



The Sustainable Nuclear Energy Technology Platform (SNE-TP)

building the European Research Area in nuclear fission

A European Industrial Initiative for Sustainable Fission (SET Plan),

Prepared by SNE-TP EII Task Force



Strategic Energy Technology (SET) Plan & nuclear fission



- Communication from Commission (Nov 2007), endorsed by Energy Council in February 2008
- 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;
- Key EU technology challenges for the next 10 years to meet 2050 vision:
 - Complete the preparations for the demonstration of a new generation (Gen-IV) of fission reactors for increased sustainability;
- Priority initiatives (*European Industrial Initiatives*) to be launched from 2008 onwards:
 - *Sustainable nuclear fission initiative*: focus on the development of Generation-IV technologies.
 - **SNE-TP to propose a EII on GEN IV Fast Neutron Systems (SFR + more innovative technologies – GFR/LFR)**



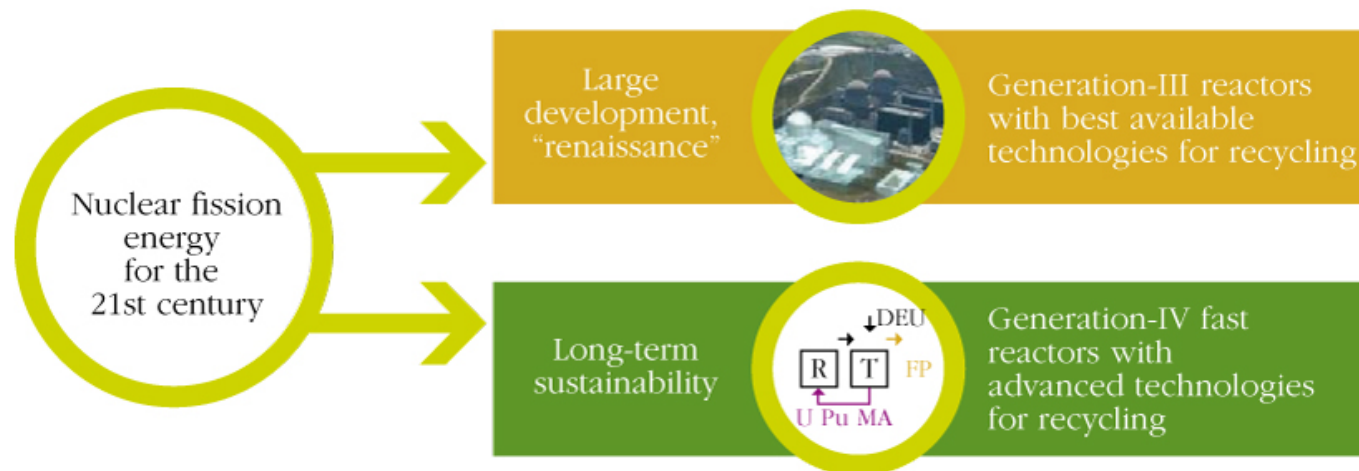
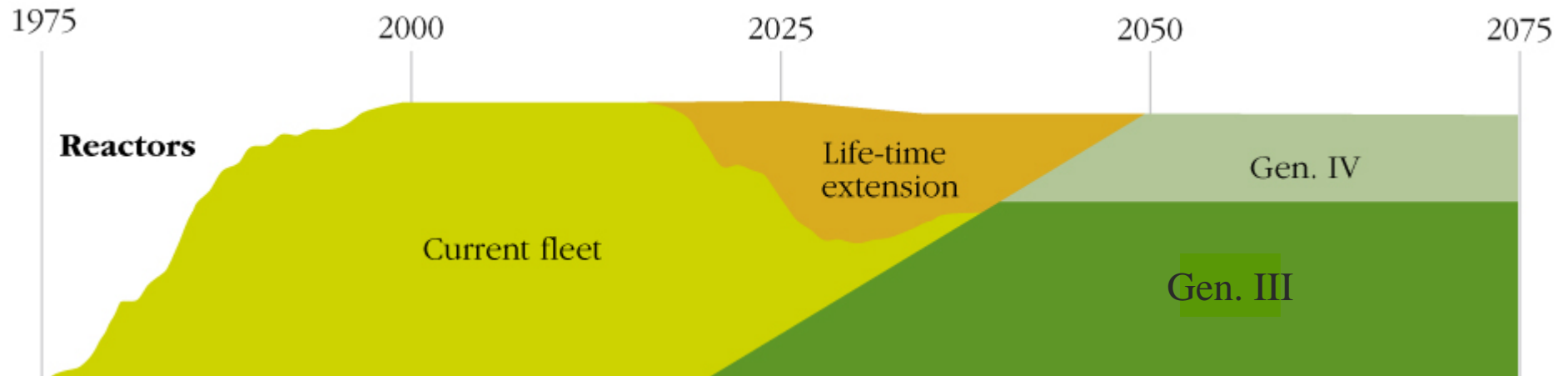
SET Plan & nuclear fission



- Priority initiatives to be launched from 2008 onwards:
 - ***Sustainable nuclear fission initiative: focus on the development of Generation-IV technologies.***
- Purpose of European Industrial Initiatives for SET Plan:
 - ***To strengthen R&D effort and to focus them to a timely achieved major breakthrough.***
 - ***To demonstrate the sustainability of nuclear energy by proving the technological, industrial and economical viability of fast neutron reactors***



Vision on Sustainable Nuclear Energy



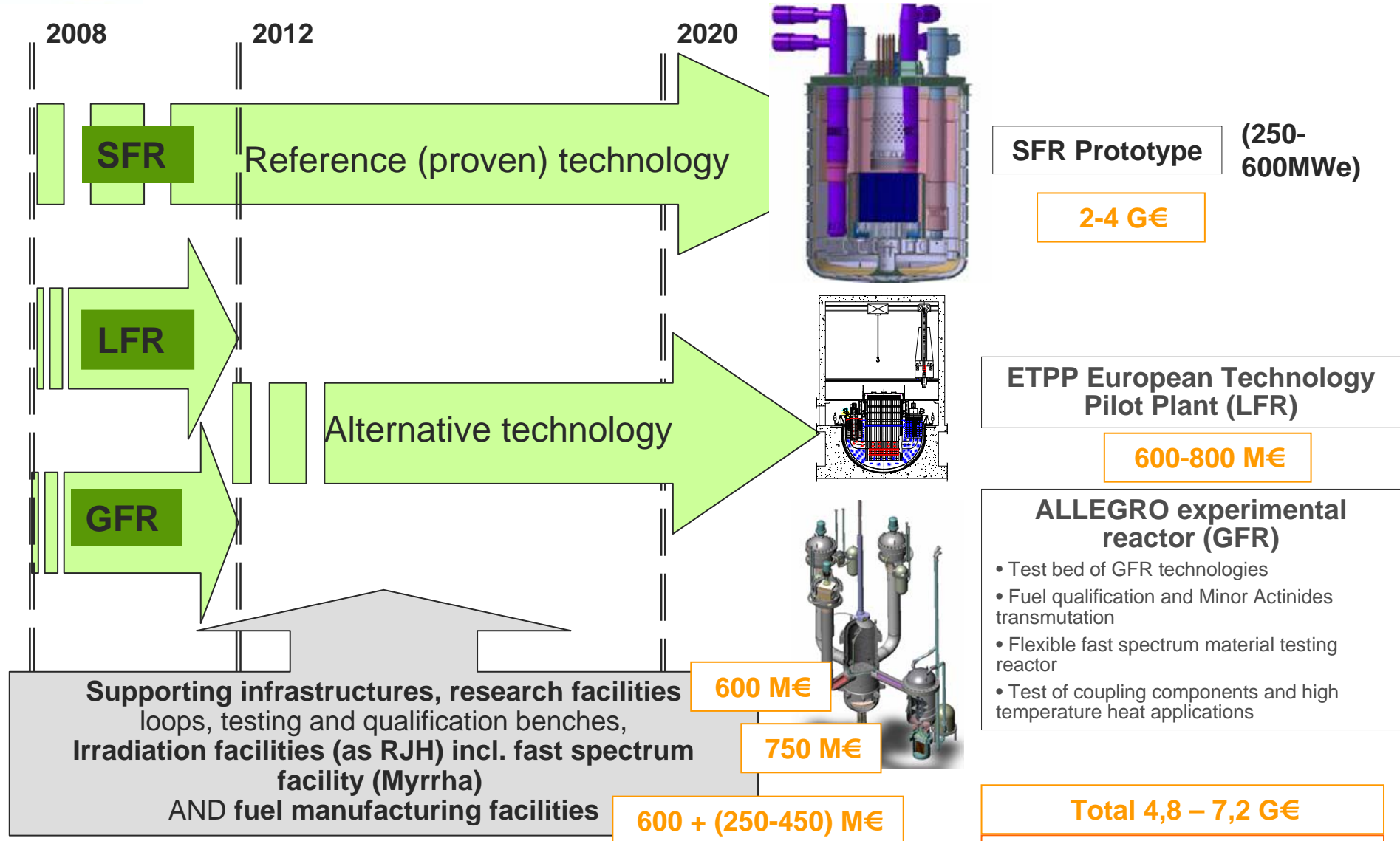


Sustainable Fission EII: deployment of SNE-TP Strategic Research Agenda

- Main Element of the Initiative:
 - **SFR technology** development with decision milestone in 2012 on a 250- 600 MWe prototype to be built in France (objective 2020-2025);
 - Selection between 2010 and 2012 of an **alternative technology** to SFR and decision for a 50-100 MWth technology demonstrator (**LFR or GFR**) (objective 2018-2020);
 - Development of closed **fuel cycle technologies** with decision around 2012 on the construction of fuel manufacturing facility and minor actinide bearing fuel;
 - **Irradiation facilities** with JHR (already funded ESFRI project, construction on-going, outside scope of EII) and a fast neutron multipurpose irradiation complementary facility ;
 - Specific testing and qualification **experimental facilities** for components design, system development and codes validation.
- Global cost of the initiative over the next 15 years is between 6 and 10 G€ (excluding JHR cost).



EII: demonstrate industrial feasibility of Gen. IV FNR technologies (demonstrators)





European Industrial Initiative: next steps (1/3)

- Budget and financing shall be addressed more accurately through a ~6-month consultancy-study (to be launched in January 09 – under Euratom FP procurement)
 - Private/public partnership;
 - EURATOM Treaty: FP Budget, loans;
 - Structural funds;
 - EIB loans;
 - Proposals from the Commission's future communication on "Financing of the SET Plan" (expected 1st quarter 2009).
- Consultancy study will also address the issue of legal structures to handle the operational management of the Initiative:
 - Review legal models: Joint Undertaking, European Economic Interest Grouping, European Research Infrastructure, ...);
 - Recommend the most appropriate for each component of the EII.



European Industrial Initiative: next steps (2/3)

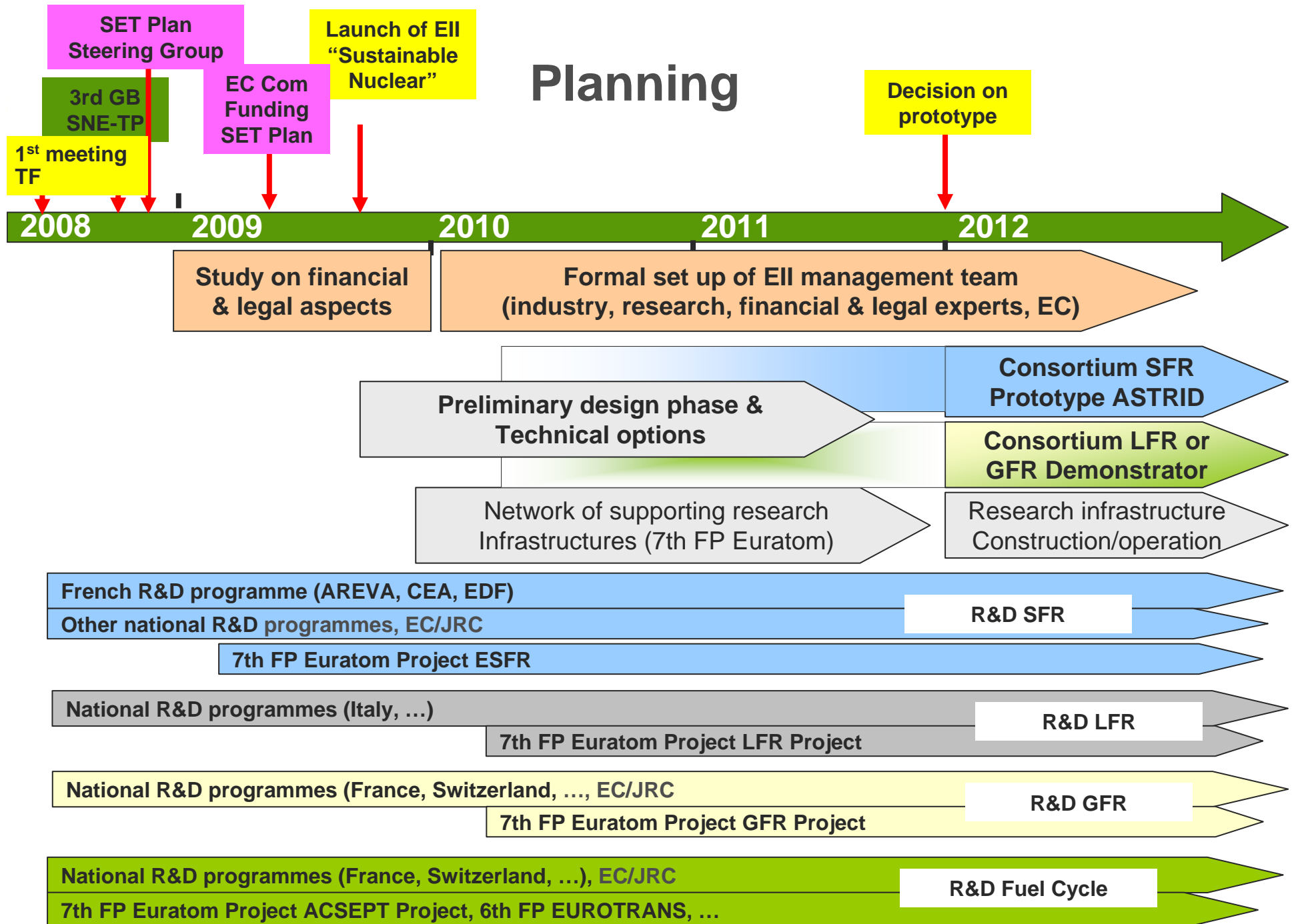
- Set-up a Network of Supporting Research Infrastructures, to promote necessary joint R&D, increase integration of European teams.
 - Experimental loops: eg. sodium, lead or gas loops, to provide data for the qualification of models and simulation tools
 - Irradiation facilities: with the development of joint experimental devices and instrumentation
 - Fuel fabrication, characterization, post-irradiation examination facilities
 - To be set up under the Euratom FP 2009 Work Program, 2 year duration
- Possible contributors:
 - UJV (as coordinator), CEA, SCK, FZK, AEKI, PSI, JRC...



European Industrial Initiative: next steps (3/3)

- Launch in second half of 2009
 - Switch from Task Force to “EII Management Team” consisting of:
 - Industry (industry (technology providers, utilities), research, legal and financial experts, as well as Commission
 - Consolidation of road-maps for prototype/demonstrator design and construction
 - Consolidation of budget planning
 - Intellectual/Industrial property issues
 - International cooperation (eg. GIF)
 - Interface with the SET Plan Governance Structure
- Technical progress expected in 2009:
 - Euratom FP projects: ESFR, “GFR” and “LFR” proposals
 - Examples of specific technical topics:
 - 2009: discussion on power range for SFR prototype (500 MWe?)
 - End of 2009: a first pre-conceptual design of GFR demo.
 - LFR?

Planning





Contribution of “Sustainable nuclear” EII to Lisbon Agenda, ERA and SET Plan objectives

- *Which host country for which technology demonstrators? **Regional developments***
- *Technological, industrial, economical impacts*
- *What **competitive advantage** for which **European industry**? *International competition**
- *Intellectual – Industrial Property Issues*

- *Research infrastructure network, Knowledge development aspects: **European Research Area***

- *Development of a **competitive, low carbon and sustainable energy technology**, providing base-load electricity, possibly means to produce alternative fuels to fossil – and with guaranteed security of energy supply*



LISBON

ERA

