

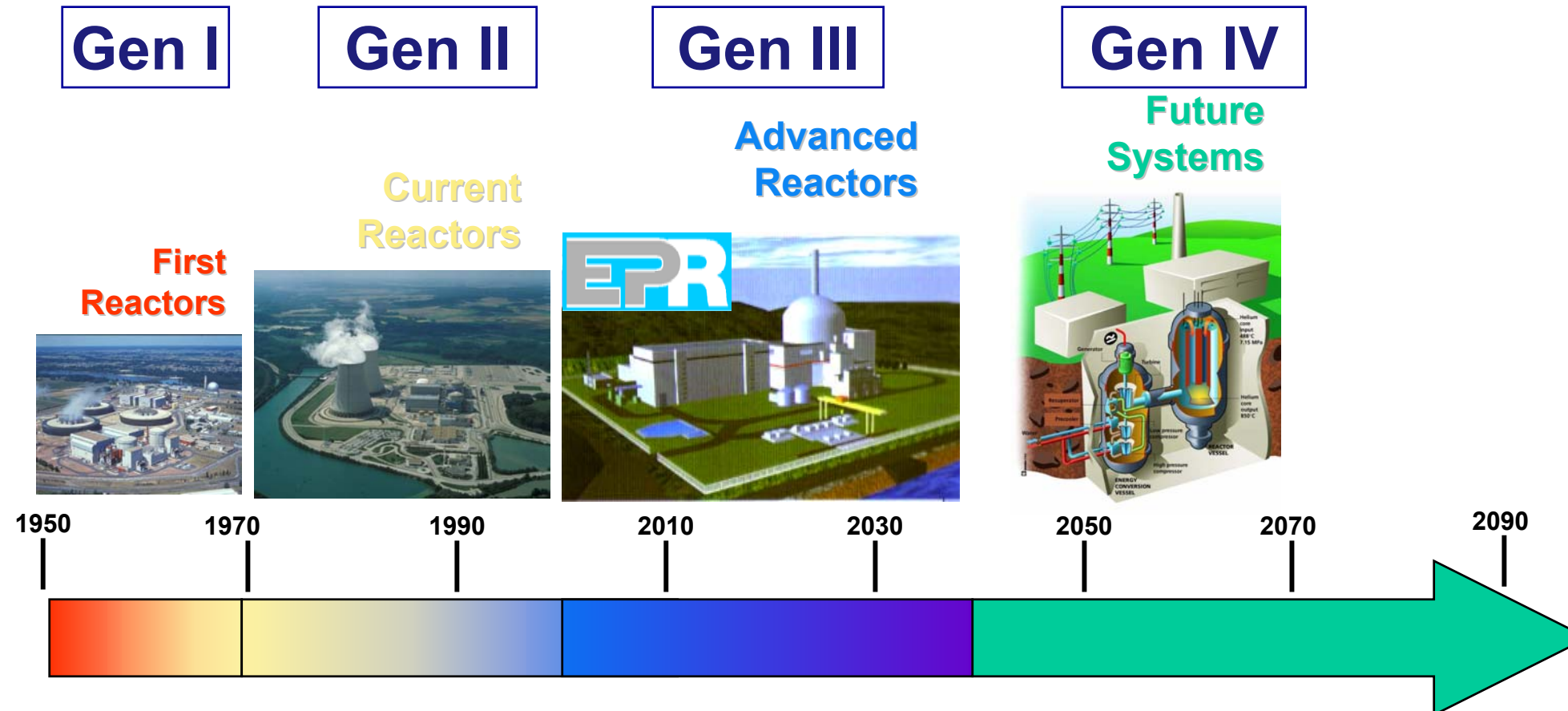


**Innovation needs knowledge :
View to the future**

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The Evolution of Nuclear Power



- ✓ Knowledge from Experience
- ✓ Knowledge from Science and Technology
- ✓ A long term view of Nuclear Energy



Nuclear Energy : Convincing results of the 2nd generation

An irreplaceable experience :

- ✓ 80% of the worldwide nuclear power plants, almost 400 reactors
- ✓ 17% of the electricity of nuclear origin
- ✓ > 10 000 reactor.years of experience

Convincing results :

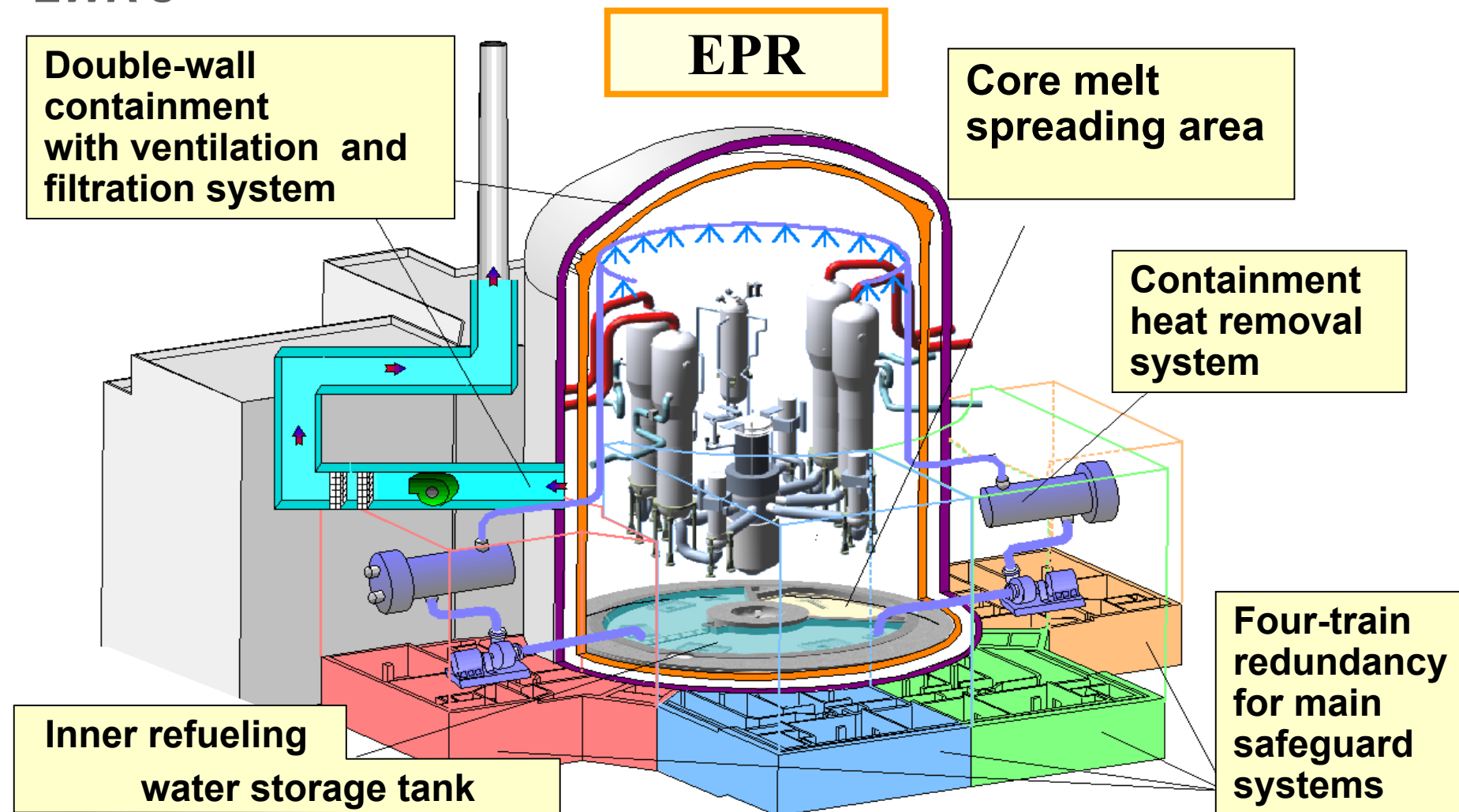
- ✓ Economy proven
- ✓ Safety : satisfactory data since 18 years
- ✓ Reliability in constant increase





Gen III : significant improvements in safety,

*... but also in economics, waste reduction and U preservation.
Matured concepts, based on experience feed-back of current LWR's*





4th generation : towards sustainable nuclear energy

➤ New requirements for sustainable nuclear energy

- Gradual improvements in :
 - ✓ Competitiveness
 - ✓ Safety and reliability
- Concepts with breakthroughs
 - ✓ Minimization of wastes
 - ✓ Preservation of resources
 - ✓ Non Proliferation

➤ Assets for new markets

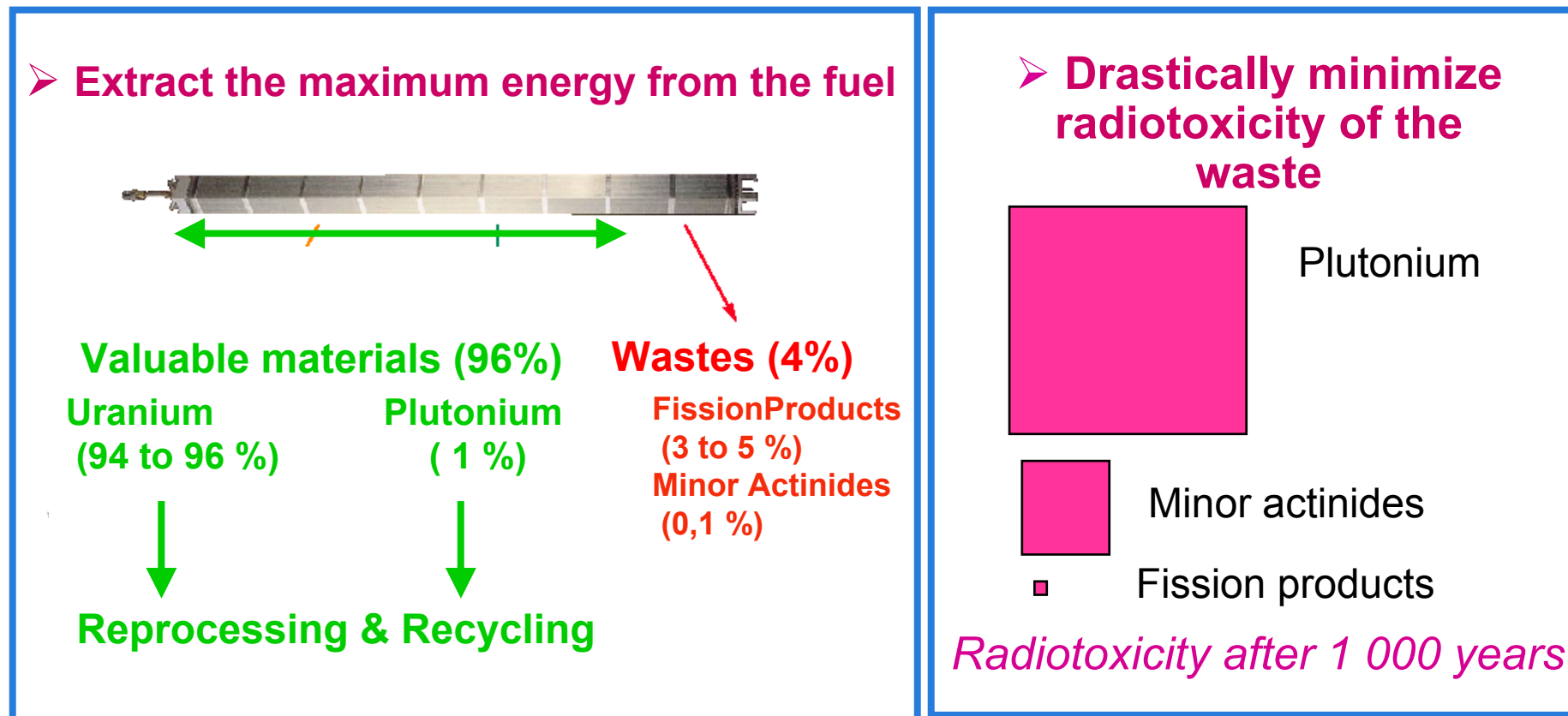
- hydrogen production
- direct use of heat
- sea water desalination

➤ An internationally shared R&D





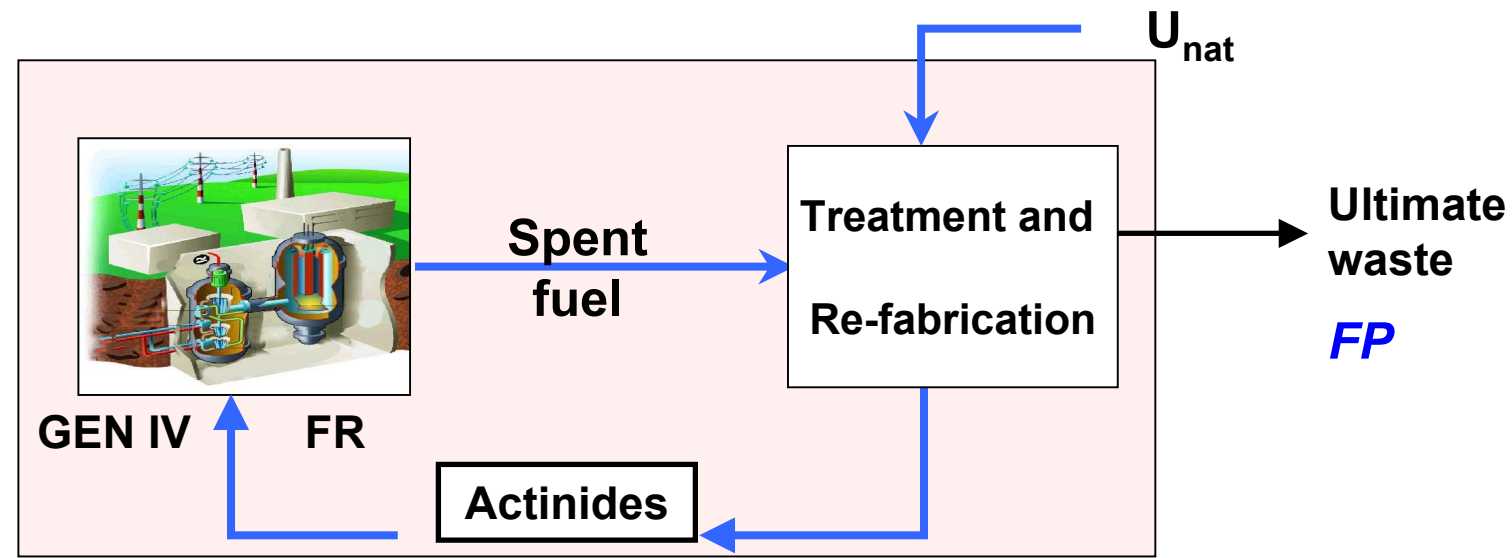
Reprocessing & Recycling, a cornerstone for future energy needs



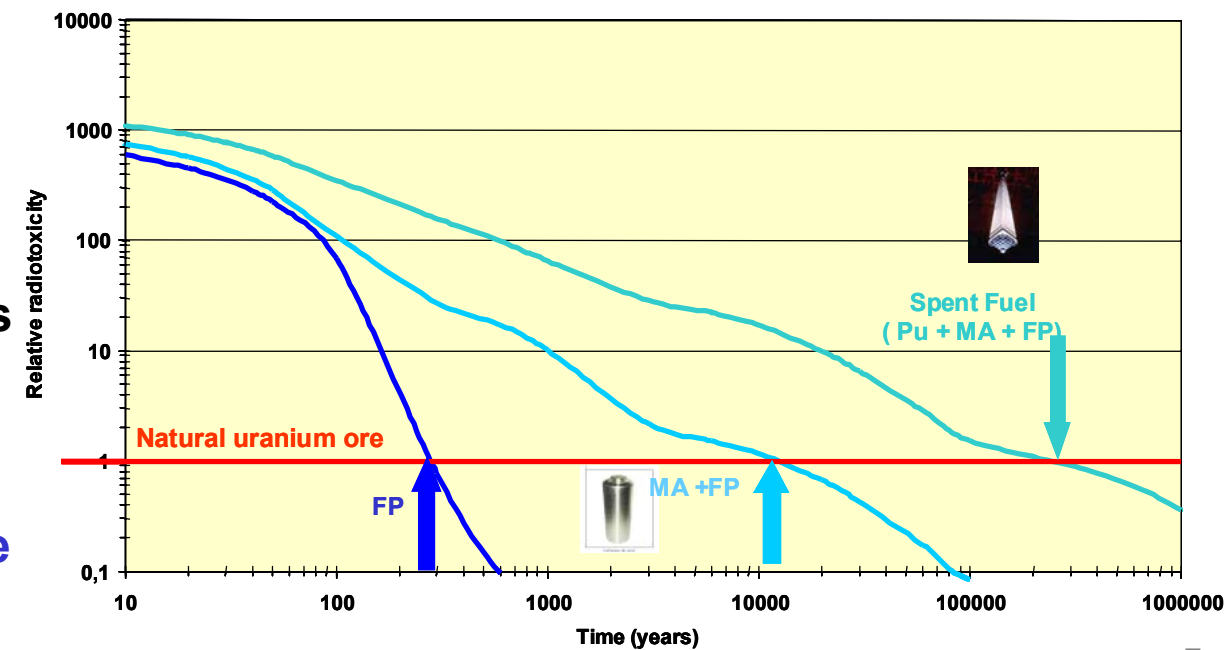
➤ **Pu stockpile stabilisation : the Pu produced is consumed in LWR**



Gen IV Systems with full actinide recycling

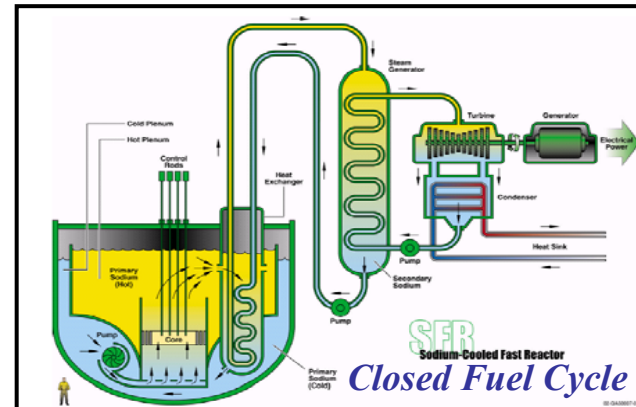


- **Drastic minimization of ultimate waste :**
 - Very small volumes,
 - Drastic decrease of the radiotoxicity (hundreds of years instead of hundreds of thousands years)
- **Optimal use of energetic materials**
- **Significant Proliferation Resistance features**

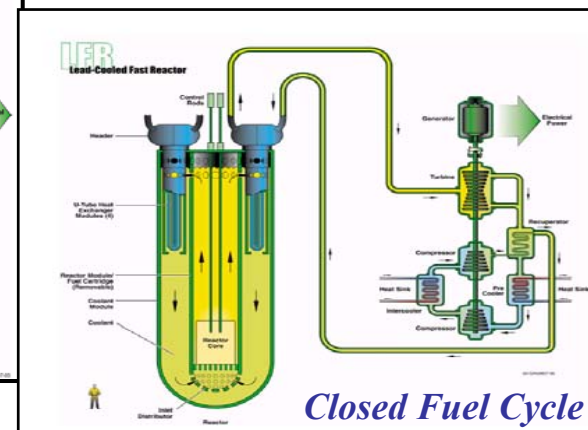




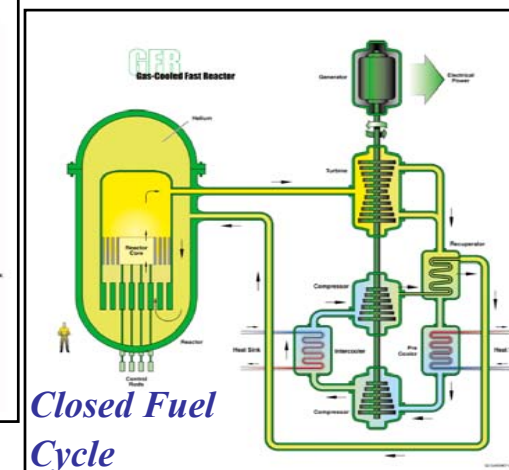
6 Innovative concepts with technological breakthroughs



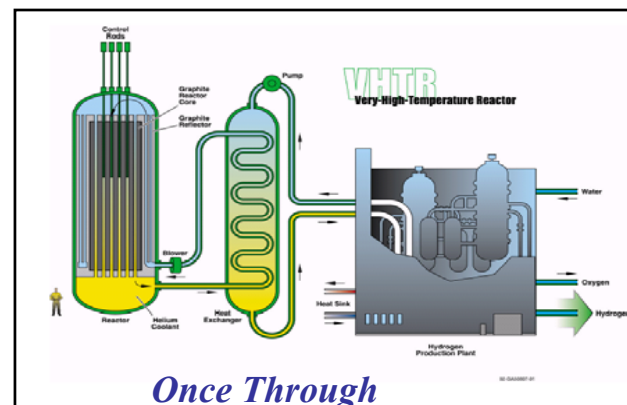
Sodium Fast reactor



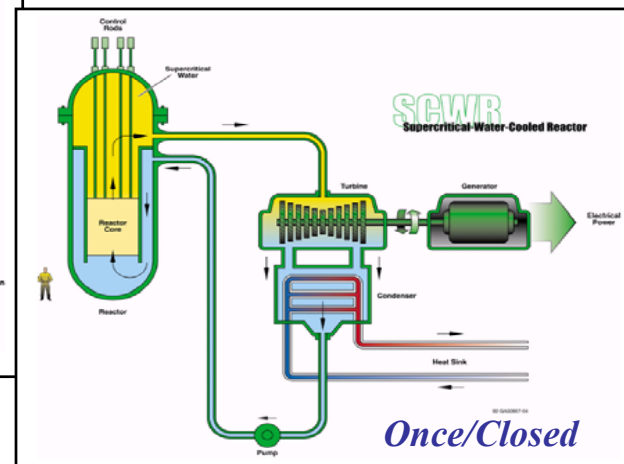
Lead Fast Reactor



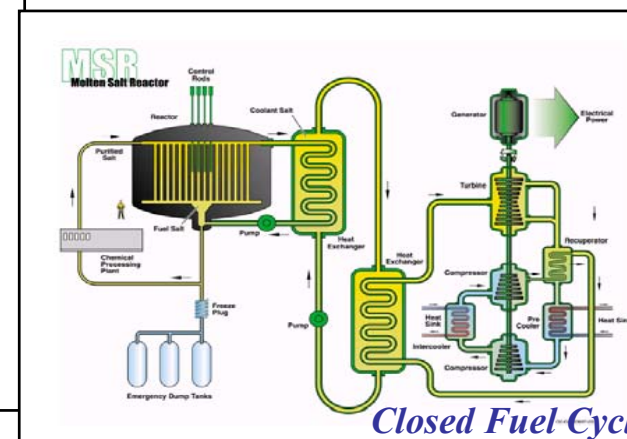
Gas Fast Reactor



*Once Through
Very High Temperature Reactor*



Supercritical Water Reactor



Molten Salt Reactor



CONCLUSION

Nuclear Energy should play a major role in this century

Innovative 4th generation Nuclear Energy Systems have a high potential for a sustainable energy supply, and technical solutions should be ready as soon as possible

Innovative needs knowledge, human resources and long term views