

SET Plan Report - Nuclear

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SET plan Conference, Nuclear Session

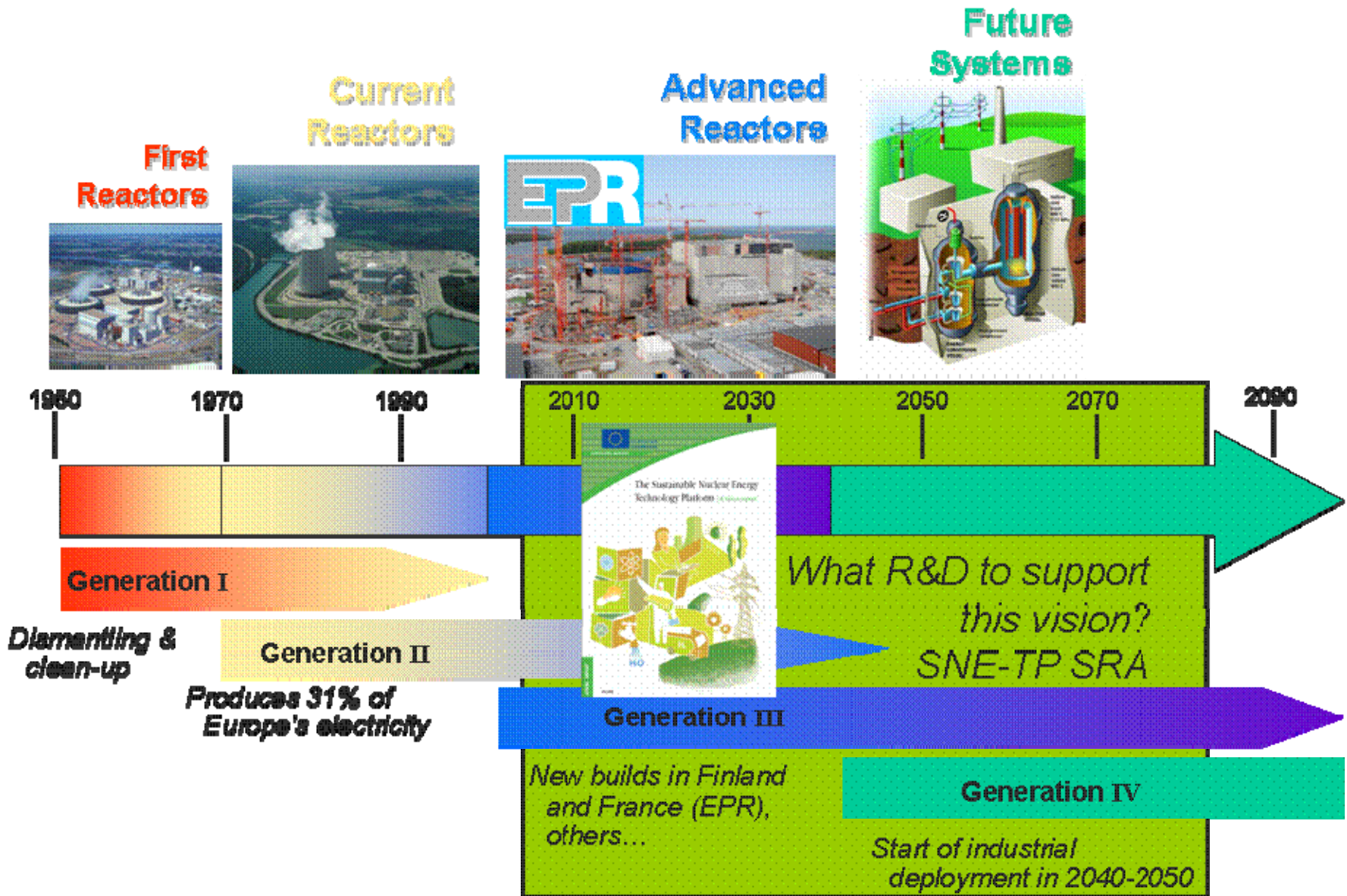
Stockholm, 21 October 2009

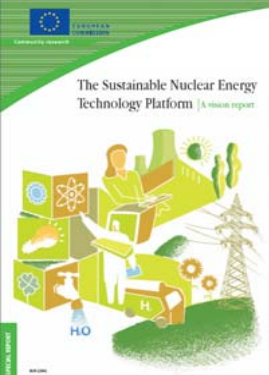
SET-Plan & nuclear fission



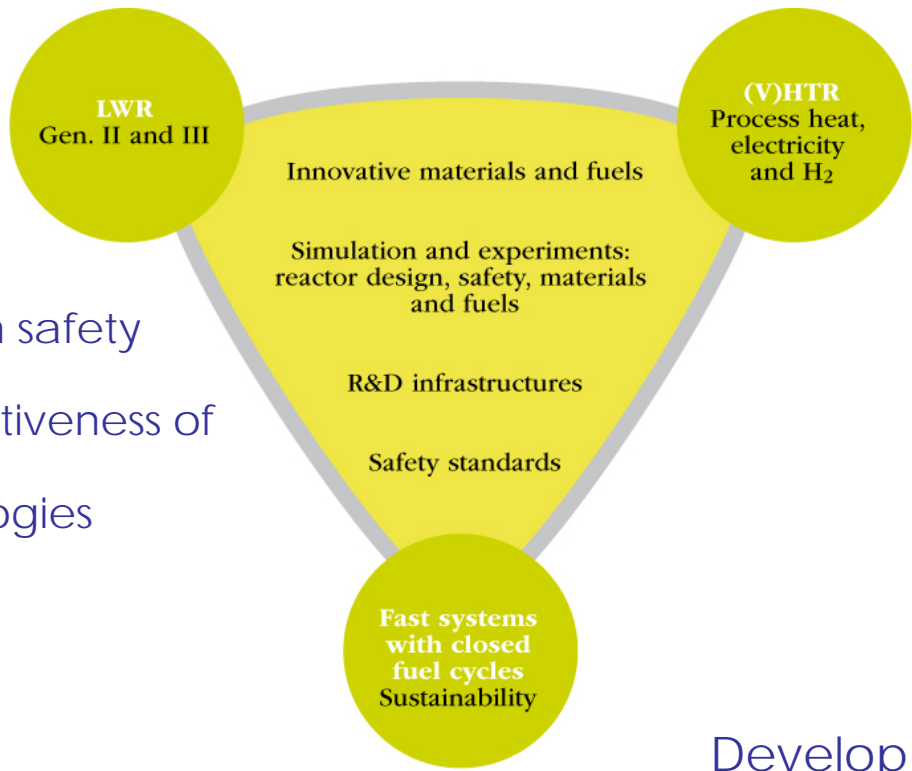
- **Key EU technology challenges** for the next 10 years
... to meet 2020 targets:
 - ***“Maintain competitiveness in fission technologies, together with long-term waste management solutions”***
- ... to meet 2050 vision:
 - ***“Complete the preparations for the demonstration of a new generation (Gen-IV) of fission reactors for increased sustainability”***
- **Priority European Industrial Initiatives to be launched from 2009 onwards:**
 - ***“Sustainable nuclear fission initiative: focus on the development of Generation-IV technologies”***

Sustainable Nuclear Energy Technology Platform





Technology platform – Three Pillars



Maintain safety and competitiveness of today's technologies

Enlarge the nuclear fission portfolio **beyond electricity production** (H₂, synthetic fuels, petrochemical/ steelmaking/ paper/ cement industries, seawater desalination, etc.)

Develop advanced reactors with **closed cycle** to enhance sustainability

« ESNII »

ESNII = European Sustainable Nuclear Industry Initiative

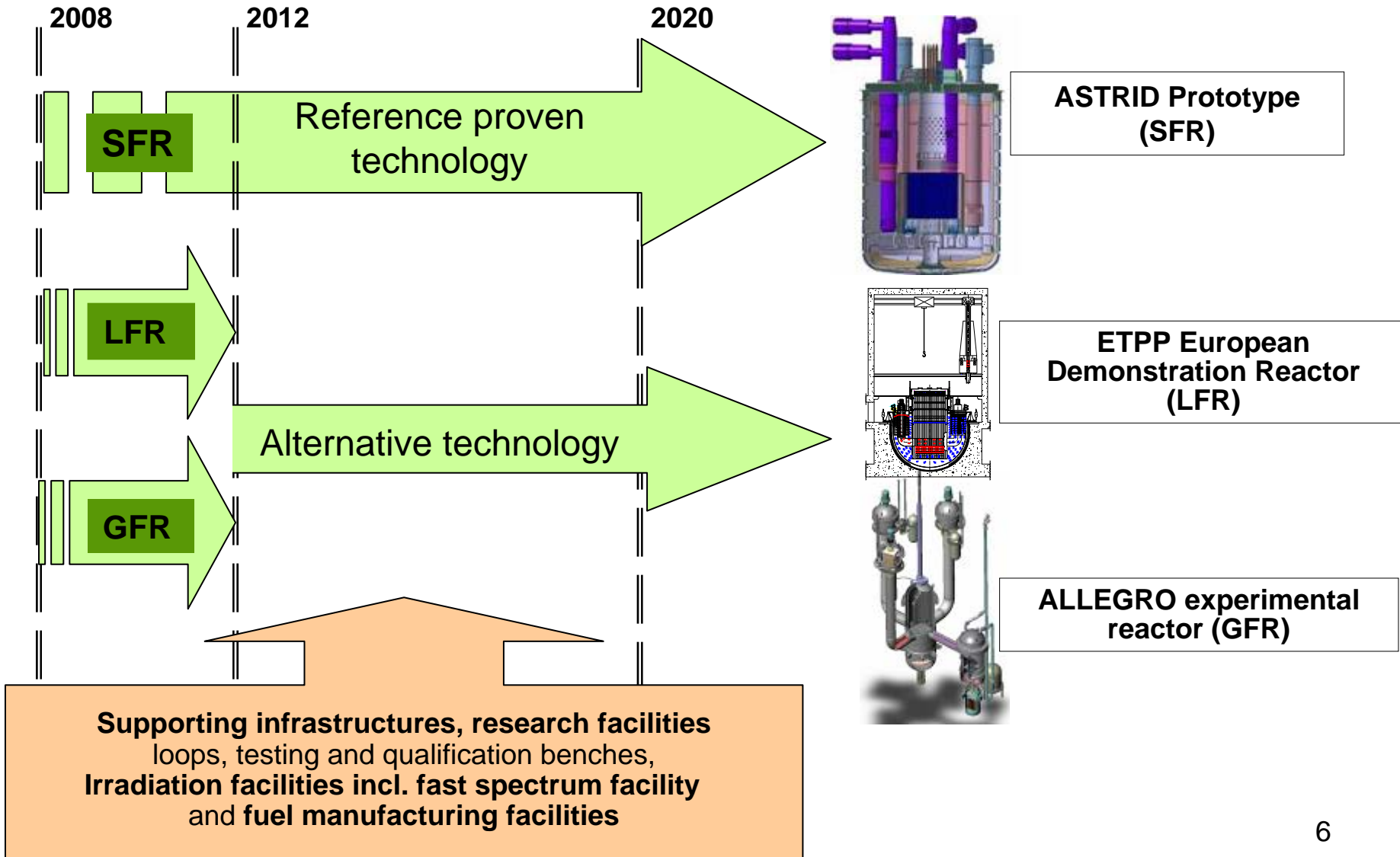
Aim of Gen IV advanced reactor systems, is enhanced:

- Resource utilisation
- Economics (Capital & Operating Costs)
- Safety features
- Waste minimised and “environmental footprint”
- Security, safeguarding and proliferation resistance

Technologies to be considered as part of ESNII

- Sodium Cooled Fast Reactor (SFR) – reference, preferred system
- Lead Cooled Fast Reactor (LFR)
- Gas-cooled Fast Reactor (GFR)

Euro. Sustainable Nuclear Industry Initiative - Roadmap



ESNII – European Sustainable Nuclear Industrial Initiative



Opportunities

1. Development of sustainable advanced reactor systems to meet SET plan objectives
2. Ensure EU capitalises on existing expertise in these technologies, can retain its leadership status and remain internationally competitive
3. Leverage of international cooperation
4. Ensure EU retains understanding of deployment of advanced reactor systems

Risks

1. Licensability – requirement to ensure regulators are integrated and engaged with development projects
2. Competitiveness – Need to focus on prototype system to assess technical, industrial and economical feasibility



1. Sustainable Nuclear Energy Technology Platform has been established with 3 pillars (Gen II/III systems, co-generation and advanced Gen IV reactors)
2. The Euro. Sustainable Nuclear Industry Initiative is specifically aimed at Advanced Reactor Systems that meet long-term goals of the SET plan.
3. Although adv. systems will not be available commercially until 2040 timeframe, work needs to commence now on prototypes
4. This will require innovative public-private partnerships. Further work on ESNII is require to define financing mechanisms, legal aspects, IP and the integration of research at the EU level
5. For ESNII to be effective it is essential stakeholders are engaged such as the regulators regarding licensability, utilities regarding end-user requirements.
6. Public acceptance is an integral part of successful implementation of ESNII. Enhanced efforts in this aspect should be