SNETP

An overview of Europe's

Sustainable Nuclear Energy Technology Platform

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www.SNETP.eu

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

Vision: 3 strategic pillars matching SET-Plan priorities

SNETP
Sustainable Nuclear Energy Technology Platform

NUGENIA
NUclear GENeration II & III Association

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

NC2I
Nuclear Cogeneration Industrial Initiative

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

ESNII
European Sustainable Nuclear Industrial Initiative

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

SET Plan Objectives
(*) [COM/2007/0723 final]
(**) [COM/2009/0519 final]

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SNETP for European RD&D

Pan-European fission R&D and the role of SNETP?

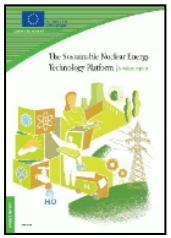
1. Jointly share and develop best-practice to ensure safe operation of existing nuclear facilities
2. Enable assessment of new technologies through pooling resource (finance, intellectual) and sharing of infrastructure
3. Promotes pan-European industry engagement in globally competitive markets
4. Enables coherent approach within Europe and externally when facing international partners
5. Facilitates EU harmonisation, particularly for safety
6. Enhances researcher education, training and EU mobility

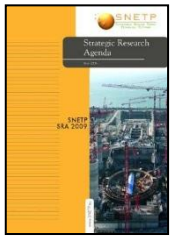
SNETP is in line with its expected ETP role (as defined by the EC):

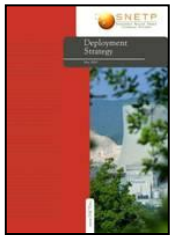
1. Deliver "Research and innovation agendas": SRA in 2009, SRIA in 2013
2. Act as "Open innovation platform": ESNII, NUGENIA, NC2I bring together actors of industry & research
3. Ensure "Partnership with MS and MS based platforms": dialogue is ensured via individual members, joint programming happens in practice

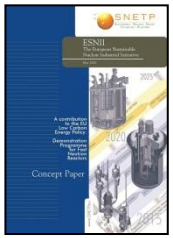
SNETP's main milestones

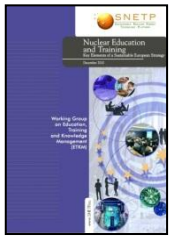
- Sept 2007: SNETP launch with Commissioners for Research and Energy, publication of *Vision Report*
- June 2009: *Strategic Research Agenda*
- May 2010: *Deployment Strategy*
- Nov 2010: Launch of ESNII
- Jan 2011: *Education & Training Strategy*
- Oct 2011: 100th member of SNETP ; launch of NC2I
- 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
- *Foreseen Q4 2015: Updated Deployment Strategy*
- *Foreseen end 2015: NC2I Concept Paper*











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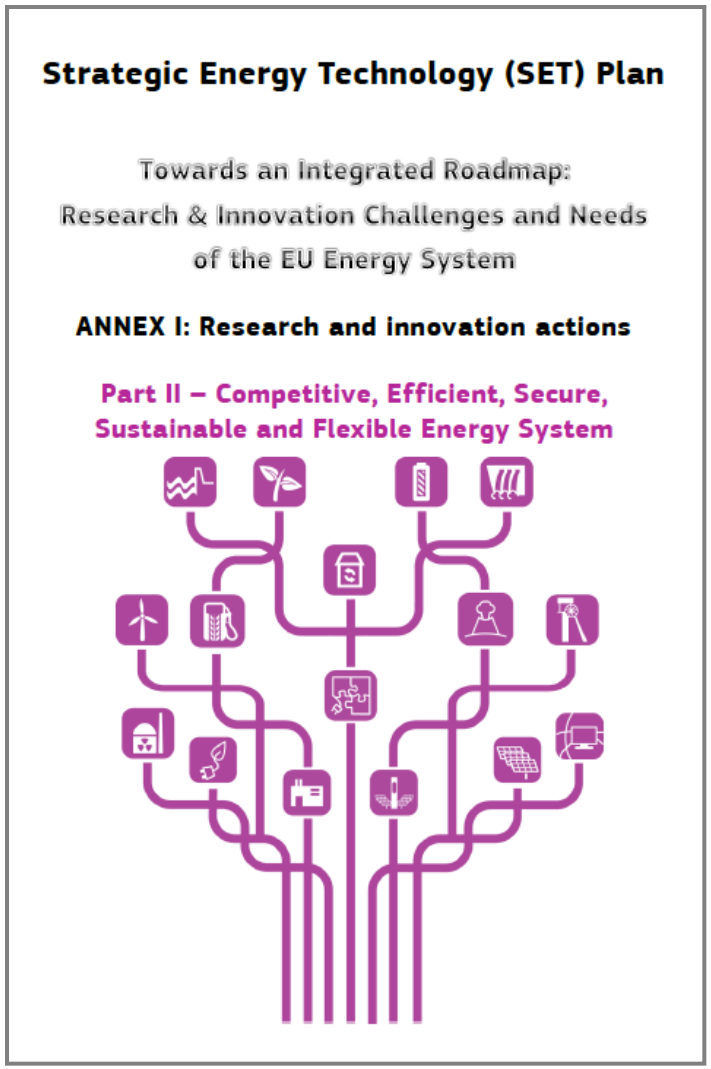
Documents available for download on www.snetp.eu and prints upon request (secretariat@snetp.eu)

Contribution of SNETP

SET Plan Integrated Roadmap and Action Plan



HEADING 5: Supporting Safe Operation of Nuclear Systems and Development of Sustainable Solutions for the Management of Radioactive Waste

Challenge 1: Safe and Efficient Operation of Nuclear Power Plants

Challenge 2: Sustainability of Waste Management and Use of Fuel Resources

Challenge 3: Optimized Integration of Nuclear Reactors in Energy Systems

NUGENIA overview

- NUGENIA is an international non-profit association founded under Belgian legislation in November 2011 and launched in March 2012
- Its mission is to 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

- 106 full members and 7 honorary members from 24 countries (as of Sep' 2015)

NUGENIA technical scope

1. Plant Safety and Risk
2. Severe Accidents
3. Improved Reactor Operation
4. Integrity of Systems, Structures and Component
5. Fuel Development, Waste & Spent Fuel Management and Decommissioning
6. Innovative LWR Design & Technology
7. Harmonisation
8. In-Service Inspection and Qualification

Cross-cutting areas

- Each of the Technical area (TA) has a leader and various sub-area leaders
- Each Technical area organises at least one meeting per year

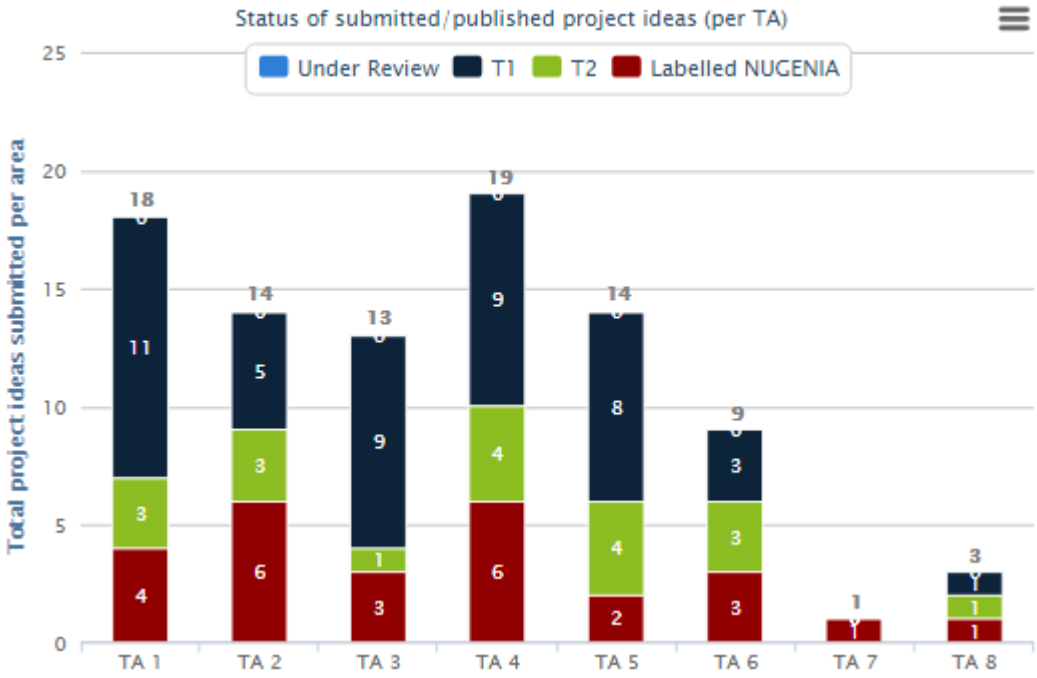
NUGENIA high level objectives

- **Objectives identified in NUGENIA Roadmap (2013) and detailed in the « Global vision » document (2015):**
  - Improve safety in operation and by design
  - High reliability and optimized functionality of systems
  - High reliability of components
  - Improve modelling of phenomena in NPPs
  - Increase public awareness
  - Efficient integration of NPPs in the energy mix
  - Prepare the future to avoid technology obsolescence
  - Performance and ageing of NPPs for long term operation

NUGENIA projects

- NUGENIA **Project portfolio** gathers 30 running or finished R&D projects

- NUGENIA **Open Innovation project creation process** allows for labelling most promising project ideas



ESNII – European Sustainable Nuclear Industrial Initiative

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

- ESNII addresses the need for demonstration of **Gen-IV Fast Neutron Reactor technologies**, together with the supporting research infrastructures, fuel facilities and R&D work.

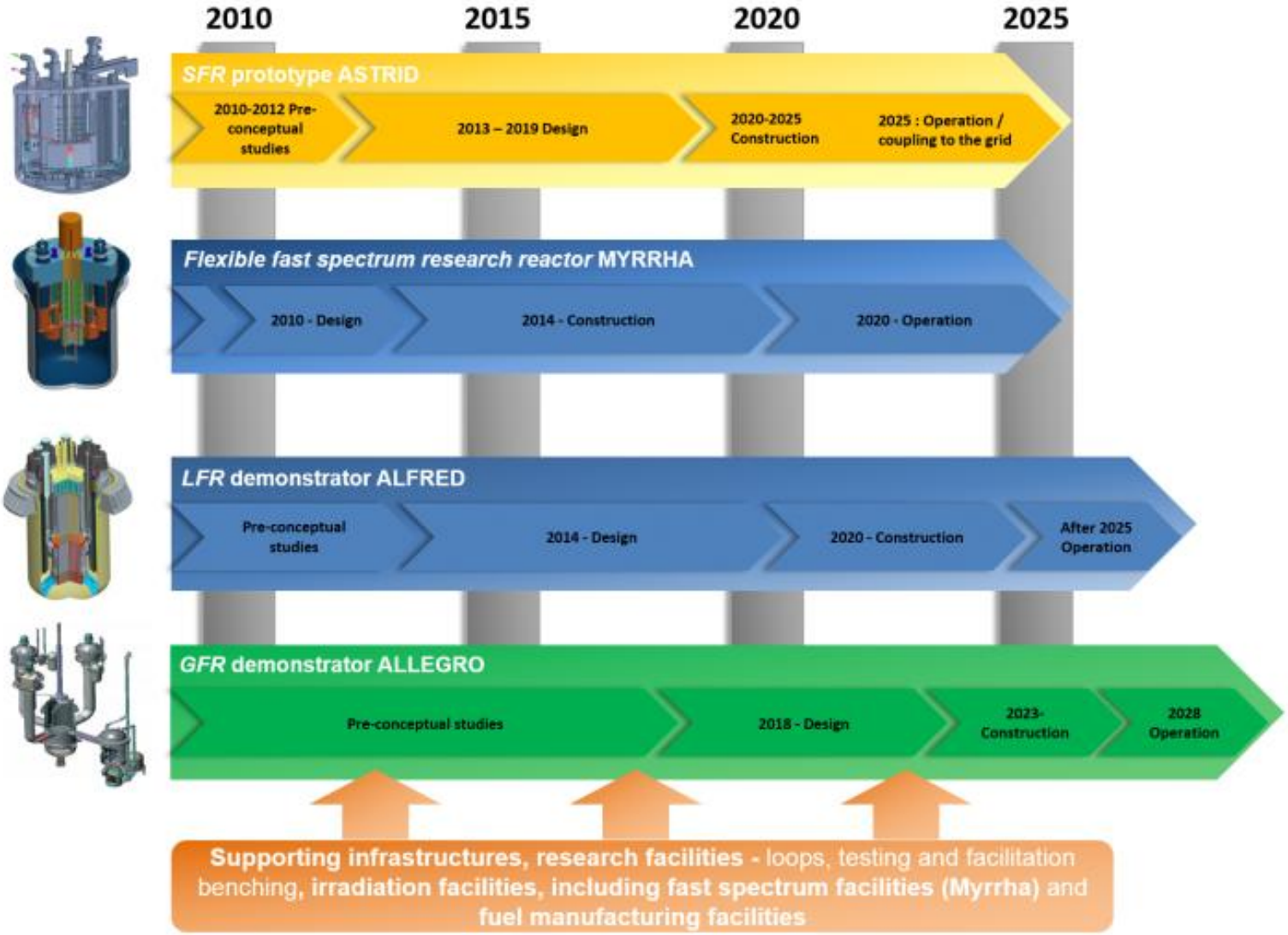
ESNII
European Sustainable Nuclear Industrial Initiative

ESNII Concept Paper (October 2010)

ESNII approach for GEN IV & closed fuel cycle

- SNETP has prioritised the different Gen-IV systems and following projects are under development:
  - **The sodium-cooled fast neutron reactor technology (the ASTRID project)** as the reference solution, with the construction of a prototype around 2020 in France
  - As a first alternative technology, the **lead-cooled fast reactor (ALFRED)** with the construction of an experimental reactor to demonstrate the technology, and supported by a lead-bismuth irradiation facility project in Belgium **(MYRRHA)**
  - As a second alternative technology, the **gas-cooled fast reactor (ALLEGRO)**, also requiring the construction of technology demonstrator in a European country.

ESNII roadmap



SNETP's vision for the future

- Nuclear fission will continue to play an **important role in the energy mix**, whatever the scenario (*Energy Roadmap 2050*)
- **Post-Fukushima R&D** has been identified, including for the LTO of existing reactors
- SNETP fully aligns with the strategic objectives to support the **utmost levels of nuclear safety** and **increase the sustainability** of nuclear energy (radioactive waste minimization, optimization of the use of nuclear materials)
- In addition to national programmes SNETP counts on **European legal and financial instruments** (Horizon 2020, Structural Funds, EIB loans, EIT KIC InnoEnergy…) to foster joint programming and execution of R&D

SNETP

Sustainable Nuclear Energy Technology Platform

Research & Technology Organisations

Industry

Academia

Non-governmental Organisations

Technical Safety Organisations

Others

Thank you for your attention

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Backup slides

Reminder: benefits of nuclear fission for Europe

Nuclear fission…

- Is a massive low-carbon energy source
- Ensures security of energy supply for Europe
- Has an excellent safety record in Europe
- Minimizes its waste with the new generations of nuclear plants
- Benefits from distributed and geopolitically stable uranium supply
- Offers operational availability above 90 %
- Provides economic energy for a competitive European industry and affordable electricity for consumers, independently from fossil fuel price volatility
- Is a sector where Europe has industrial leadership which needs to be maintained