

Sustainable Nuclear Energy Technology Platform

- *ESNII – European Sustainable Nuclear Industrial Initiative*
- *NC2I – Nuclear cogeneration*
- *NUGENIA – Nuclear Gen II & III Association*

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About SNETP



- SNETP was **set up in 2007 under the auspices of the European Commission**, to gather stakeholders building a common vision: industry, research centres, safety organisations, universities, non-governmental organisations, SMEs, etc.
- SNETP's official **European Technology Platform label** was renewed in 2013.
- The overall goal is to **support technological development** for enhancing safe and competitive nuclear fission in a sustainable energy mix, as part of the EU's **SET-Plan**:
 - Low greenhouse gas emissions
 - Security of energy supply for Europe
 - Stable electricity prices
- R&D is necessary to **further enhance the safety and sustainability** of nuclear fission, and to **open new markets**
- SNETP has expressed its **strategic orientations** around **three technological pillars**, and launched **task forces** to implement them

SNETP's History



- Sept 2007: SNETP launch with Commissioners for Research and Energy, publication of *Vision Report*
- June 2009: **Strategic Research Agenda**
- May 2010: *Deployment Strategy*
- Nov 2010: Launch of ESNII
- Oct 2011: Launch of NC2I
- March 2012: Launch of NUGENIA
- Jan 2013: Publication of "*Identification of Research Areas in Response to the Fukushima Accident*"
- Feb 2013: Updated *Strategic Research & Innovation Agenda*
- 2014-2015: NUGENIA Roadmap & Global Vision
- 2015: SNETP **Deployment Strategy**
- Dec 2017: NC2I *Vision Paper*
- June 2019: *SNETP Evolution towards a legal entity*



Documents available for download on www.snetp.eu and prints upon request (secretariat@snetp.eu)

Vision: 3 strategic pillars matching SET-Plan priorities

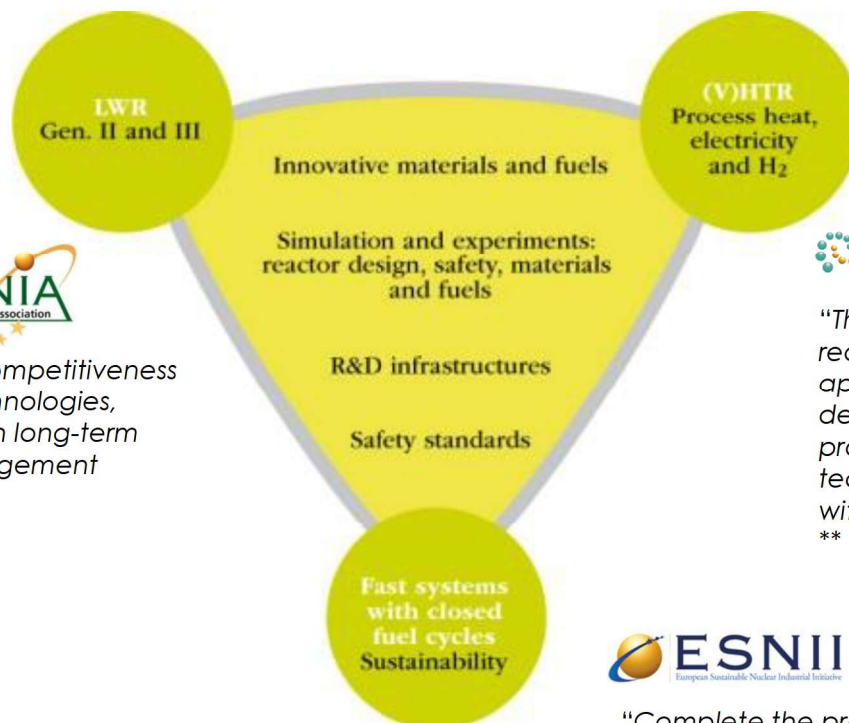


"Maintain competitiveness in fission technologies, together with long-term waste management solutions" *

SET Plan Objectives

(*) [COM/2007/0723 final]

(**) [COM/2009/0519 final]



"The first cogeneration reactors could (...) appear within the next decade as demonstration projects to test the technology for coupling with industrial processes" **



"Complete the preparations for the demonstration of a new generation (Gen-IV) of fission reactors for increased sustainability"*

1. NUGENIA – Purpose & Objectives



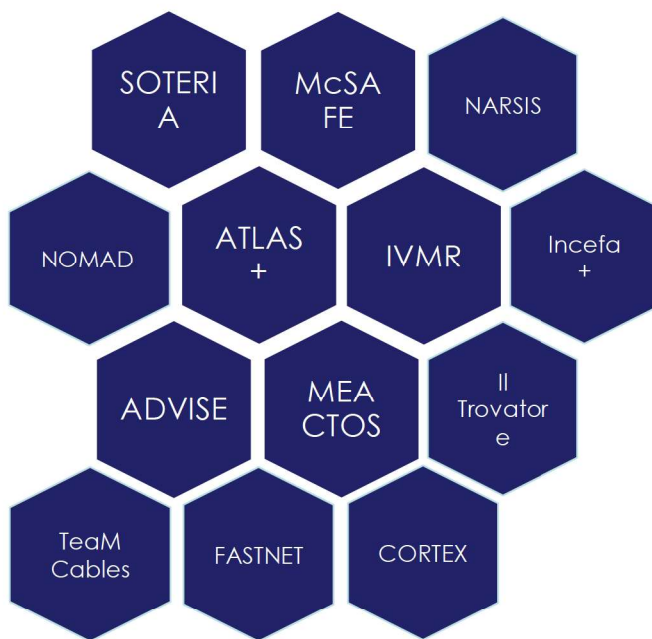
- **What is NUGENIA?** an international non-profit association founded under Belgian law in November 2011 and launched in March 2012.
- **Mission:** be an integrated framework for safe, reliable and competitive Gen II & III fission technologies, which:
 - Fosters collaboration between industry, SMEs, RTOs, academia and technical safety organisations
 - Builds knowledge and expertise
 - Generates results with added value
- **Organisation of the R&D activities** around 8 technical areas
- **Projects**
 - 13 Euratom projects ongoing under H2020 & 6 in-kind projects
- **Membership:** 101 full members and 8 honorary members from 24 countries (as of October 2018)



1. NUGENIA – Project Portfolio



13 H2020 Euratom ongoing projects



- **SOTERIA** (CEA): Safe LTO of LWR (Degradation of RPV and RVI, follow-up project of FP7 projects PERFORM60 & LONGLIFE);
- **Mc Safe** (KIT): High-Performance Monte Carlo Methods for SAFETY Demonstration – From Proof of Concept to realistic Safety Analysis and to Industry-like Applications
- **INCEFA+** (AMEC): INcreasing Safety in NPPs by Covering gaps in Environmental Fatigue Assessment
- **IVMR** (UJV): Management Strategy of In-Vessel Melt Retention in existing and future NPPs
- **ATLAS +** (VTT): Advanced Structural Integrity Assessment Tools for Safe Long Term Operation
- **MEACTOS** (CIEMAT): Mitigating EAC Through Optimisation of Surface condition
- **ADVISE** (FDF): Advanced Inspection of Complex Structures
- **NOMAD** (IZFP): NDE System for the inspection of operation-induced material degradation
- **T&M CABLES** (EDF): European Tools and Methodologies for an efficient ageing management of nuclear power plant cables
- **Il Trovatore** (SCK-CEN): Innovative cladding materials for advanced accident-tolerant energy systems
- **CORTEX** (IRSN): Non-Intrusive Core Monitoring Techniques Relying on Inherent Reactor Dynamics
- **FASTNET** (IRSN): Fast Accident Source Term tools for Emergency Centers
- **NARSIS** (CEA): New Approach to Reactor Safety Improvements

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The projects have received funding from the European Union's Horizon 2020 research and innovation programme

3. ESNII – European Sustainable Nuclear Industrial Initiative



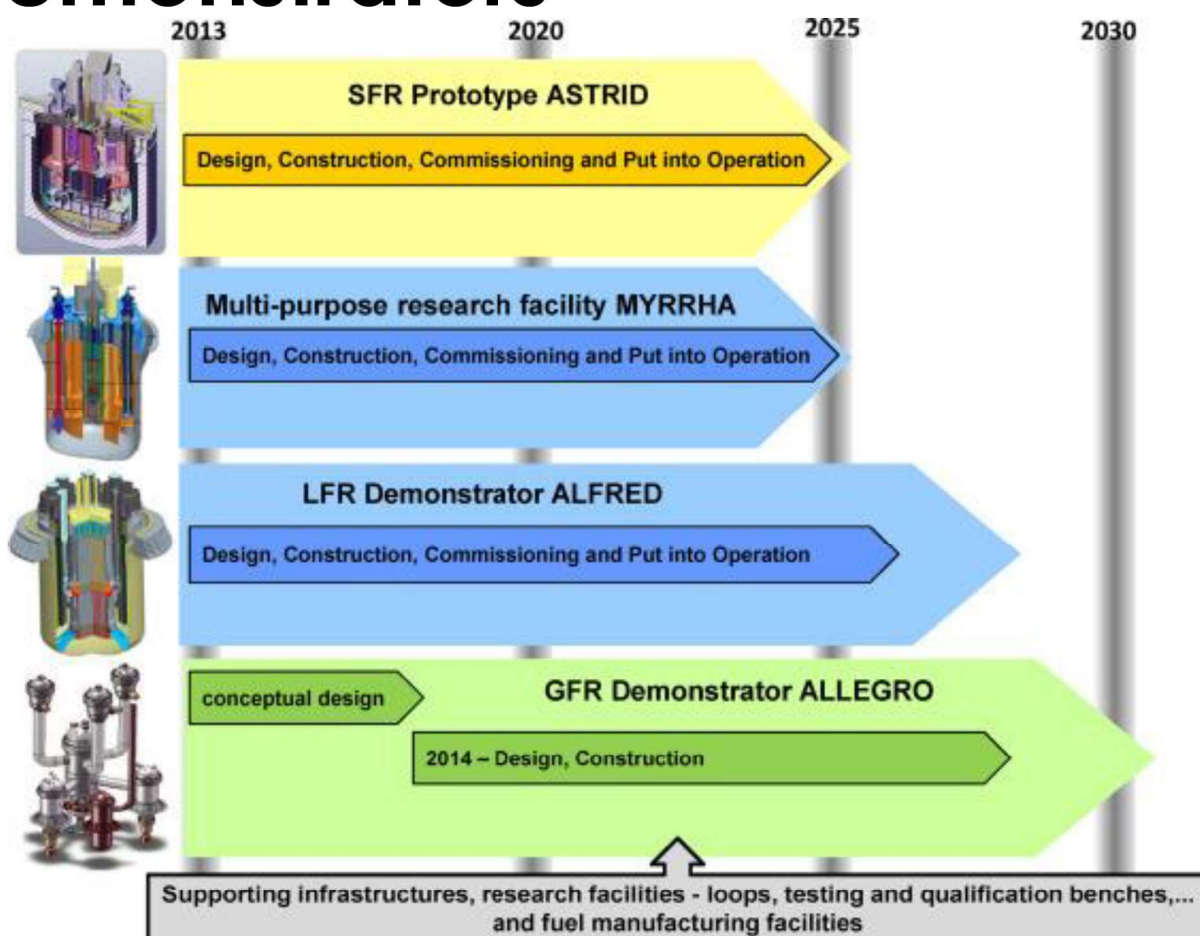
- **Framework**

- European Industrial Initiatives (EIs) constitute key elements of Europe's **SET-Plan**.
- ESNII was formally launched at the SET-Plan Conference in Brussels on 15 November 2010

- **Purpose and scope**

- ESNII addresses the need for demonstration of **Gen-IV Fast Neutron Reactor technologies**.
- In 2019, ESNII reopened the discussions on the evaluation of the “ESNII Projects & System maturity” using two criteria: the technology readiness level (worldwide) and the advancement of a particular project in Europe.
 - Even though the Lead(-bismuth) Fast Reactor technology is not largely deployed worldwide, **MYRRHA** should be considered as the number one Generation IV project in Europe, considering its project advancement & good future perspectives.
 - SFR & LFR projects (**ASTRID & ALFRED**) should be ranked second as, despite the situation of ASTRID, Sodium is still the reference technology at the international level and considering that ALFRED project offers good perspectives even though the technology is less mature.
 - The Gas Fast Reactor technology is considered as a longer-term alternative option (**ALLEGRO**)

ESNII Demonstrators

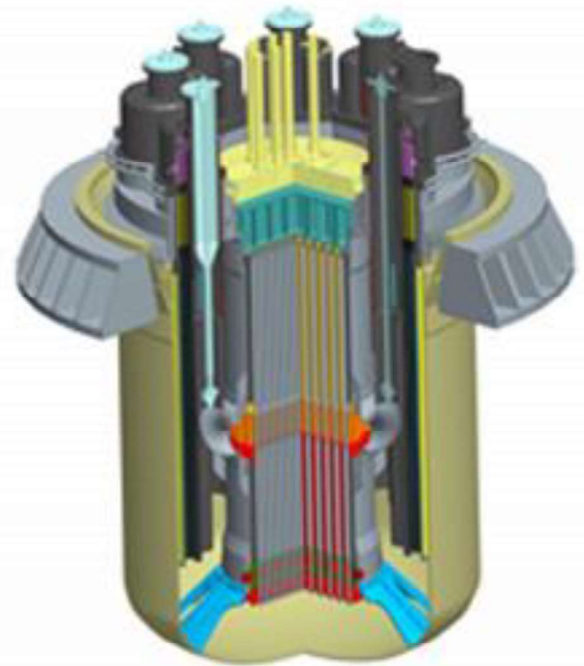


ALFRED Lead Technology

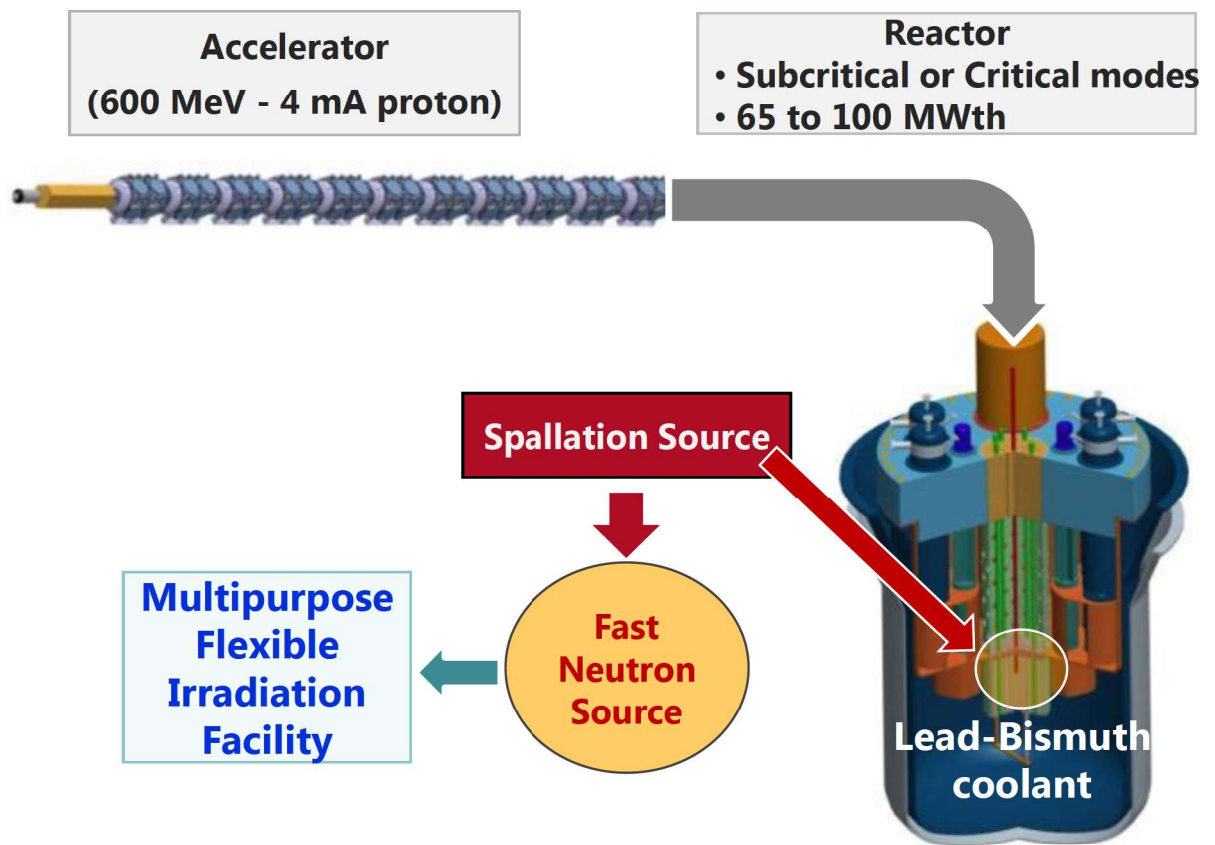


SNETP
SUSTAINABLE NUCLEAR ENERGY
TECHNOLOGY PLATFORM

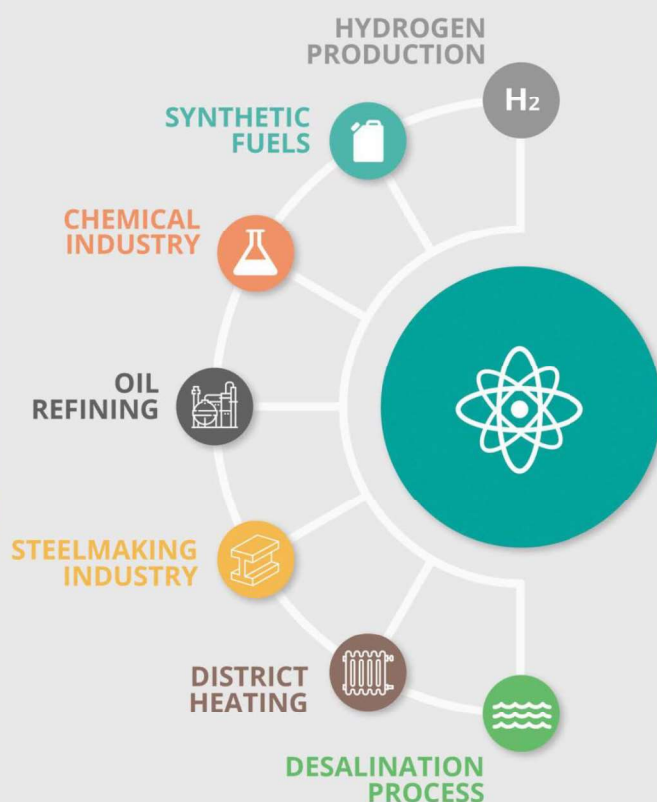
- FALCON consortium formed in december 2013 between ENEA, Ansaldo Nuclear and Roumanian R&D Institute ICN
- Applications for ALFRED to become part of ESFRI project and to obtain Roumanian Structural Funds
- Technical Review of the design in 2014, with 8 points under review
- The TSO IRSN also requested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



MYRRHA



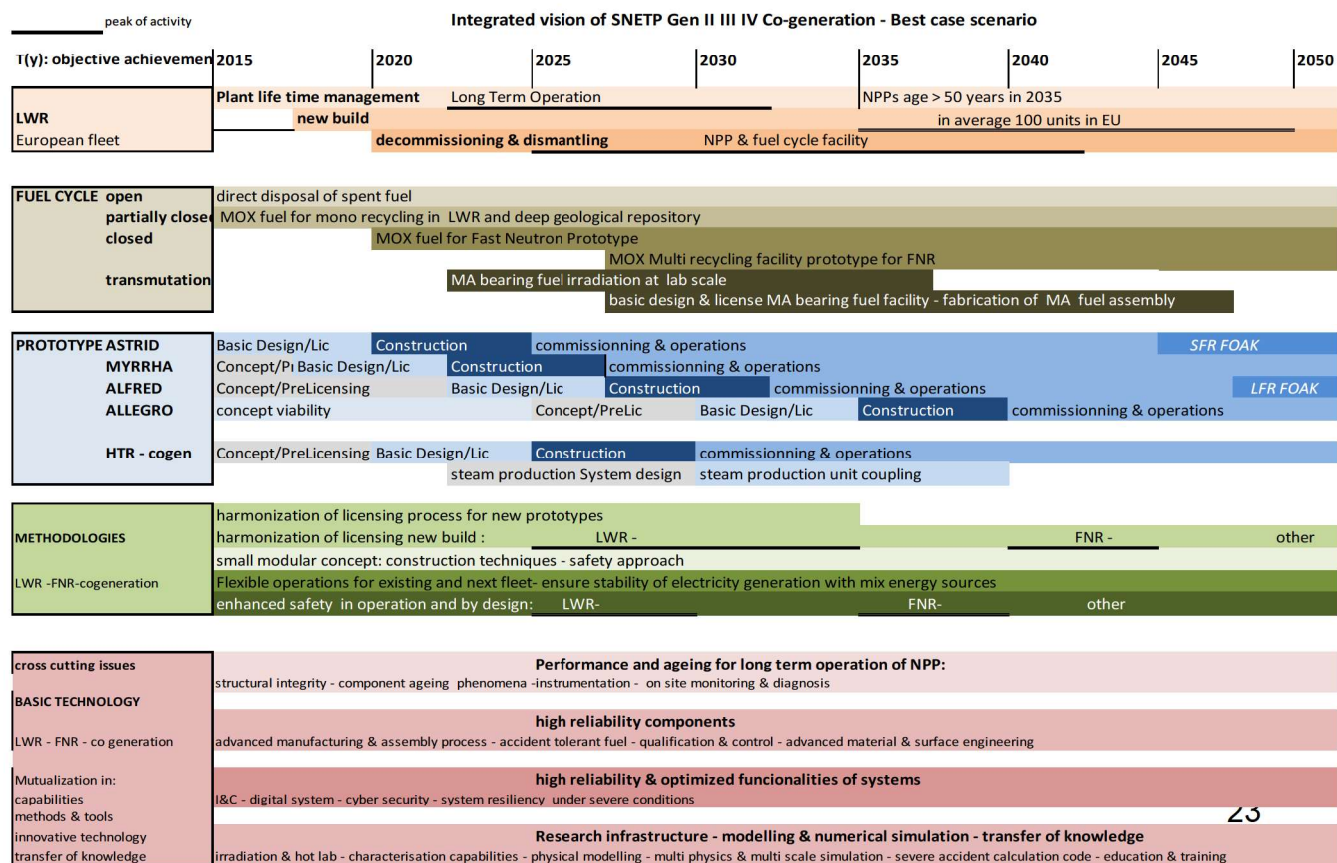
2. NC2I Nuclear cogeneration



Contribute to clean and competitive energy beyond electricity by facilitating deployment of nuclear cogeneration plants



SNE-TP Deployment Strategy



SNETP Evolution Timeline until April 2019



Next steps:

- **End Nov/Dec 2018:** Consolidation of the remarks and preparation of a new version by the SNETP Evolution TF
- **11-12 Dec 2018 :** NUGENIA ExCom
 - Discussions on the evolution of NUGENIA's governance
 - Last remarks on the statutes
- **Mid-January 2019:** Distribution of another draft of the statutes on a shared platform open to the whole SNETP Community
- **Mid-February 2019:** Closing of the webpage and consolidation/ integration of the remarks by the TF
- **End-February 2019:** Final version issued by the TF
- **March 2019 :** Review by legal departments
- **April 2019 :** NUGENIA GA

Thank you for attention

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