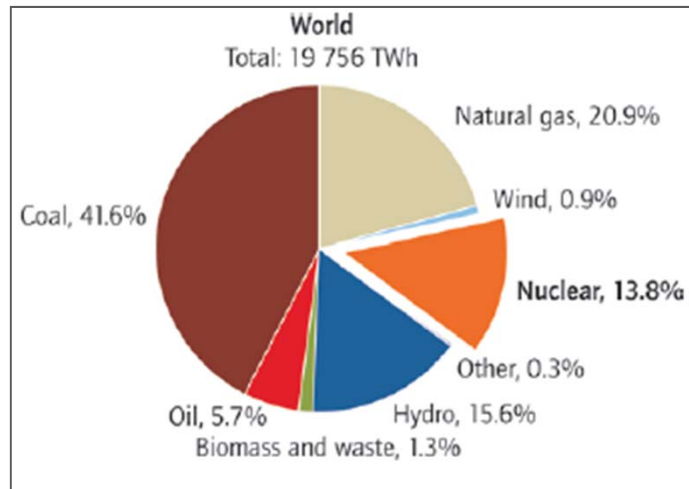


European P&T Strategy

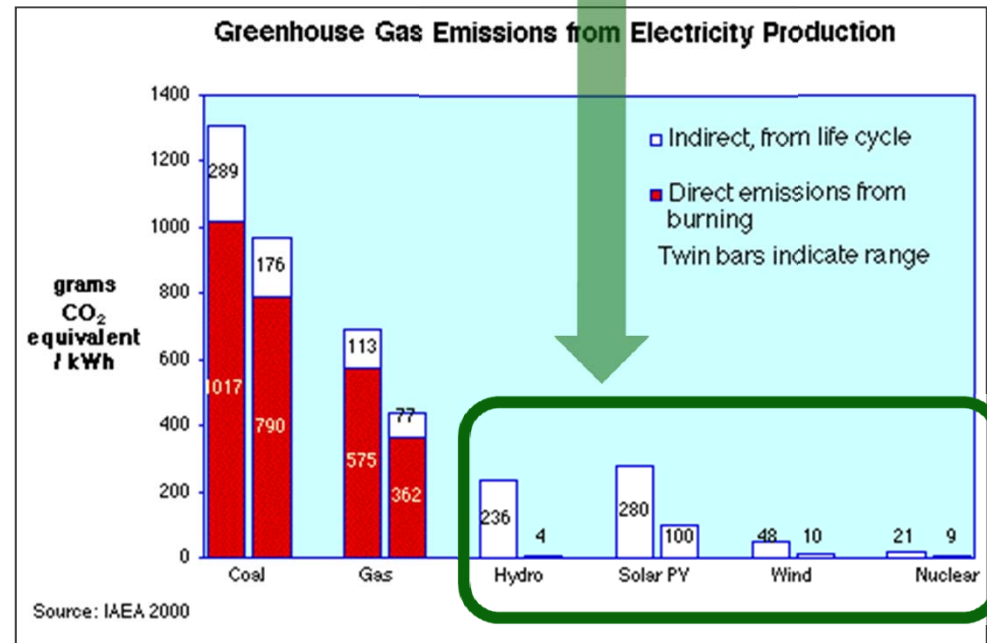
Belgian Contribution to ADS Transmutation

MYRRHA Project Status

P. D'hondt, Hamid Aït Abderrahim
SCK•CEN, Boeretang 200, 2400 Mol, Belgium
haitabde@sckcen.be or myrrha@sckcen.be



Electricity generation worldwide
(OECD, 2007)



Global issues for nuclear energy



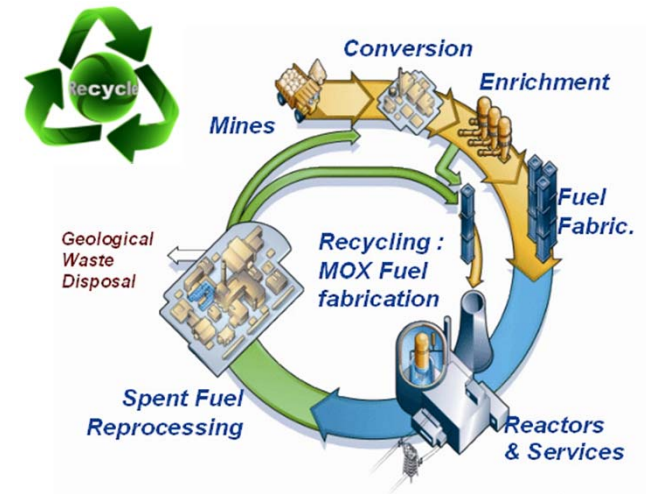
Common needs

Burning legacy of the past

Reducing cost of ultimate waste

Better use of resources

Enhance Safety

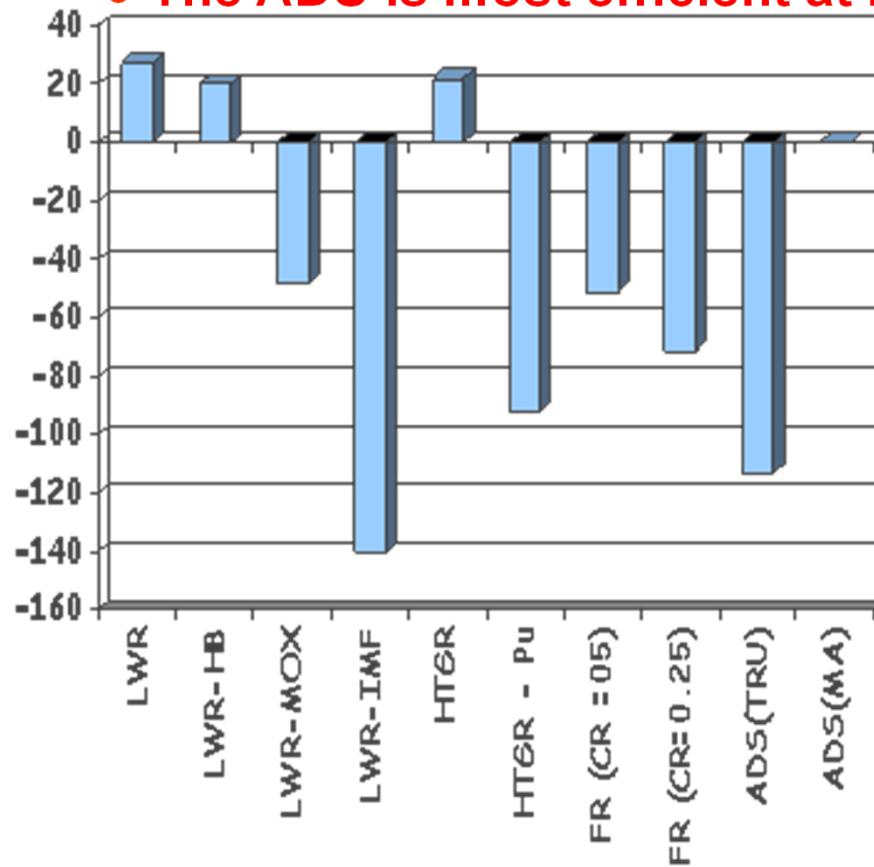


- **The implementation of P&T of a large part of the high-level nuclear wastes in Europe needs the demonstration of its feasibility at an “engineering” level. The respective R&D activities could be arranged in four “building blocks”:**
 1. **Demonstration of the capability to process a sizable amount of spent fuel from commercial LWRs in order to separate plutonium (Pu), uranium (U) and minor actinides (MA),**
 2. **Demonstration of the capability to fabricate at a semi-industrial level the dedicated fuel needed to load in a dedicated transmuter,**
 3. **Design and construction of one or more dedicated transmuters,**
 4. **Provision of a specific installation for processing of the dedicated fuel unloaded from the transmuter, which can be of a different type than the one used to process the original spent fuel unloaded from the commercial power plants, together with the fabrication of new dedicated fuel.**

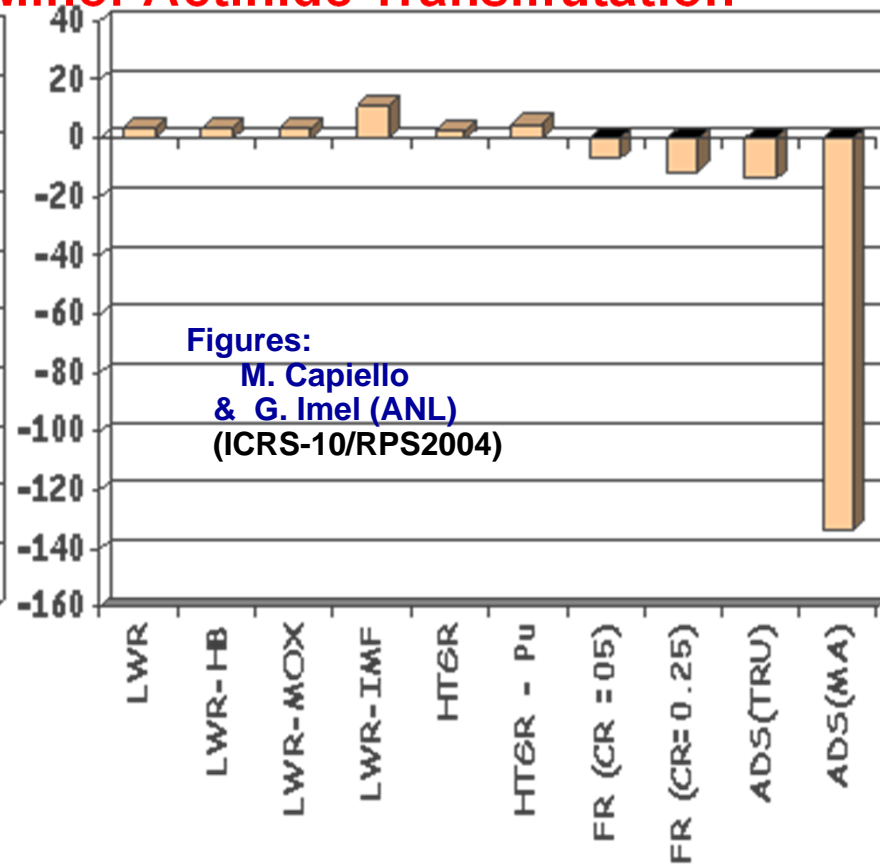
- In the frame of the Waste Management research programme of the EC since FP5 till FP7, various projects (ADOPT, PATEROS, IP-EUROTRANS, ARCAS) have studied various options of the fuel cycle and showed the need to consider the progress of ADS R&D and demonstration to allow future decisions considering:
 - Efficient burning of the LWR MA stockpile legacy
 - Considering the double-strata closed fuel cycle
 - Minimise the MA quantities in the electricity production park (even in the future FR park)
 - Allow regional approach for accommodating various national policies related to nuclear energy

ADS: Efficient Transmutation of MA

- The ADS is most efficient at Minor Actinide Transmutation



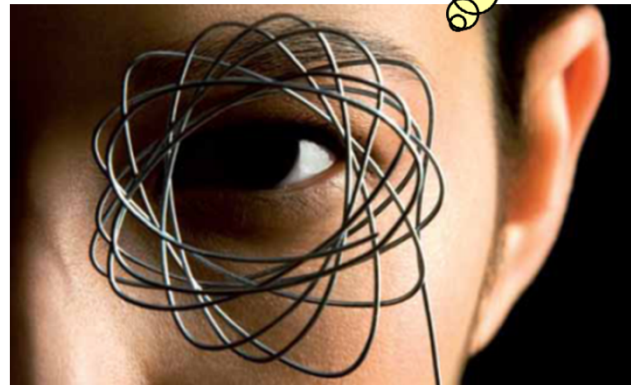
Pu Production Rate (grams / GWh)



MA Production Rate (grams / GWh)

Figures:
M. Capiello
& G. Imel (ANL)
(ICRS-10/RPS2004)

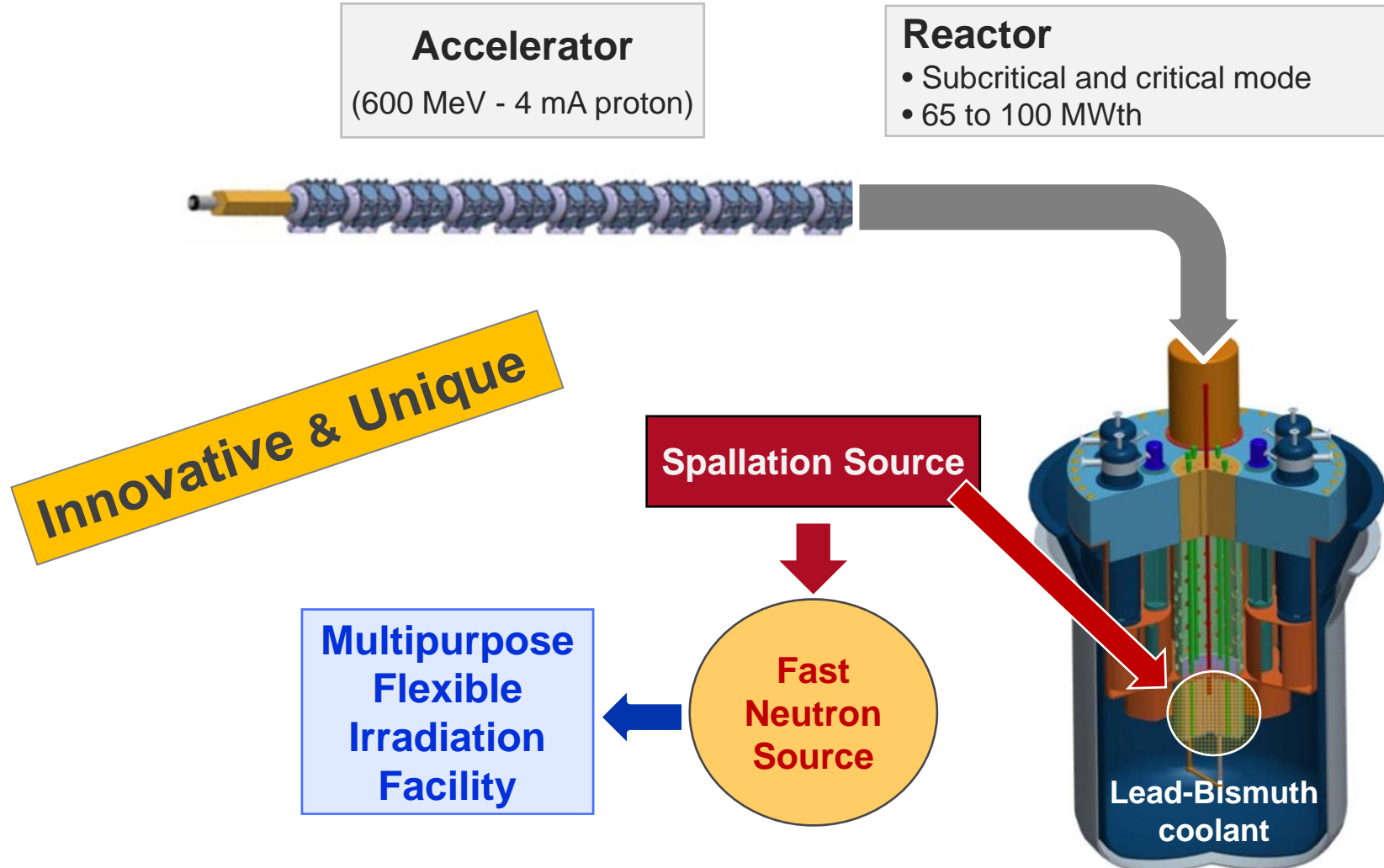
MYRRHA: an attractive research infrastructure



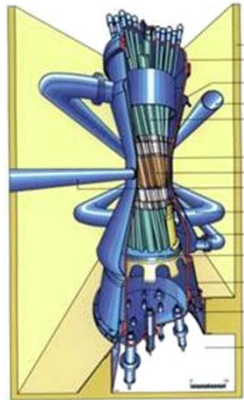
European Research Area



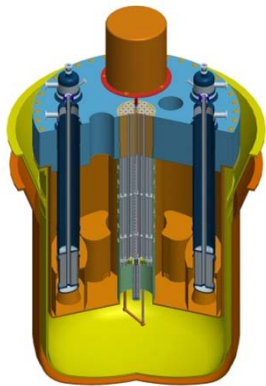
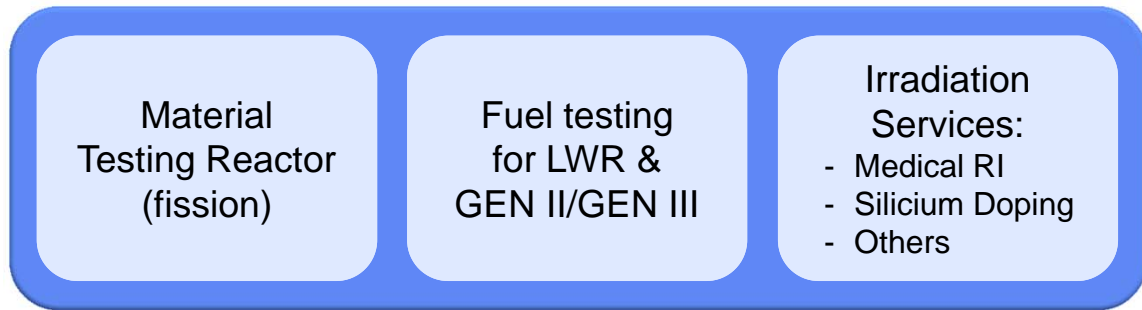
MYRRHA: the Belgian contribution to the P&T European strategy



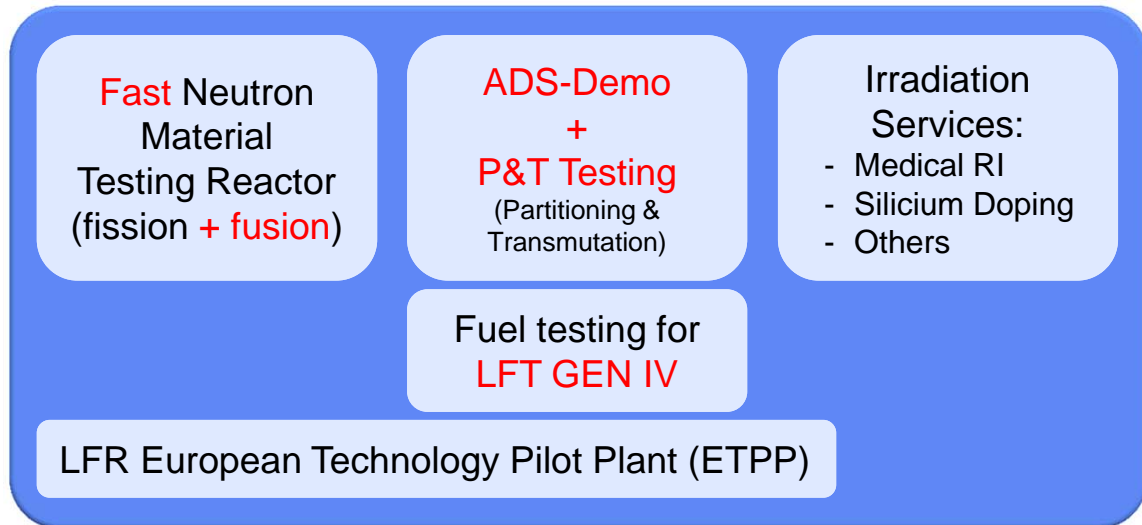
MYRRHA: a Multipurpose Irradiation Facility



1962
BR2



2023
MYRRHA



Europe and future nuclear energy

ESFRI
 European
 Strategic
 Forum for
 Research
 Infrastructure

SET Plan
 European
 Strategic
 Energy
 Plan

Knowledge Economy

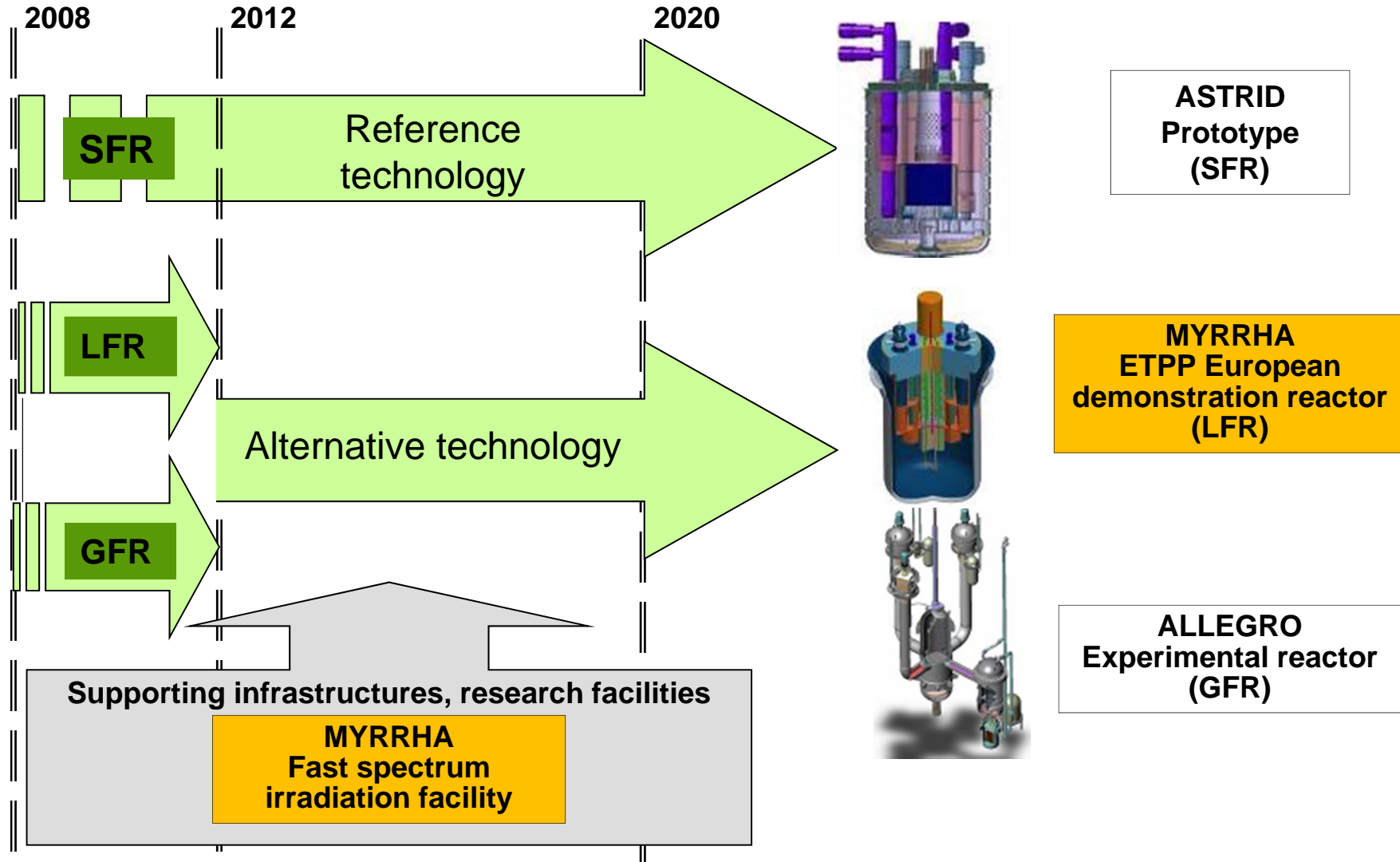



Energy Independence



MYRRHA part of ESNII

European Sustainable Nuclear Industrial Initiative







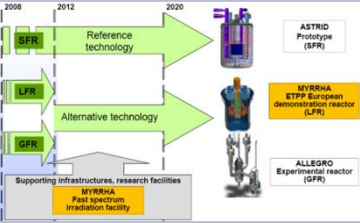
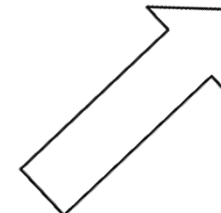
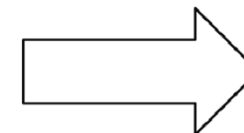
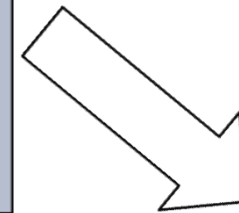
40 % financing commitment



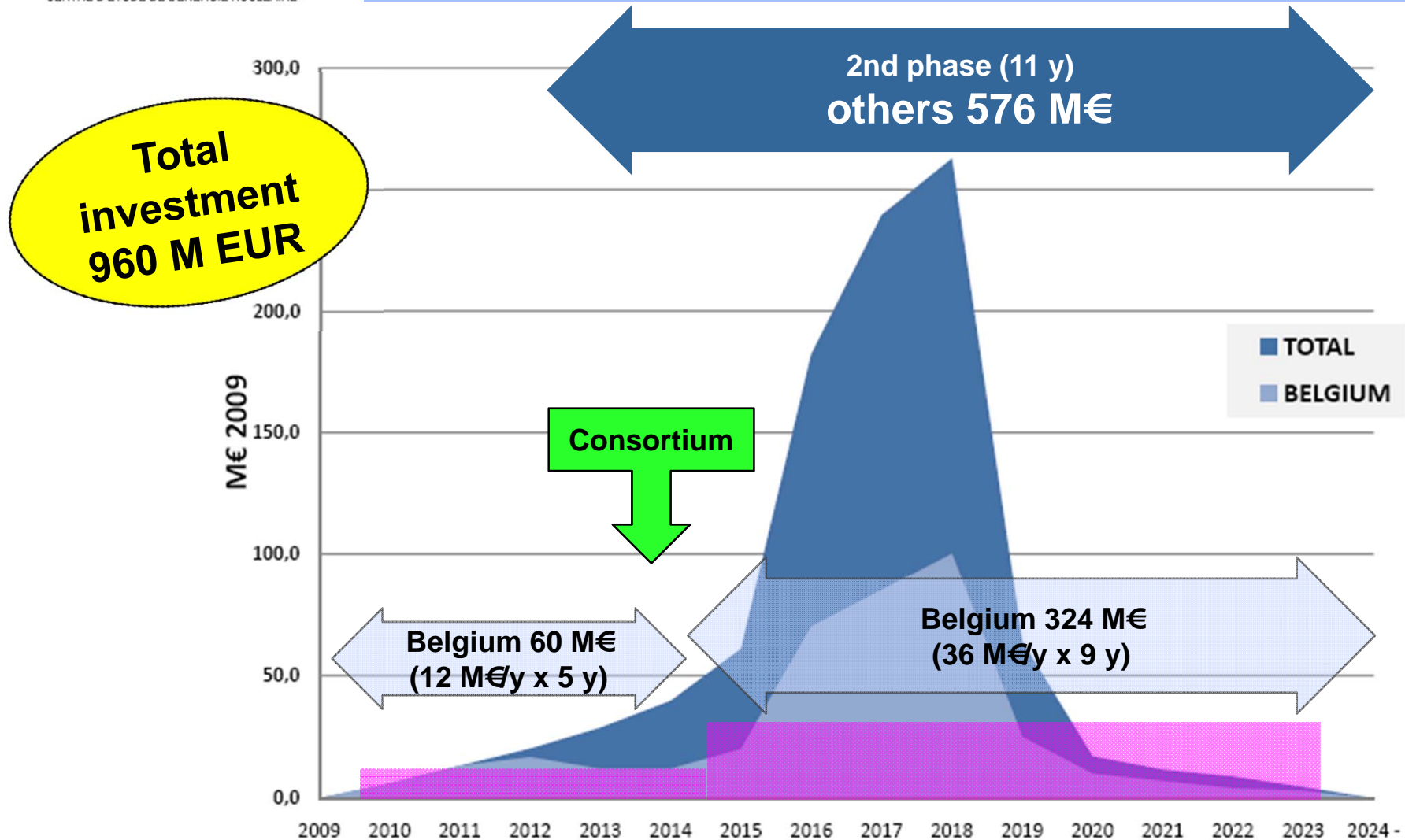

high priority project on ESFRI roadmap

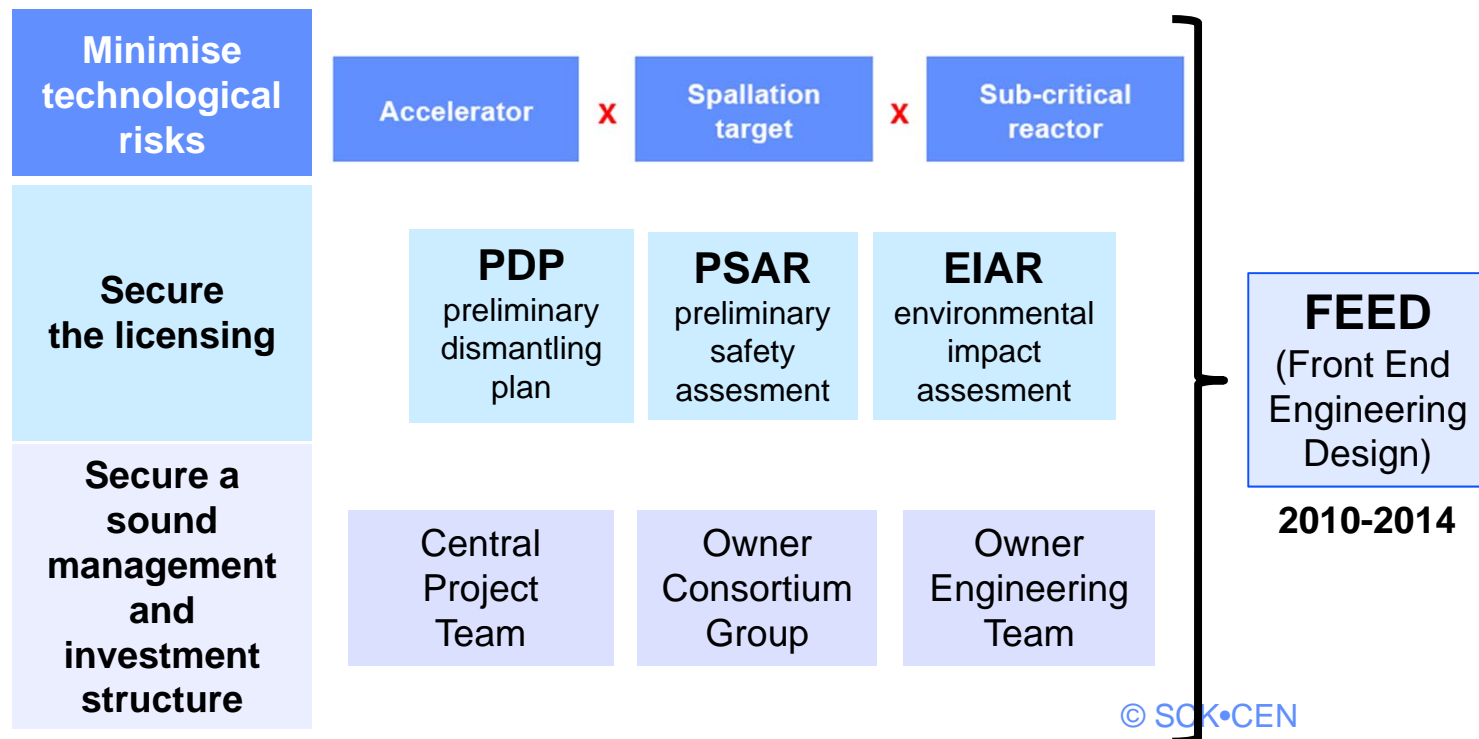
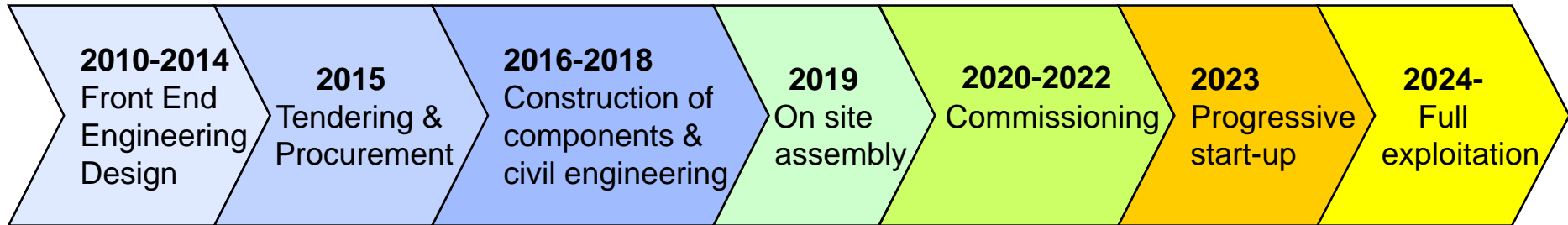
major RI for GEN IV

Belgian commitment: 40% secured
 International consortium: under construction



The project schedule





STUDIECENTRUM VOOR KERNENERGIE
CENTRE D'ETUDE DE L'ENERGIE NUCLEAIRE

MYRRHA international collaboration network



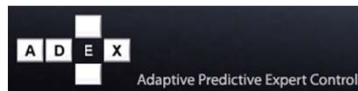
中国科学院
CHINESE ACADEMY OF SCIENCES



KAZATOM
НАЦИОНАЛЬНАЯ
АТОМНАЯ КОМПАНИЯ



TRACTEBEL Engineering
GDF SUEZ



- Belgium through MYRRHA project contributes to “Building Block 3” of the European P&T strategy
- Belgium is welcoming international participation in the MYRRHA consortium
- Membership eligibility for the international MYRRHA consortium is based on a **balanced in-cash/in-kind contribution**

- Until end 2014, our objectives are:
 - to collect **Letters of Intent** for participation in the MYRRHA International Consortium (**deadline mid-2012**)
 - to sign **Memoranda of Understanding** for collaboration in MYRRHA with international partners (deadline end 2013)
 - To finalise the **Consortium legal framework** (deadline mid 2014)

MYRRHA: EXPERIMENTAL ACCELERATOR DRIVEN SYSTEM

A pan-European, innovative and unique facility

- Time horizon: full operation ~ 2023
- Costs: ~ EUR 960 million

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SCK•CEN

Studiecentrum voor Kernenergie
Centre d'Etude de l'Energie Nucléaire

Stichting van Openbaar Nut
Fondation d'Utilité Publique
Foundation of Public Utility

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