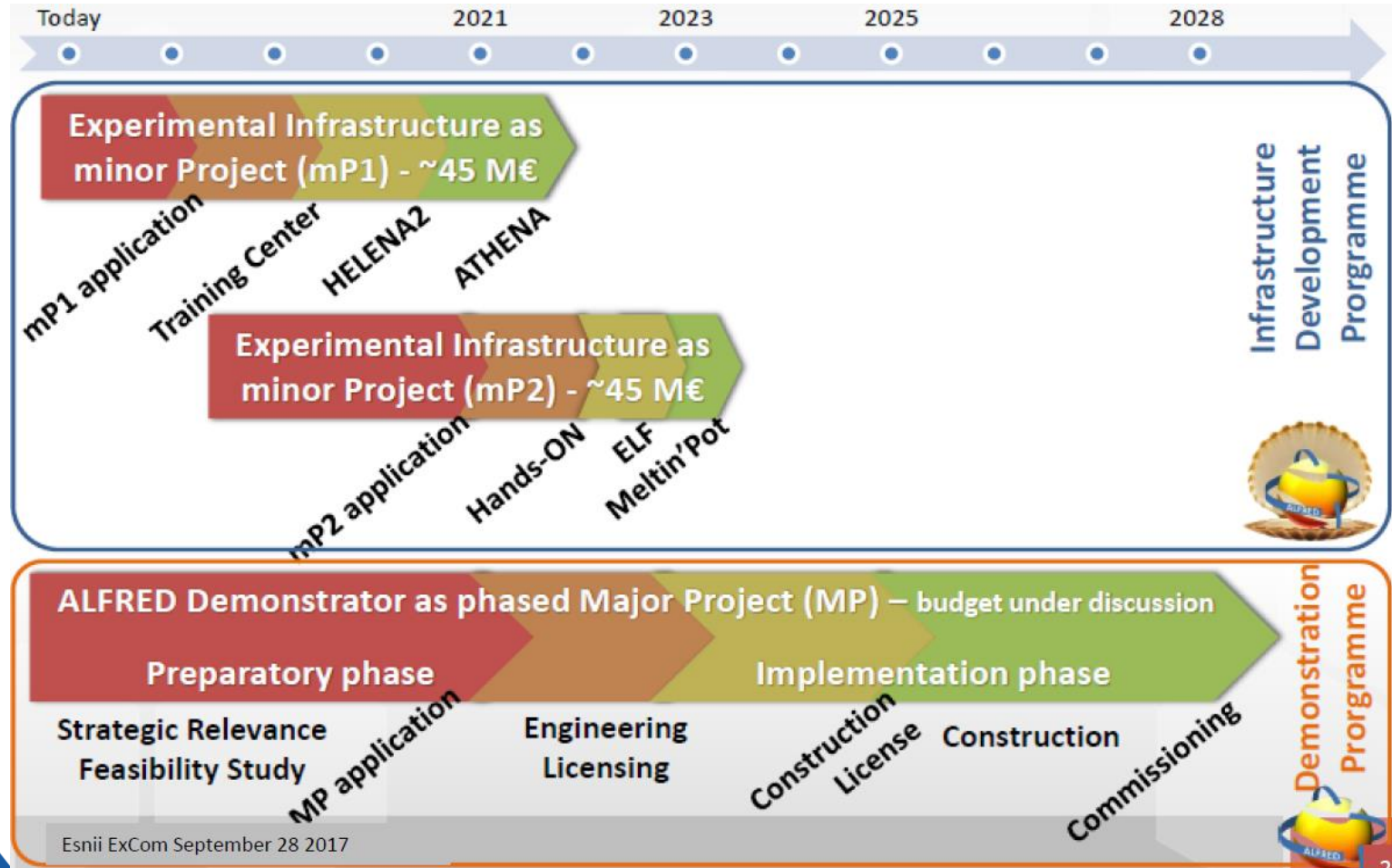


ALFRED Lead Technology

- FALCON consortium formed in december 2013 between ENEA, Ansaldo Nuclear and Roumanian R&D Institute ICN
- Technical Review of the design in 2014, with 8 points under review
- The TSO IRSN also requested changes in the SG technology (inside the Reactor vessel)
- Doubledwall Steam Generators compulsory in ALFRED as in MYRRHA



Multi-annual Funding scheme



ALFRED Status

In last May at Nuclear 2017 Conference, **Romania Prime Minister expressed Government support**

ALFRED project was included in the “Raport privind infrastructurile de cercetare din România” CRIC - SEPTEMBRIE 2017

ALFRED project supported by ROMATOM position paper
STRONG INDUSTRIAL INTEREST

Licensing discussion with **CNCAN** started
FALCON actively working on LBD (Licensing Basis Documents)

SITE already available in Mioveni (public discussion)

Strong Commitment by Romania

**Romania National Research Plan 2015-2020 updated on
Monday 22 January 2018**

At point 5. ALFRED included in the main European initiatives

Point 15 introduces a new subprogram 5.5

**Program for Research, development and innovation for Generation IV
reactor ALFRED**

Type of project to be supported:

- RDI project, experiments and simulation**
- Support feasibility study for the infrastructure and Major Project application**
- Support Management activities**

ESNII Support Request

ALFRED project achieved an higher level of maturity
(it was already indicated as short term option in previous SRIA)

ALFRED respect all conditions for entering the demo Fast Track

For this reason FALCON is asking the ESNII:

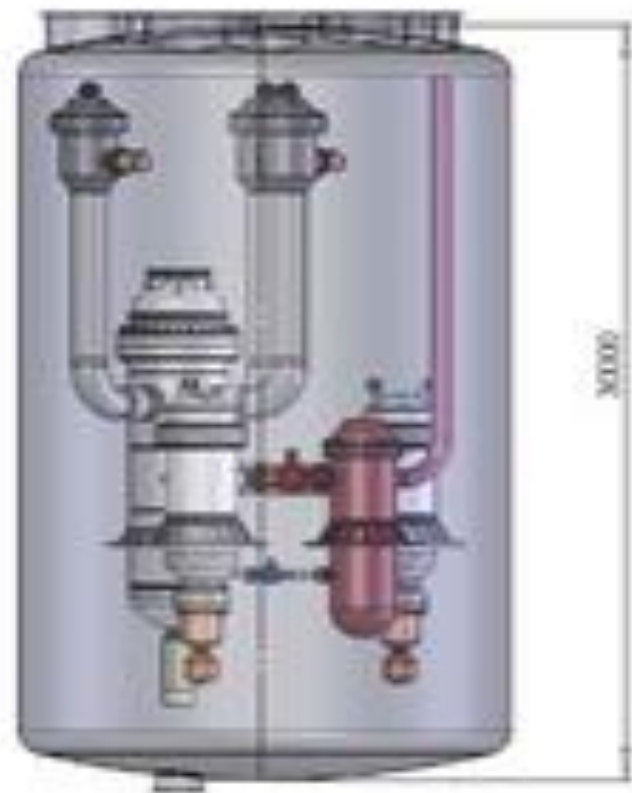
To acknowledge its advancements

To reckon its sensibly higher maturity

To sustain our requests for a higher support from EC and RO

- *Discussion will take place on March 21*

ALLEGRO



ALLEGRO - progress

- Reduce ALLEGRO power from 75 MWth to cca 10 MWth and optimize the core configuration
- To increase main blowers inertia (Management of LOCA and SBO), gas turbine coupled to the primary blowers
- Switch to UO₂ pellet in AIM1 cladding instead of MOX fuel and develop in phase 2 a ceramic design

Results of ESNII and orientations for the future

- The projects will need **public support and acceptance from the research community at large** → financing
- ESNII **promotes** 4 main projects **but does not distribute money**
- Its important accomplishments are **strategic prioritisation**, **coordination of research and of European research teams** and **technical advice** to emerging projects
- Priorisation was done with regard to technologies and projects
- In the technical field it has achieved **some harmonisation of fast reactor fuel R&D in Europe**.
 - This is not the case in the Generation IV International Forum (GIF), in Asia (3 fuels), in Russia(3 fuels).
 - For the next 20-25 years, Europe through ESNII will use one R&D fuel : **mixed uranium and plutonium oxide, (pelletized) MOX**
- The 4 projects **will need long term research** in parallel with project detailed design and construction