

EURATOM Research & Training Programme

- **Where does it come from?**
- **How to participate?**



Euratom

Grzegorz WROCHNA

- **National Centre for Nuclear Research, Poland**
- **Expert of Euratom Programme Committee**
- **Chairman of Nuclear Cogeneration Industrial Initiative**
- **Coordinator of Euratom Gemini+ project**

Some slides adopted from

Mykola DŽUBINSKÝ

- **DG RTD/Directorate Energy/Unit G.4**



Euratom Treaty



Paris 1957
The Treaty establishing the European Coal and Steel Community (ECSC)

Rome 1957
Treaty establishing the European Economic Community (EEC)

Treaty establishing the European Atomic Energy Community (Euratom)



6 Member States

Maastricht 1992
Treaty on European Union
12 Member States

1997
Treaty of Amsterdam
15 Member States



2001
Treaty of Nice

2009
Lisbon Treaty
Euratom Treaty
27 Member States (now 29->28)

Legal basis

for nuclear fission:

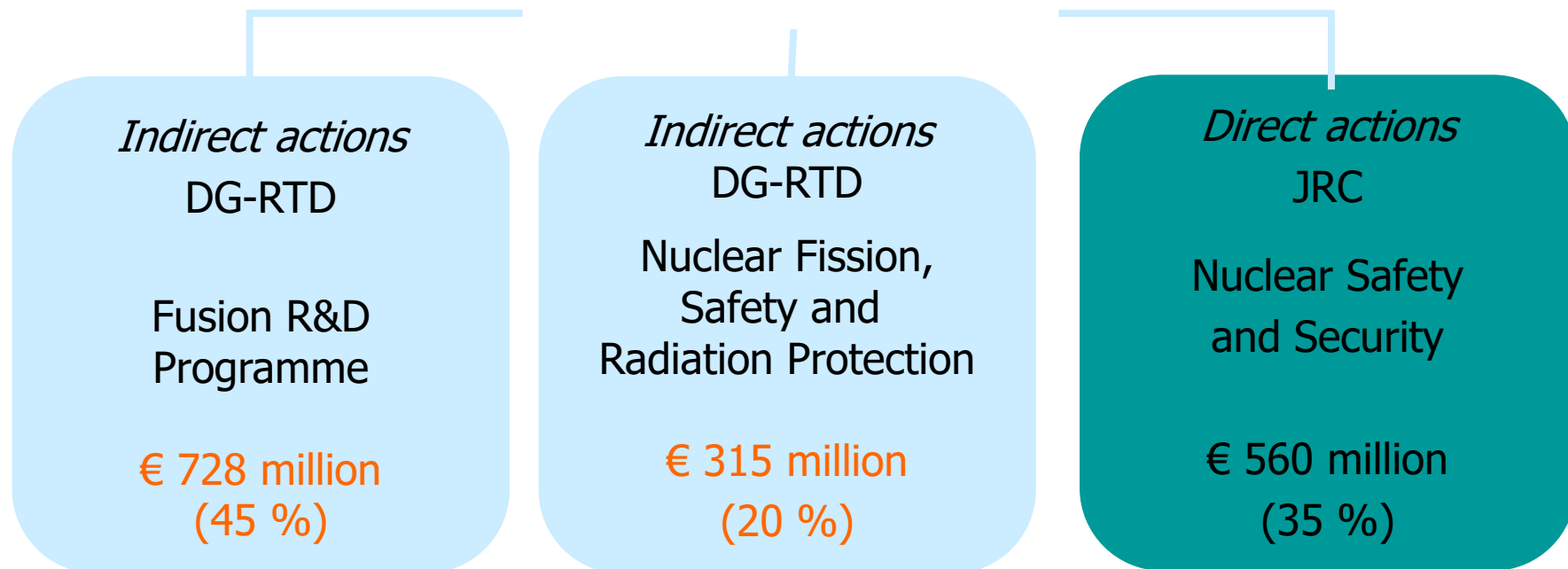
- *Agreement for Cooperation in the field of nuclear safety (2002)*
- *Agreement for Peaceful uses of nuclear energy (2006)*

for nuclear fusion:

- *Agreement for Cooperation in the field of controlled nuclear fusion (2002)*

Euratom Programme (2014-18) complementing H2020

→ Council Regulation of 16 December 2013

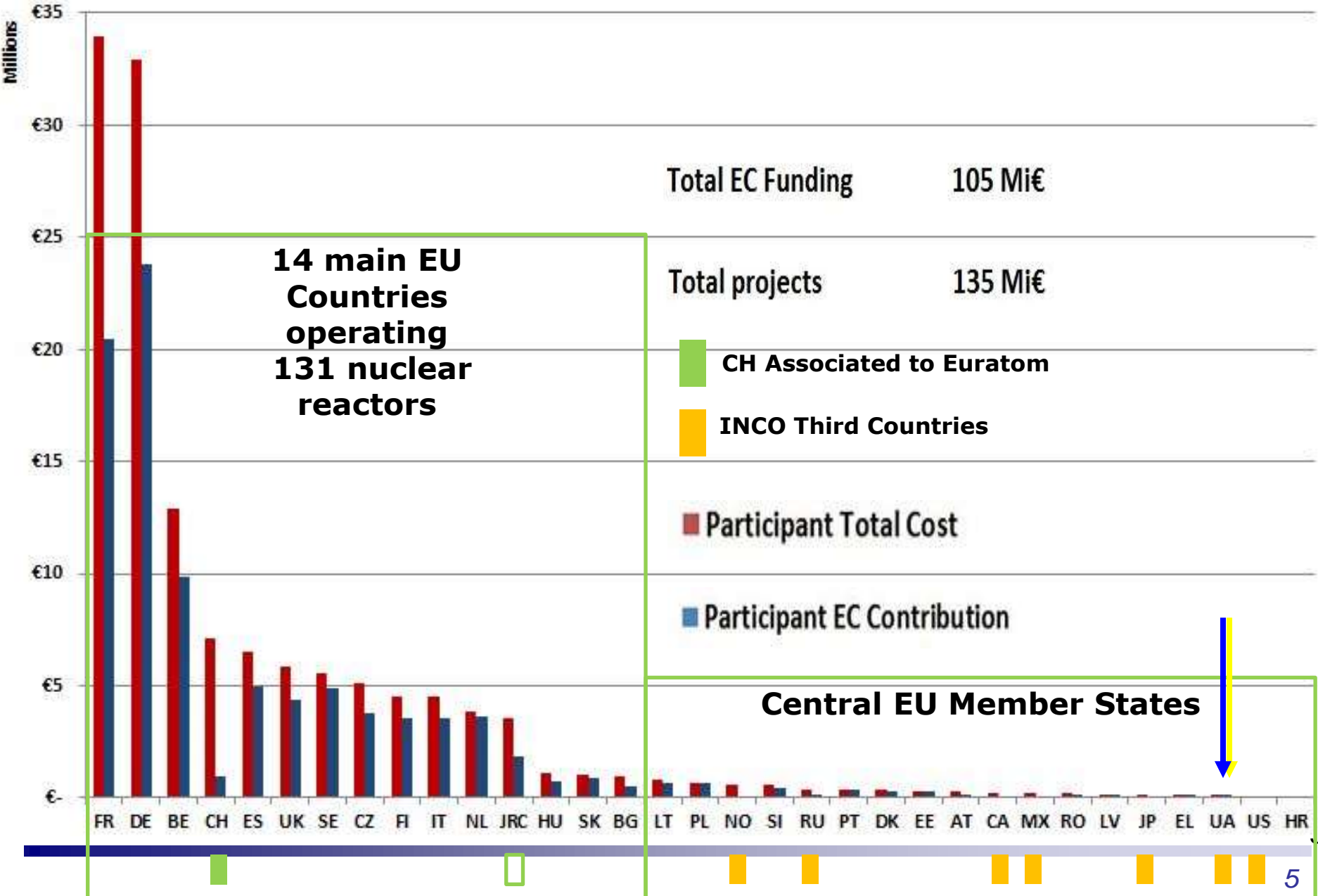


Total budget: € 1603 million

(outside H2020) → Council Decision of 13 December 2013

ITER (2014-2020) through JU-F4E: € 2915 million in current values

EURATOM H2020 Fission Call 2014-2015



Fission

- *High-level technical bilateral meetings in 2010 and 2012*
- *Coordination Committee set up in **November 2014***
- *Ukrainian entities participated in **11** Euratom fission **FP7&FP7+2** projects, with total budget of participation of **~1,5 mln €** and EC contribution of **~1 mln €***
- *Ukrainian entity is a partner in **H2020 ESSANUF** project, with budget & EC contribution **~130 k€***
- ***CC-2** on **18/5/2016** – "mapping" of priorities*



Nuclear Fission and Radiation Protection

- ***One EURATOM Work Programme for 2016-2017***
- ***One EURATOM fission call for 2016-2017***
- ***Single stage evaluation procedure: remote individual phase and consensus plus panel stage in Brussels – just finished***
- ***Combined indicative budget for Euratom Fission NFRP-2016-2017 call - ~105 M€***
- ***Work Programme 2018 under preparation***



Instruments

Research and innovation actions

- Basic and applied research, technology development, testing and validation, but limited demonstration or pilot activities
- *Funding rate: maximum 100%*

Coordination and support actions

- Networking, coordination or support services, policy dialogues, dissemination, awareness-raising, communication, studies, etc.
- *Funding rate: maximum 100%*



Reactor systems

- Safety & competitiveness of nuclear installation
- Advanced nuclear systems for increased sustainability
- Advanced systems for non-electrical uses

Radiation protection

Geological disposal

Research infrastructures

Training and mobility

Cross-cutting and International Cooperation (INCO)

Information is not legally binding

Where workprogrammes come from?

FP4,5,6 – bottom-up approach:

- EU funded projects proposed by scientists

FP7, H2020 – top-down approach

- Workprograms are created „on request” by:
 - **member states (ministries)**
 - Euratom Scientific & Technical Committee
 - Euratom Programme Committee
 - **technology and innovation platforms**
 - consortia of industry and research organisations
 - created in response to SET-Plan

SET-Plan and ETIPs

- **European Strategic Energy Technology Plan is the most important EU document on the future of energy sector**
- **It includes several energy technologies („actions”)**
 - **Action 10 = nuclear**
- **Each „action” is covered by corresponding European Technology & Innovation Platform**



What does SET-Plan say about nuclear?

SET-Plan to support the implementation of Energy Union

Key EU technology challenges to meet 2020 targets:

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

- Key EU technology challenges for the **next 10 years to meet 2050 objectives:**

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

- Priority initiatives launched from 2008 onwards (initially 6 in total):
 - **European Sustainable Nuclear Industrial Initiative (ESNII) in 2010 focusing on development of Generation-IV technologies**
- Establishing of the European Energy Research Alliance (EERA)
 - **Joint Programme on Nuclear Materials (JPNM)**



http://ec.europa.eu/energy/technology/set_plan/set_plan_en.htm

Fission indirect actions



Reactor systems

- Safety & competitiveness of nuclear installation
- Advanced nuclear systems for increased sustainability
- Advanced systems for non-electrical uses



Radiation protection



Geological disposal



Research infrastructures

Training and mobility



Cross-cutting and International Cooperation (INCO)

Information is not legally binding

SNETP

SUSTAINABLE NUCLEAR ENERGY
TECHNOLOGY PLATFORM

www.snetp.eu



Research & Technology Organisations



Industry



Technical Safety Organisations



Academia



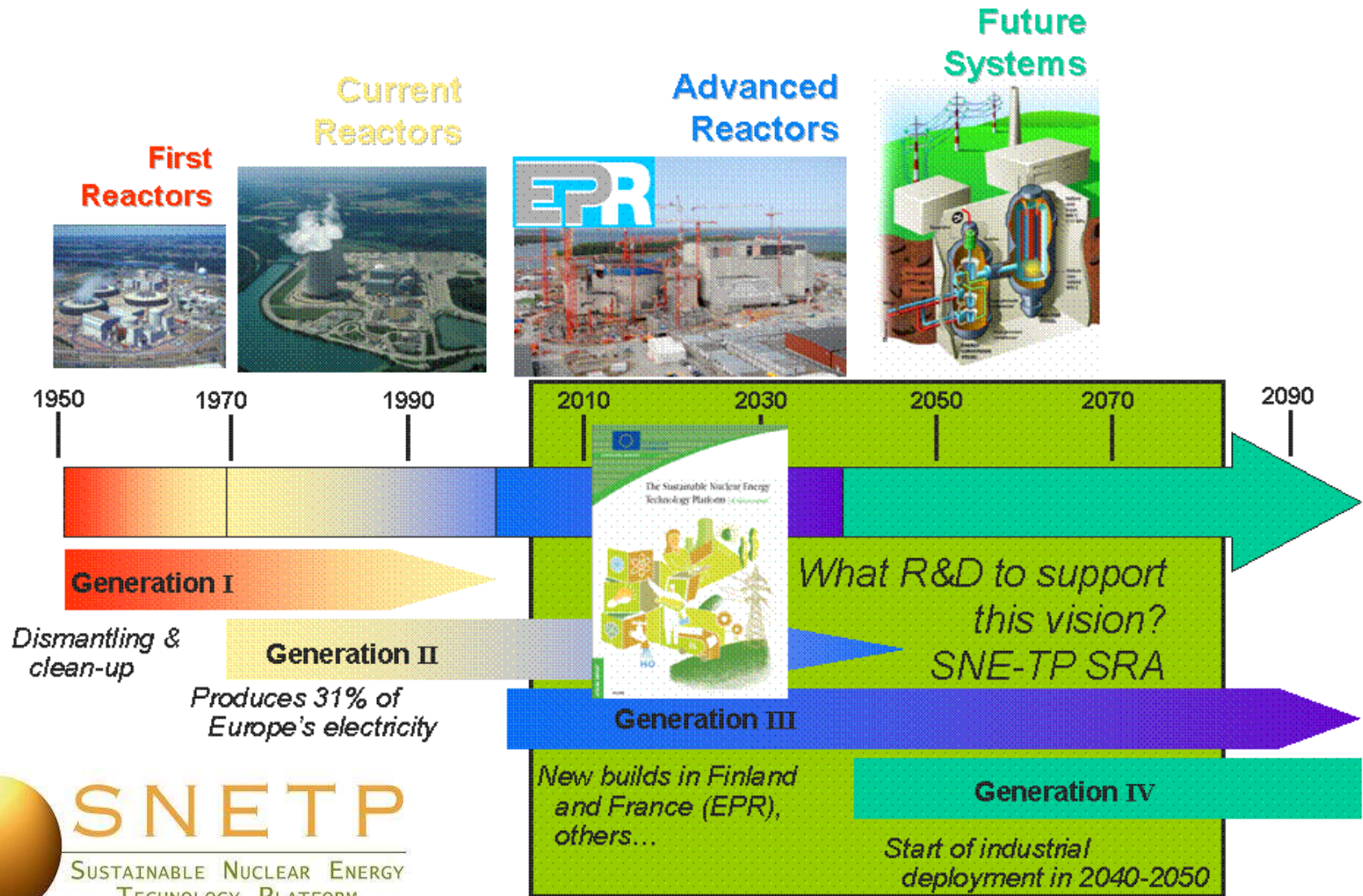
Non-governmental Organisations



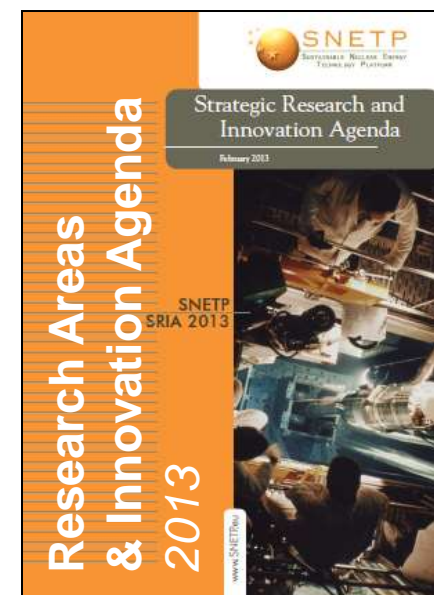
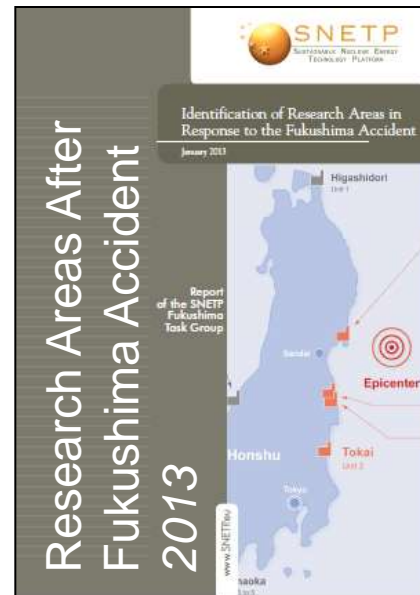
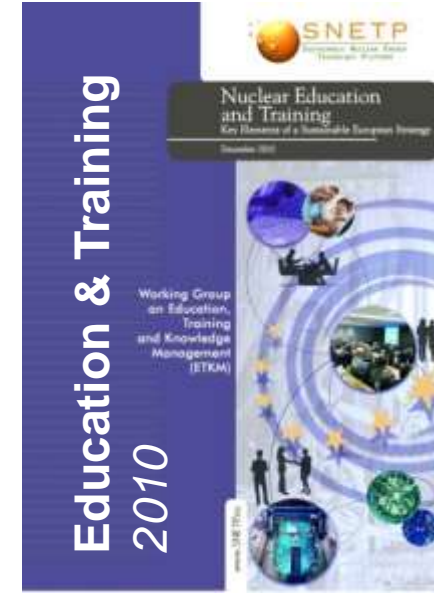
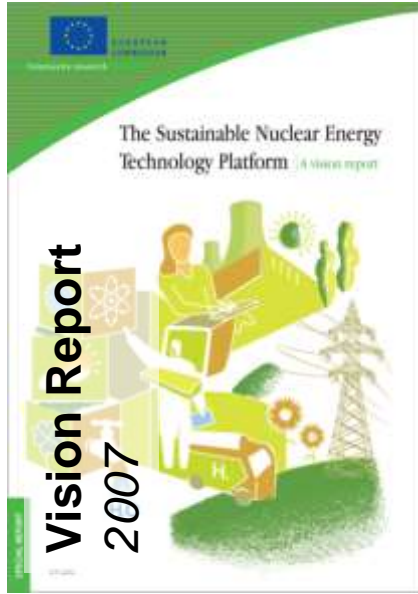
Others



Sustainable Nuclear Energy Technology Platform



SNETP strategic documents



SNETP

DESIGNS

NUGENIA

GEN II & III REACTORS

ESNII

FAST REACTORS

NC2I

**NUCLEAR
COGENERATION**

What is NUGENIA?



- 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



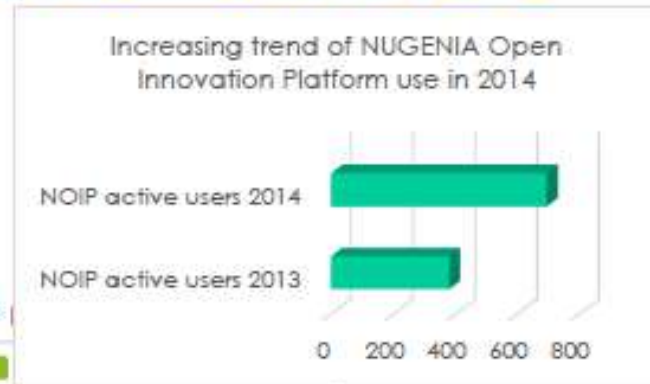
Technical Scope: 8 Technical Areas (TAs)

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

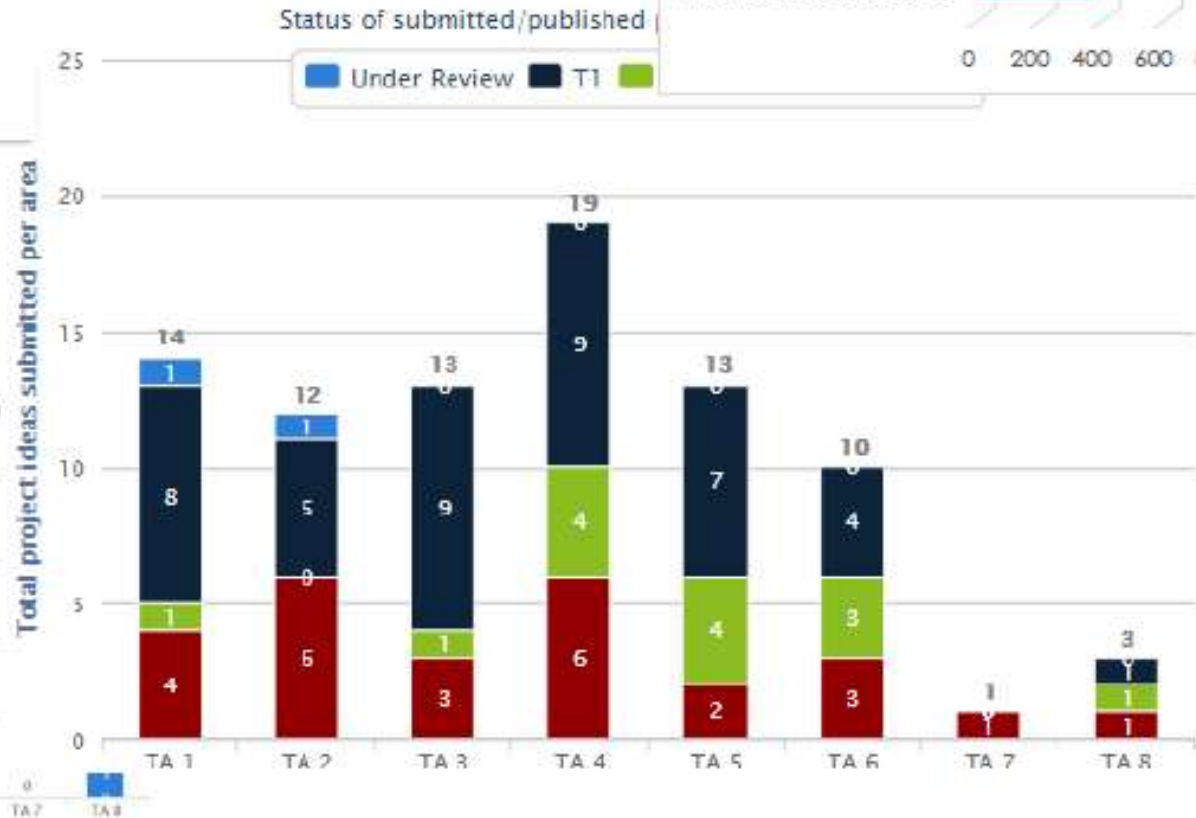
Many thanks to all TAL's and STAL's and their coordinator for the huge amount of work performed together on a voluntary basis to build a realistic and consensual R&D global vision

NUGENIA Project ideas

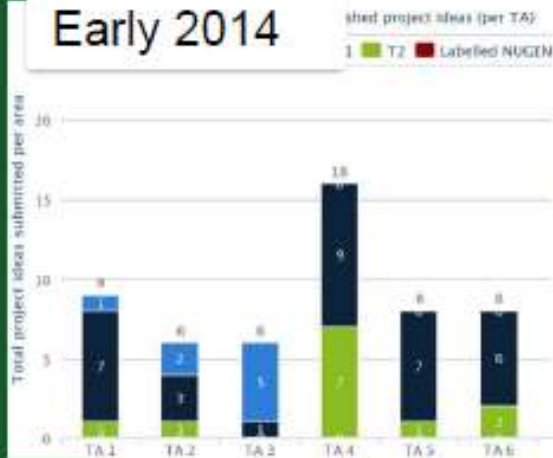
- NUGENIA Open Innovation Platform (NOIP) allowed identification of over 80 project ideas (more than 600 users)
- 26 project ideas labelled since May 2014



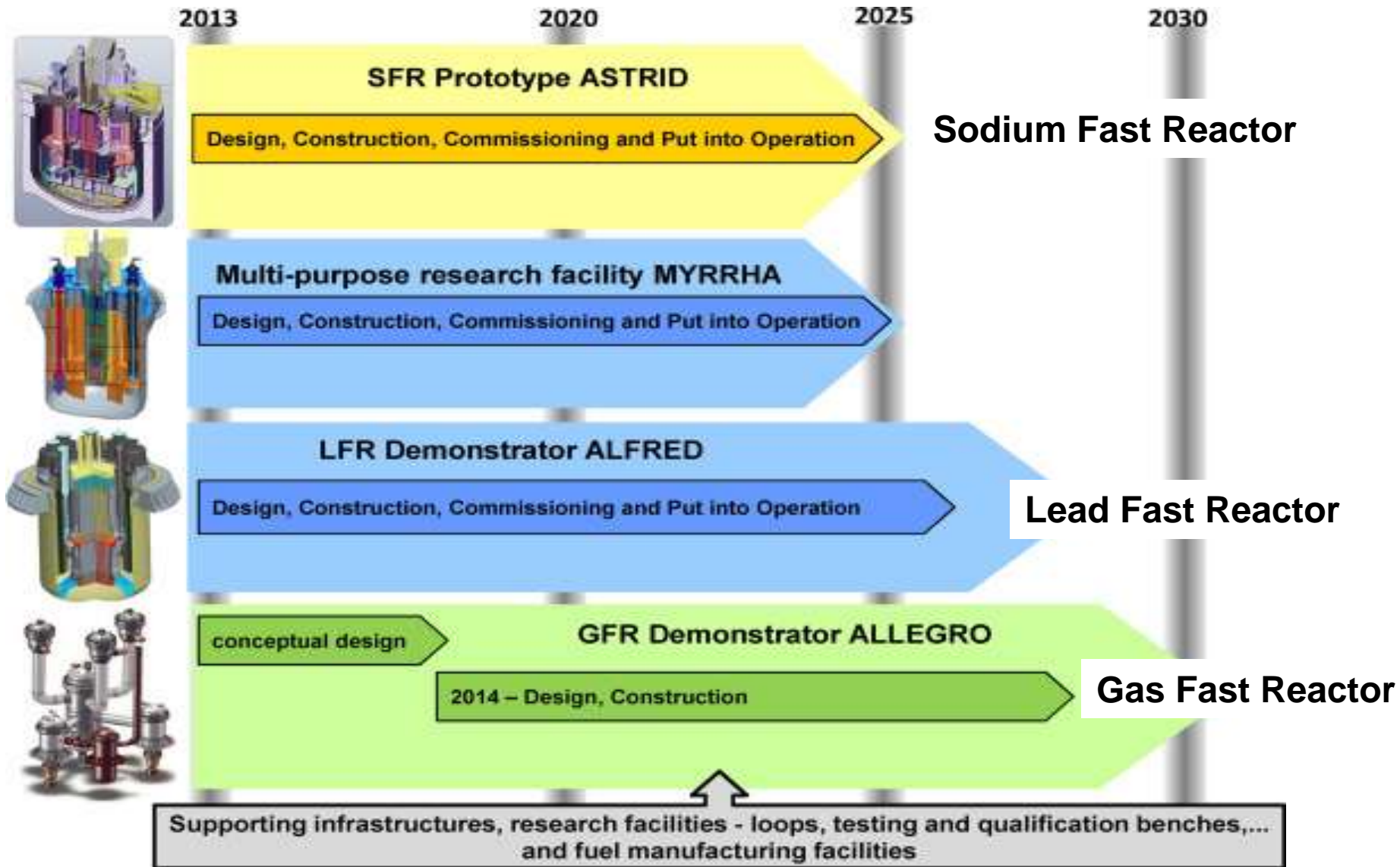
Early 2015



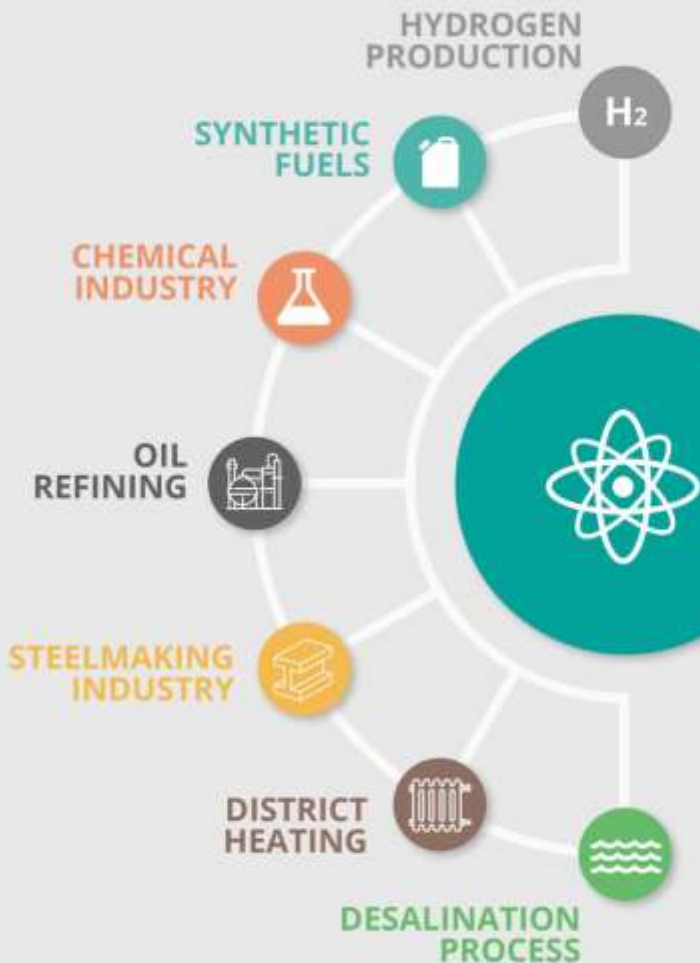
Early 2014



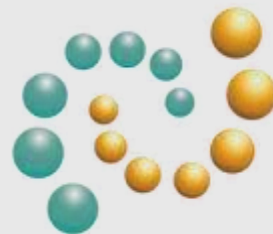
European Sustainable Nuclear Industrial Initiative



Nuclear Cogeneration Industrial Initiative



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



NCI 21
Nuclear Cogeneration Industrial Initiative

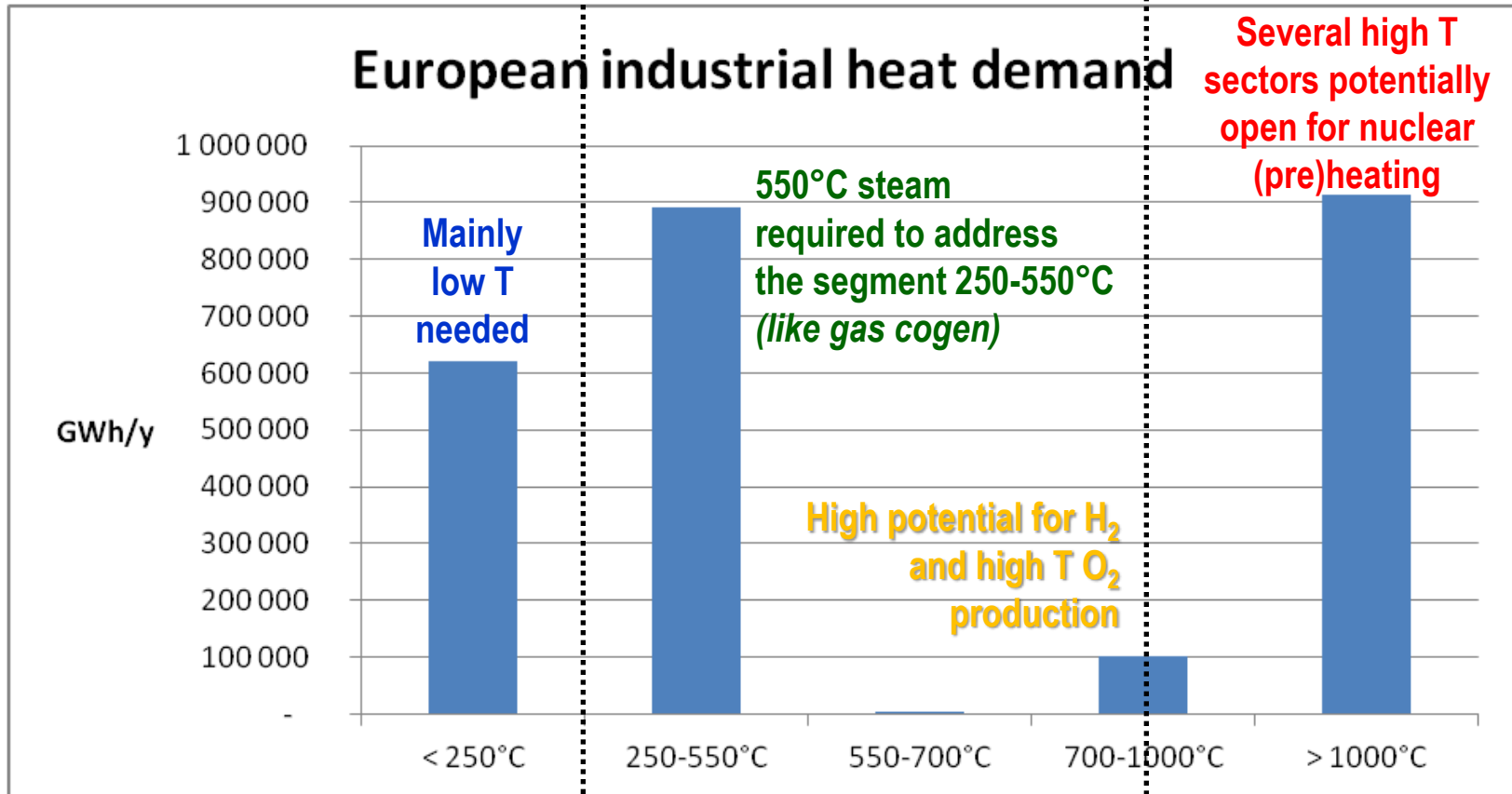
Industrial heat demand in EU

LWR, FBR
District heating, pulp & paper, desalination

HTGR

Chemicals, refining, H₂, steelmaking, soda ash, lime, glassmaking, industrial gases, etc.

VHTR



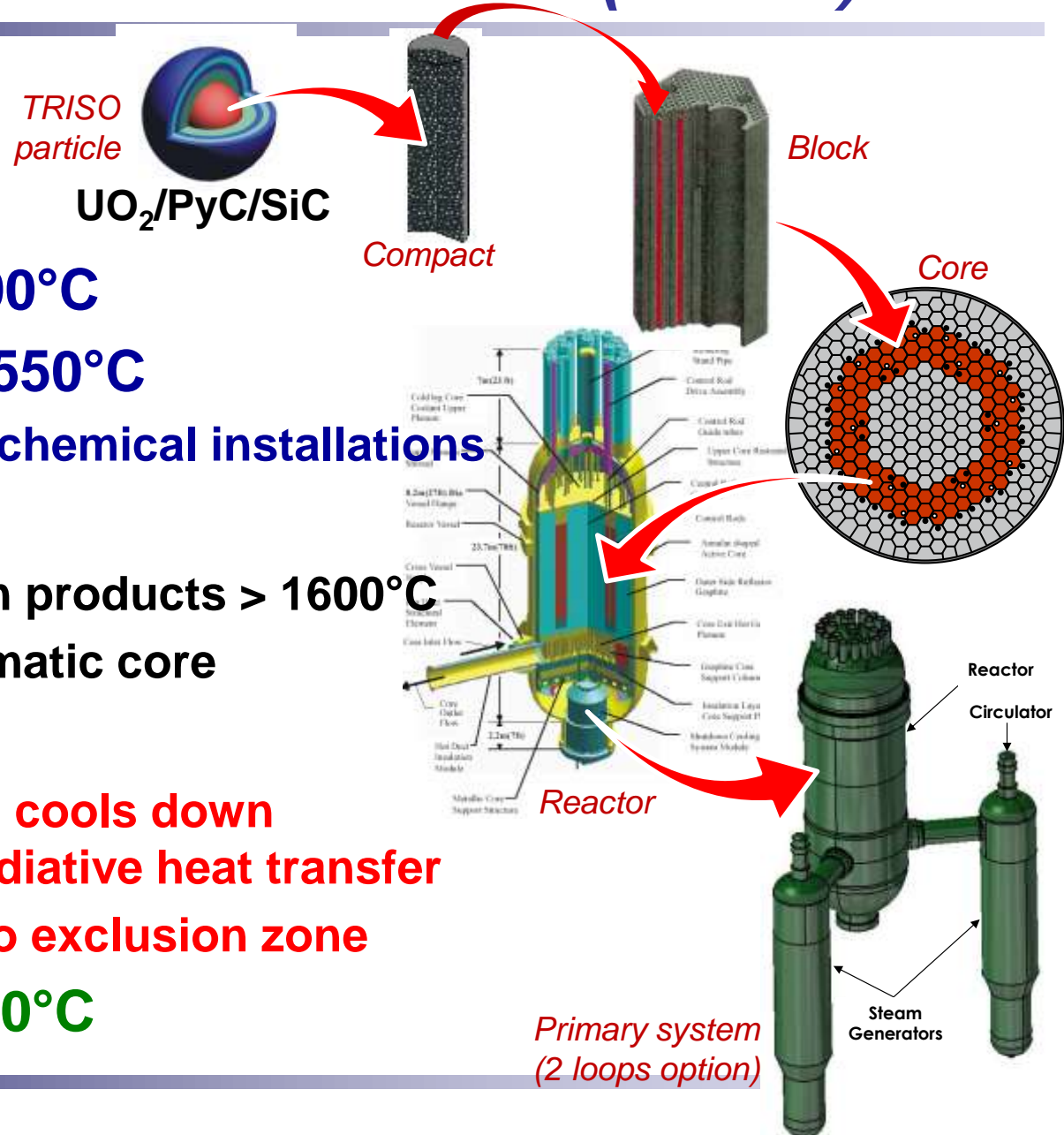
Reactors mature + experience in cogen

Proven reactor technology, high potential for cogen

Long-term

High T Gas-cooled Reactor (HTGR)

- **Coolant: Helium 700°C**
- **2nd circuit: steam 550°C**
 - typical for existing chemical installations
- **TRISO fuel**
 - Leak tight to fission products > 1600°C
 - Pebble-bed or prismatic core
- **Intrinsic safety**
 - In case of accident, cools down by conduction & radiative heat transfer
 - No core damage, no exclusion zone
- **Future: VHTR >1000°C**



Multidisciplinary European Low-Dose Initiative (MELODI)



- Multidisciplinary approach to resolving outstanding issues relating to risk from low and protracted exposure to ionising radiation: RP, (radio)biology, health physics, genomics, epidemiology, ...
- Main European RP research funding organisations
- 'Joint Programming Initiative' linking national and Euratom programmes → Strategic R&I Agenda
- Project DoReMi (Network of Excellence)
- Euratom calls for proposal increasingly oriented towards MELODI requirements





Implementing Geological Disposal of Radioactive Waste – Technology Platform

- Implementation-oriented R&D activities on all remaining key aspects of deep geological disposal of spent fuel and long-lived radioactive waste
- Demonstration on the technologies and safety
- Main European RW-GD research funding organisations
- Euratom calls for proposal largely oriented towards IGD-TP requirements



MINISTERUL ECONOMIEI
AGENȚIA NUCLEARĂ ȘI PENTRU DEȘEURI RADIOACTIVE



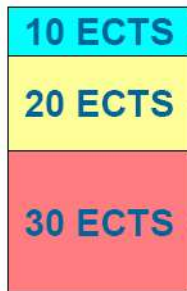


ENEN EDUCATION: "An agenda for new skills and jobs - A EU contribution towards full employment", COM(2010)682 => lifelong learning and cross-border mobility

- **Bologna Declaration on the "European Higher Education Area"**
(June 1999 – 47 signatory States)
=> "European Credit Transfer and accumulation System" /ECTS/
- **Copenhagen Declaration on "enhanced European cooperation in VET"**
(November 2002 – signed by all 28 EU Member States)
=> "European Credit system for Vocational Education and Training" /ECVET/

European System: 1 year = 60 ECTS

1 ECTS ~ 10 Hours



BOLOGNA 1999:
MUTUAL RECOGNITION OF ACADEMIC GRADES

COPENHAGEN 2002:
Lifelong learning and cross-border mobility

Information is not legally binding

When workprogramme is ready ...

- **Workprogramme contains <20 topics**
- **Typically 1-4 projects per topic are allowed**
- **Usually, large pan-european consortia are formed for each topic**
- **In practice, once workprogramme is announced, consortia are already formed**
- **To increase your chance join the consortium of your interest before the call**

Let us do it together!



Once we have done it!

European Consortium for the Development of Fusion Energy

[https://www.euro-fusion.org/ /](https://www.euro-fusion.org/)

Sustainable Nuclear Energy Technology Platform

<http://www.snetp.eu/>

NUGENIA association (Gen II&III)

<http://www.nugenia.org/>

Implementing Geological Disposal of Radioactive Waste Technology Platform

<http://www.igdtp.eu/>

Multidisciplinary European Low-Dose Initiative - MELODI

<http://www.melodi-online.eu/>

Strategic Energy Technology Plan

http://ec.europa.eu/energy/technology/set_plan/set_plan_en.htm

European Energy Research Alliance

<http://www.eera-set.eu/>

Information is not legally binding

EERA: Joint Programme on Nuclear Materials:

<http://www.eera-jpnm.eu/>

European Nuclear Education Network

<http://www.enen-assoc.org/>

Strategic Energy Technologies Information System

<https://setis.ec.europa.eu>

Strategic Energy Technologies Information System - European R&I landscape database

<https://setis.ec.europa.eu/set-plan-process/integrated-roadmap-and-action-plan/search-european-ri-landscape-database>

Participant Portal – H2020 Funding Opportunities

<https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/>

Participant Portal – H2020 Experts

<https://ec.europa.eu/research/participants/portal/desktop/en/experts/index.html/>