Fusion Transmutation Reactor
-Feasible early use of fusion fast neutron

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October 2, 2009
Fusion-Fission Hybrid workshop, Gaithersburg, MD

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2. characteristics of FTR
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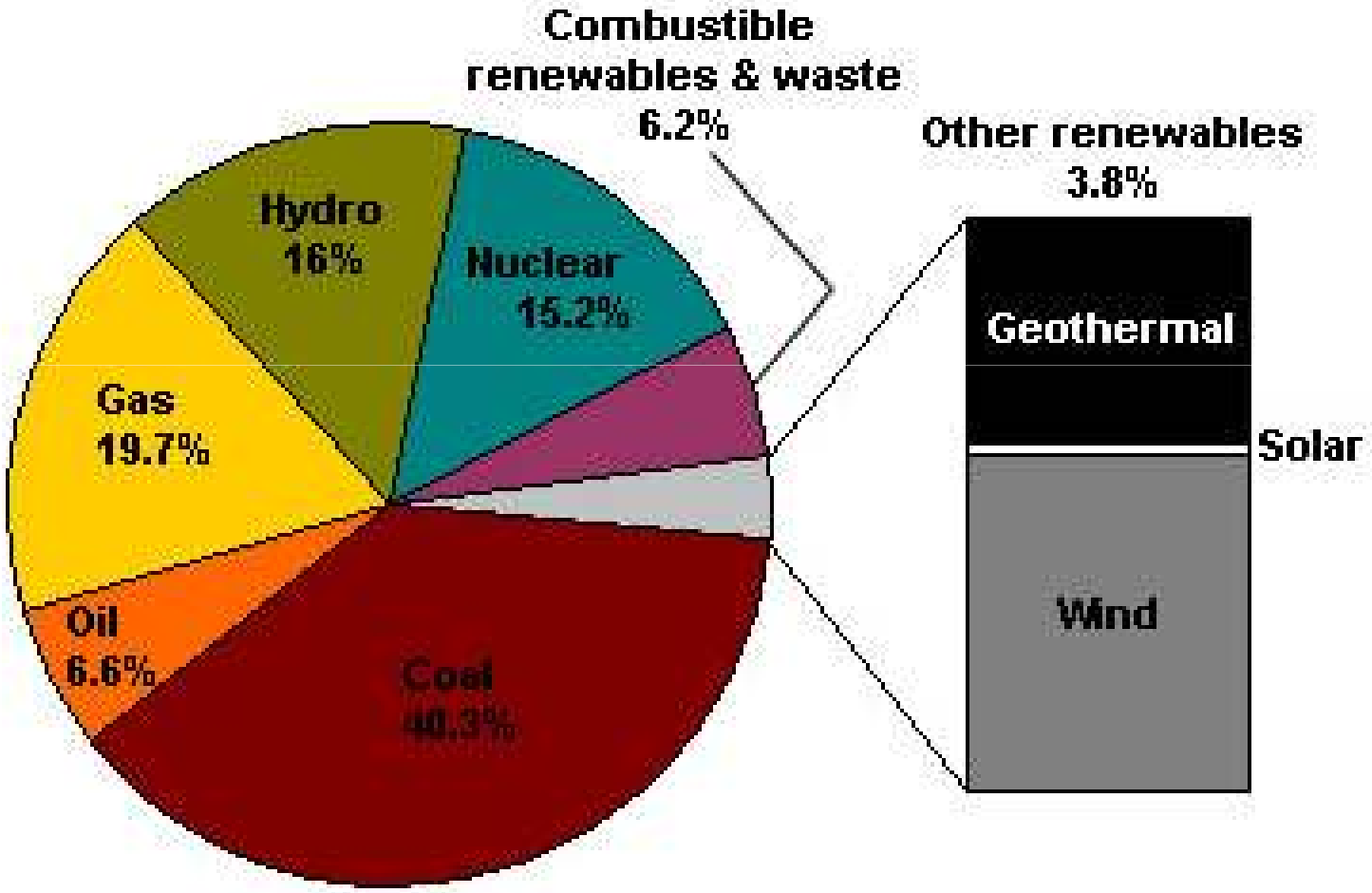
climate change
- regional to global
- speedy

World Electricity Generation by Fuel, 2005



Some observation made :

1. Propagation of the modern industrialization in northern hemisphere going west with time flow ... Europe + Russia -> N-America->Japan->Korea ->China (+South East Asia) -> India -> Middle East

2. We created **speedy CO2 production system** using high speed computers, could not stop or slow down due to Globally linked economy

3. And this system is also **growing rapidly in volume** (IN, CN, SE Asia)

mostly based on **a mix of Carbon Fuel + IT** Economy

results

the Speedy ice melting, ocean temperature and sea level rise, climate change

For our sustainability **speedy deployment of counter measure** **is required**

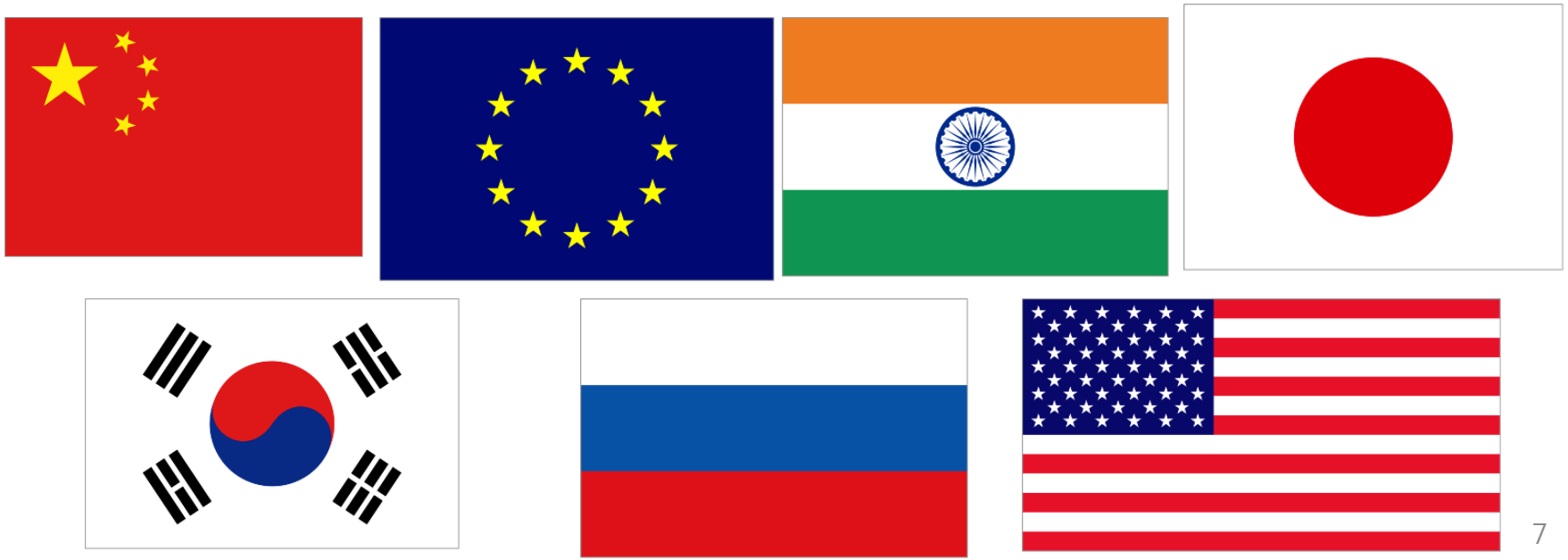
High density non-carbon energy resource -> **Nuclear Energy**

atmosphere for FTR

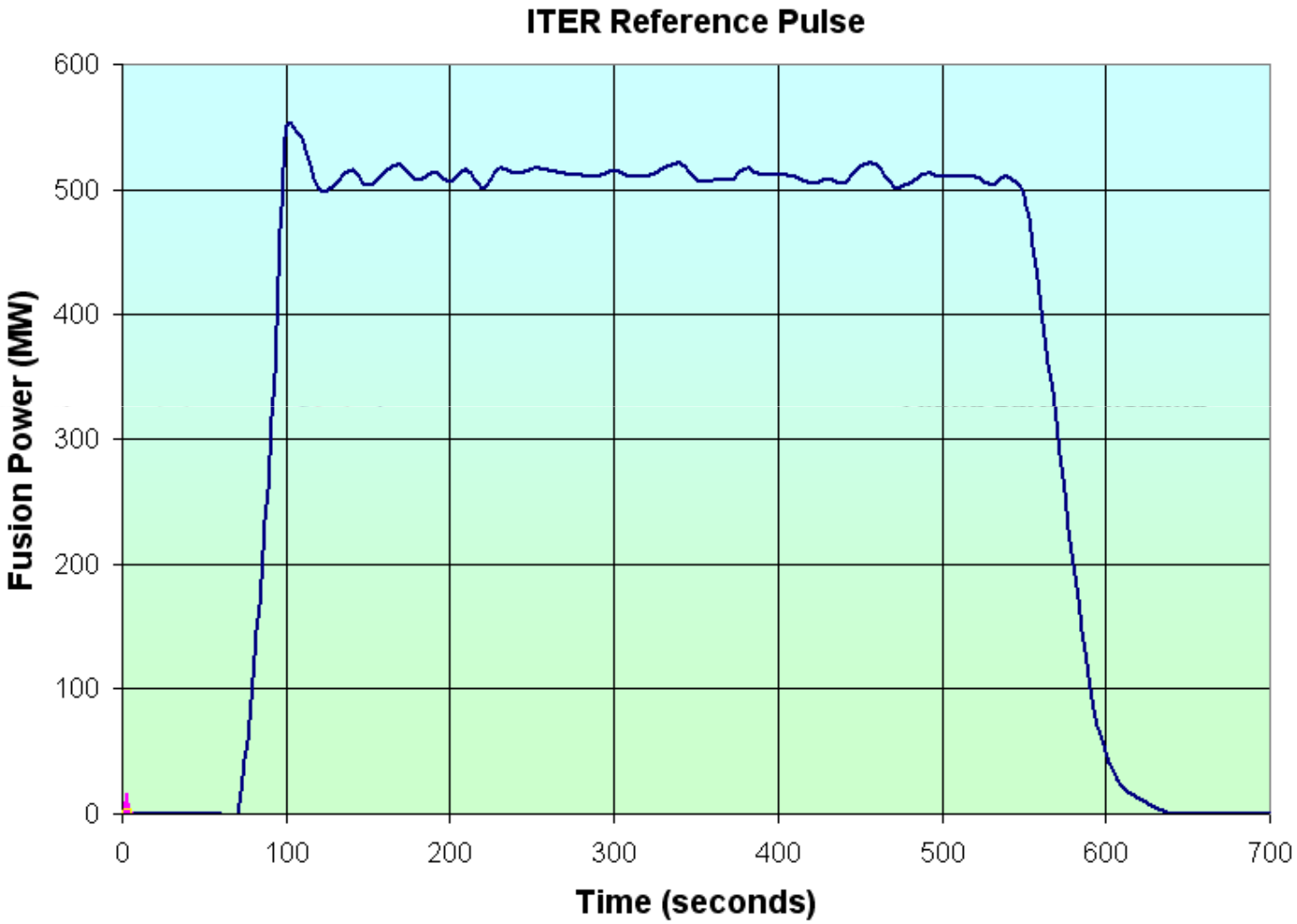
ITER Project launched

ITER is a joint international research and development project
(7BUSD const in 10yrs + 20yrs ops + 5yrs decommissioning)
that aims to demonstrate the scientific and technical feasibility of fusion power.
Q > 5-10, 400-1000sec to steady-state operation

The partners in the project - the ITER Parties - are
EU(represented by EURATOM), **Japan**, **China, India, Korea, Russia and US**
ITER construction started in 2007



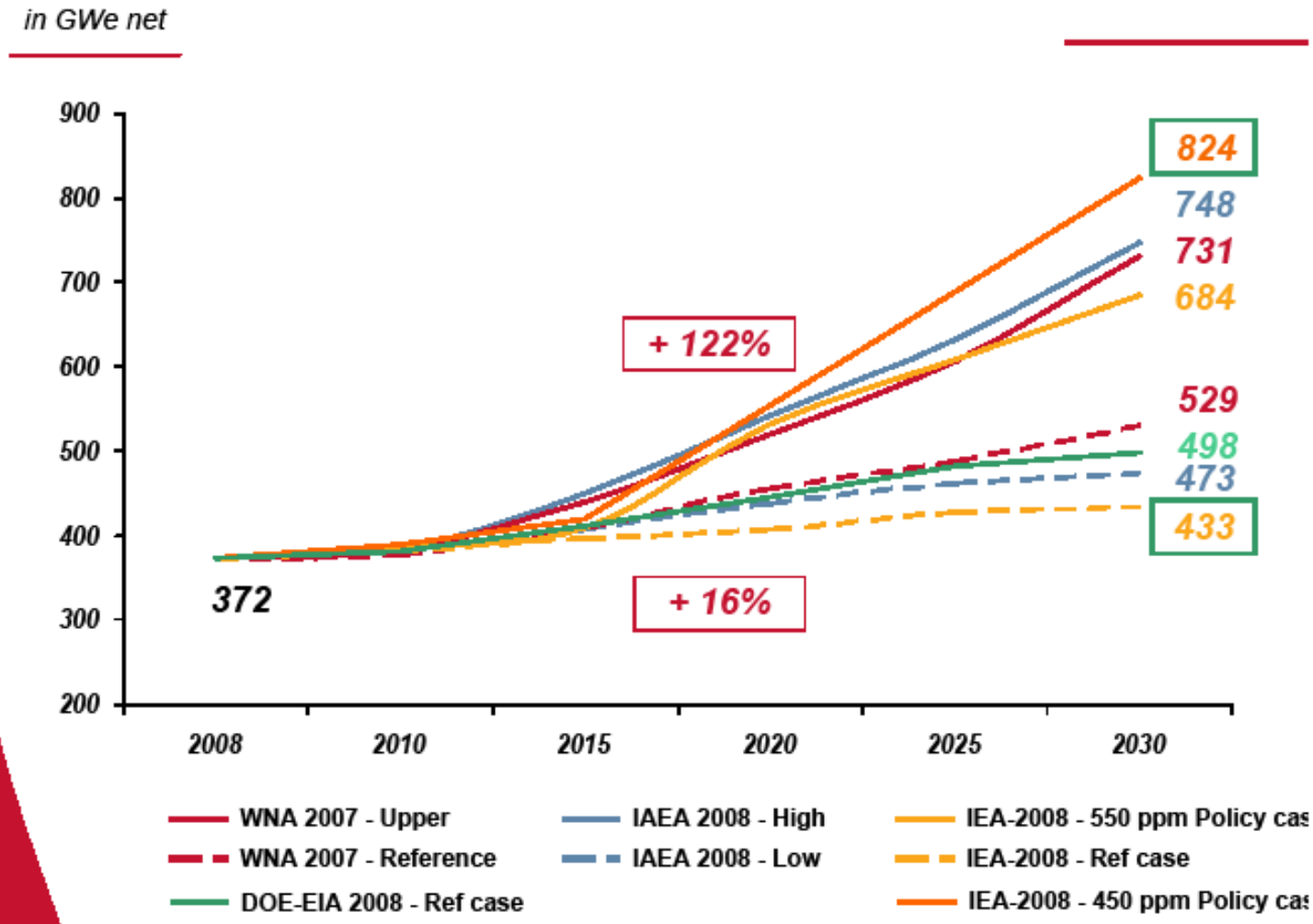
Fusion Power Production



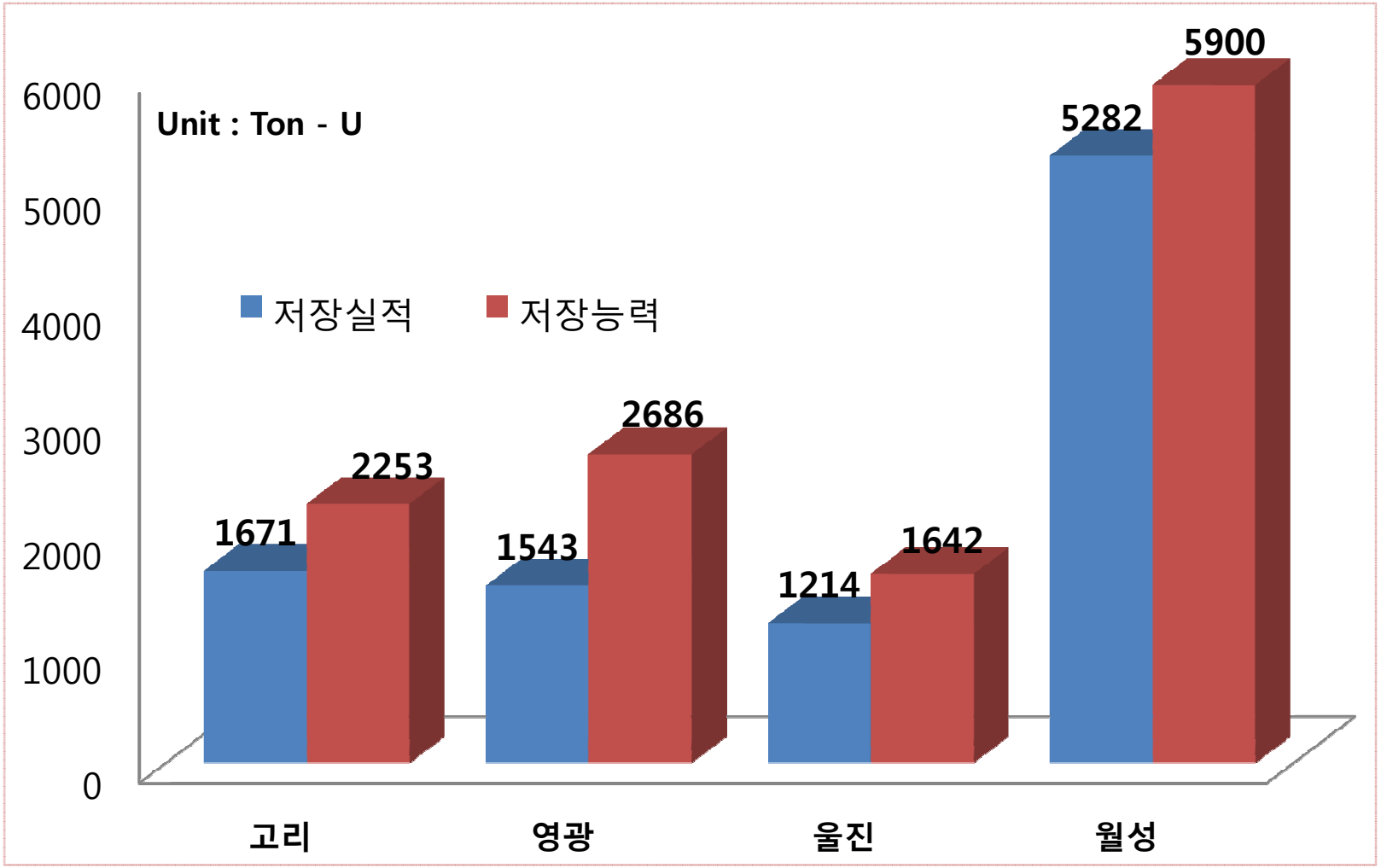
Global expansion of nuclear energy

AREVA

Nuclear capacity forecasts for 2030



Status of SNF storage capacity in KO



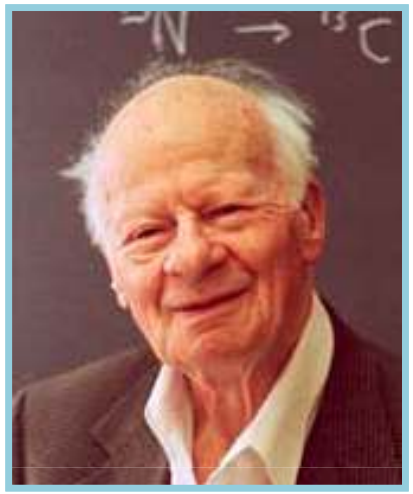
2008년 8월 22일 매일경제

FTR characteristics

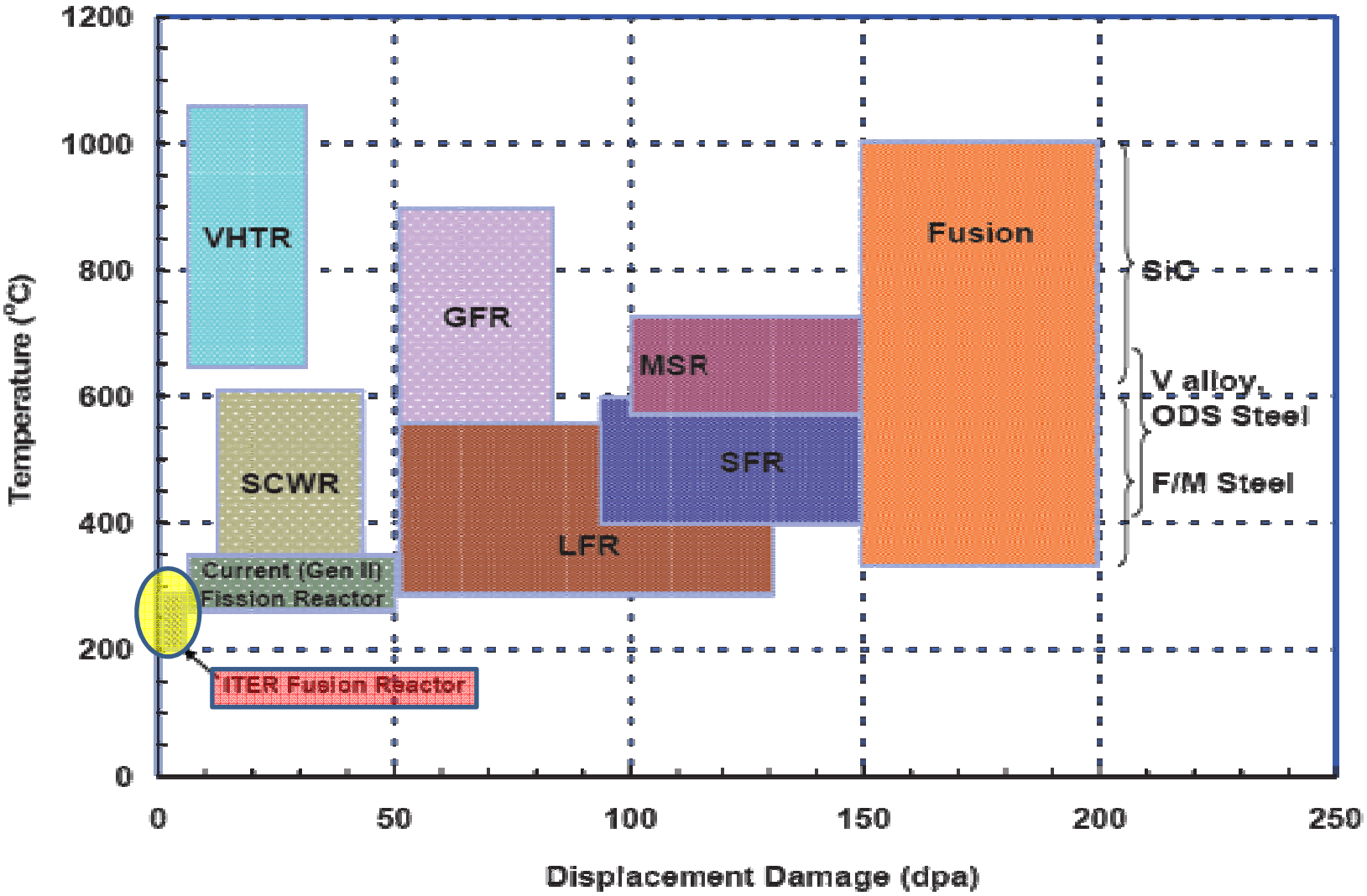
Noble idea-Fusion-Fission Hybrid Reactor

from 60's till NOW continued recommendation from world nuclear, fusion leaders

- Originator and successors
  - 79' Hans Albrecht Bethe (1906-2005)
    - 1967 Nobel Prizer
  - Jeff Freidberg
    - author of "Ideal MHD"
  - 08' Paul-Henri Rebut
    - JET (Joint European Torus) Director
    - ITER CDA Director



Selection of Materials for Nuclear Reactor Structures



Humbleness maintained!

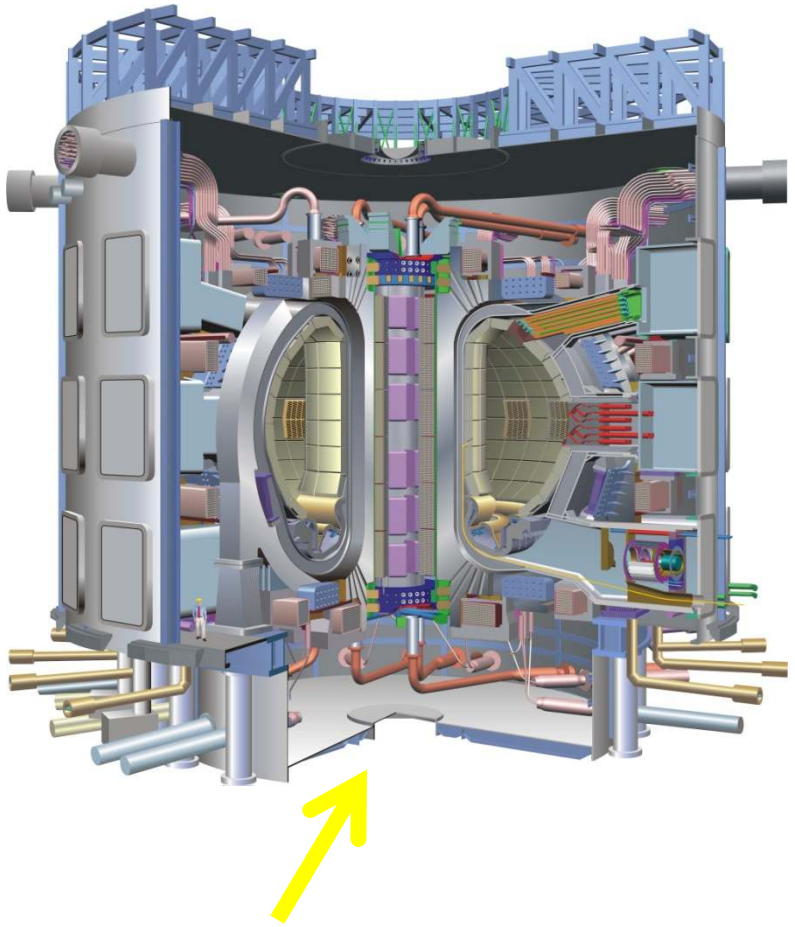
FTR does use Existing or Near-term developed Technology and Material in Fission and Fusion

- Structure material, divertor heat load, TBR maintained from fission
- Proven plasma operation mode
- Q < 5, low thermal fusion power
- pulsed mode operation, less cost for heating, diagnostics, power supply
- subcritical fission reaction
- passive safety
- use established fission and fusion nuclear technology

Bridging commercially available fission technology to remote fusion energy commercialization

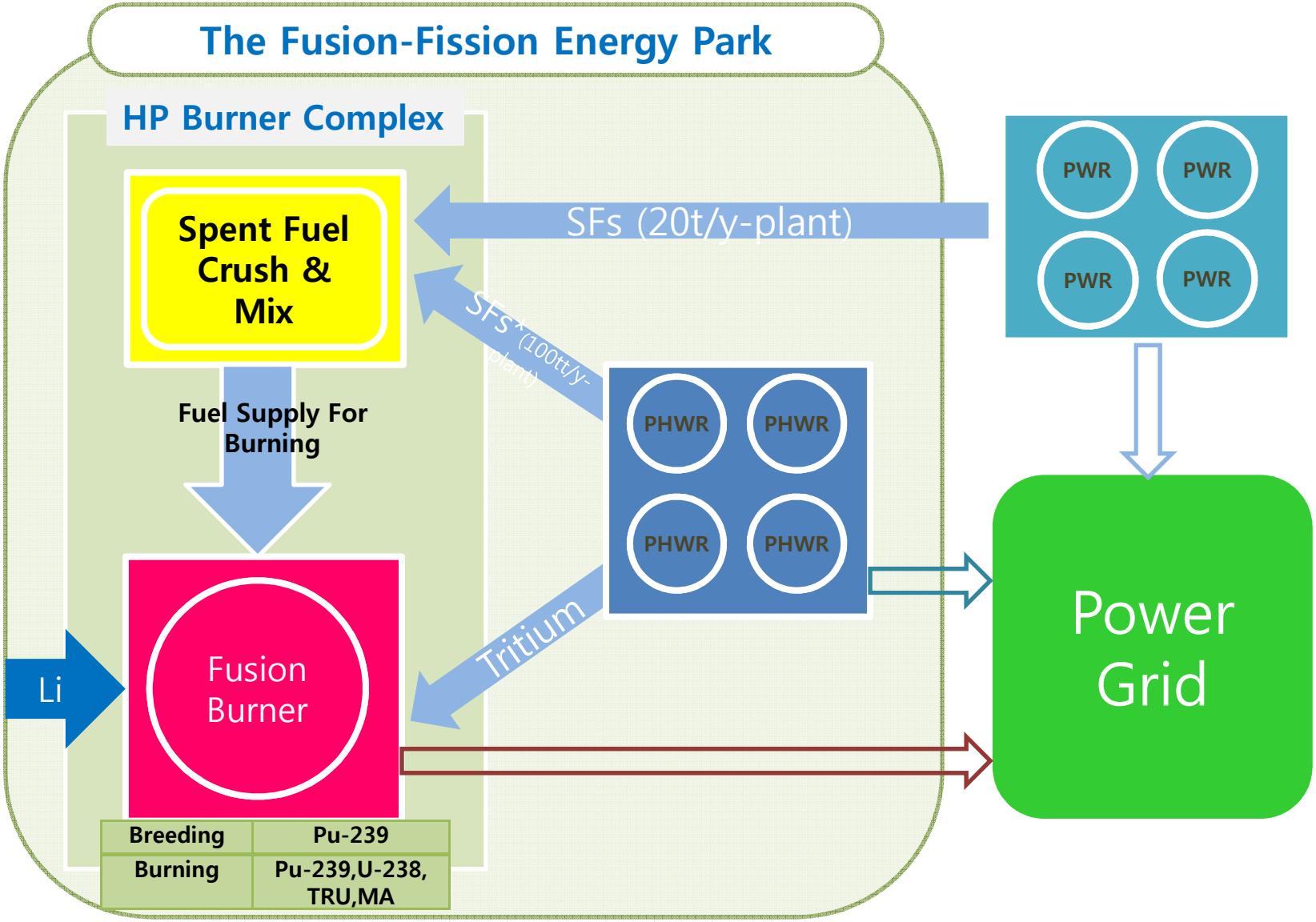
CDA -> EDA

- Plasma volume
- **Blanket volume**
- Magnet volume (cold mass volume)
- **Fuel cycle (fusion + fission)**
- Material (structural, PFC)
- Ancillary system
- Interface volume
- Assembly + Maintenance system
- Safety + containment
- Duty cycle + availability
- Pumping + vacuum volume
- Heat removal + cooling system
- **BOP**
- Costing

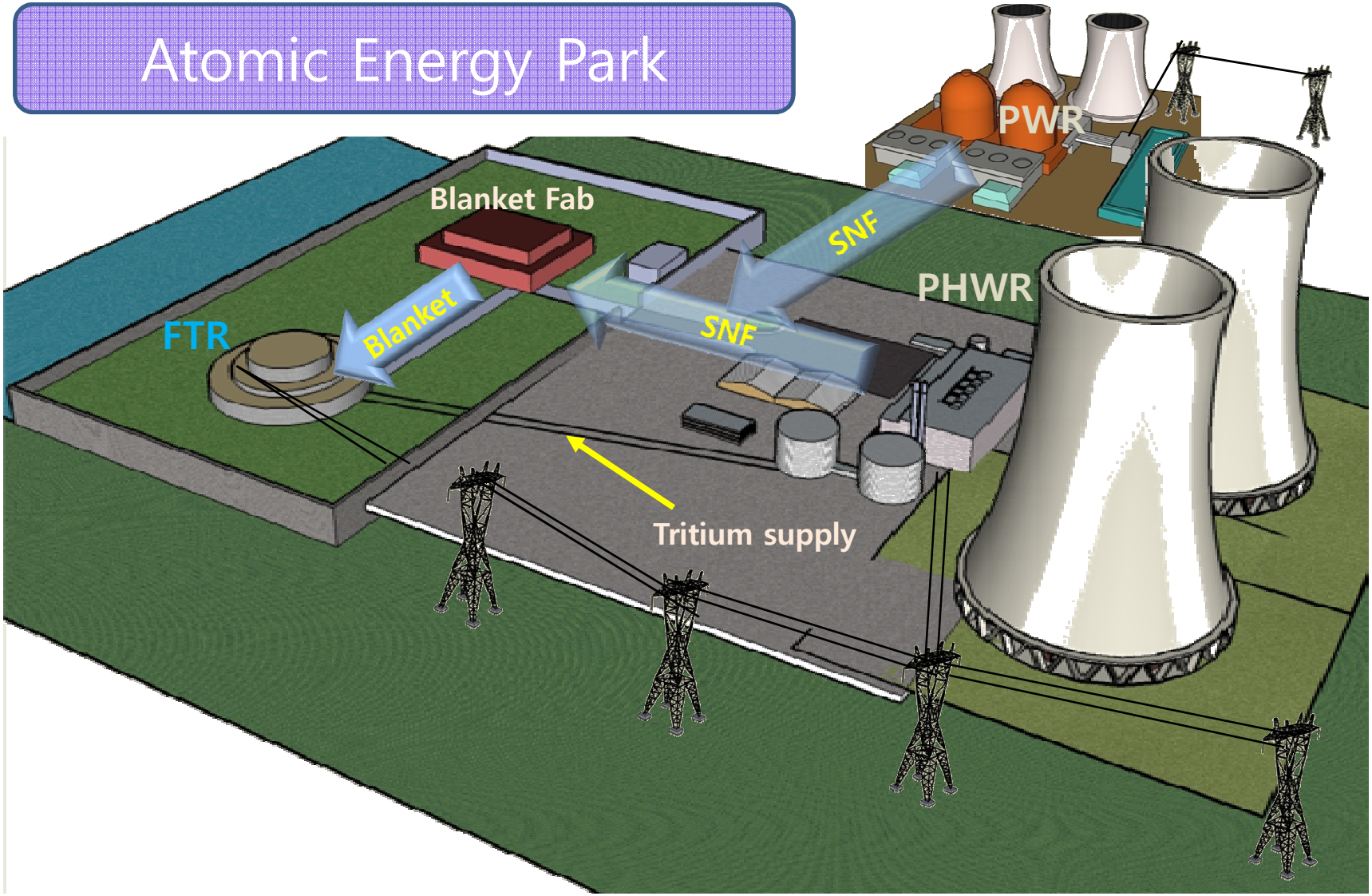


* **blue: for Hybrid, black: via ITER r&d activity**

SNF burner and Electricity Generation



FTR with PWR, PHWR



implementation consideration and plan

Consideration for FTR implementation

1. Technically feasible? Can be built to an industrial grade?
   What quantitative advantage over other technical competitor?
   R&D -> Engr. -> manufacturing within time, A system is ready?

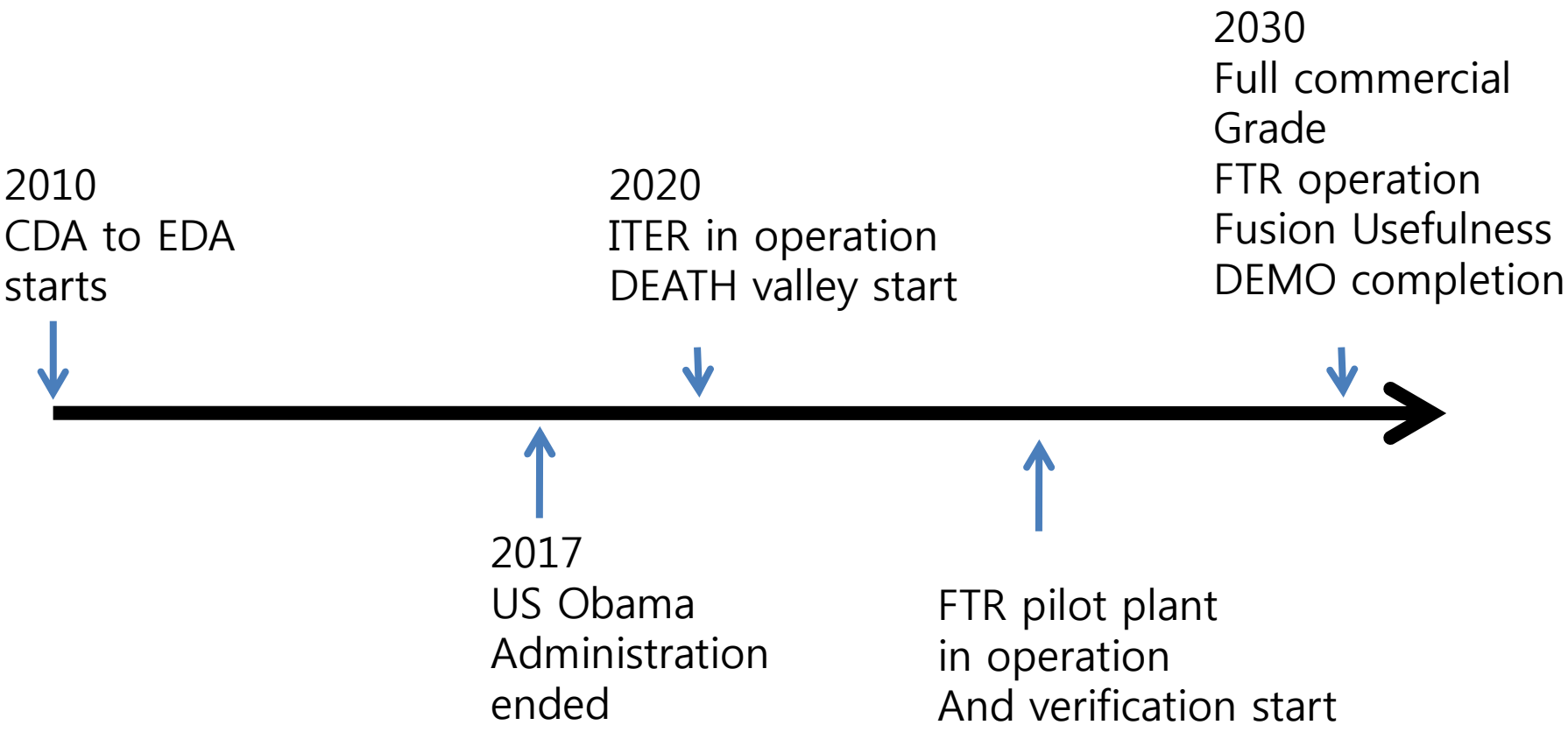
2. Who will use? Who will buy?

3. How urgent? When it could/should be done? Any priority setting is made?

4. How much does it cost? Use public money or **private**?
   How financing could be done?

5. Who will approve? Any implementation law available/international
   Framework available? Under what framework could it be implemented?

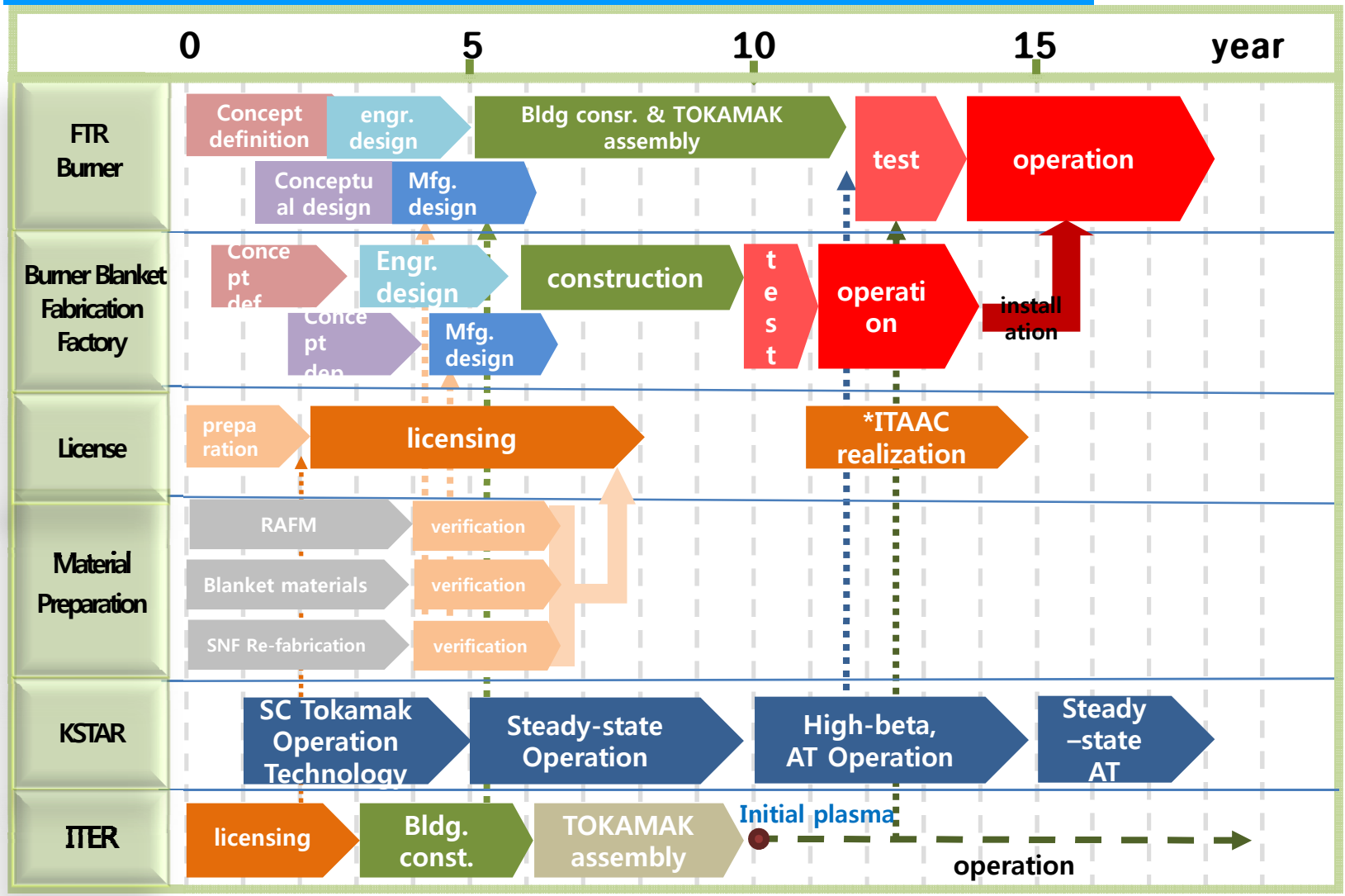
Timing consideration



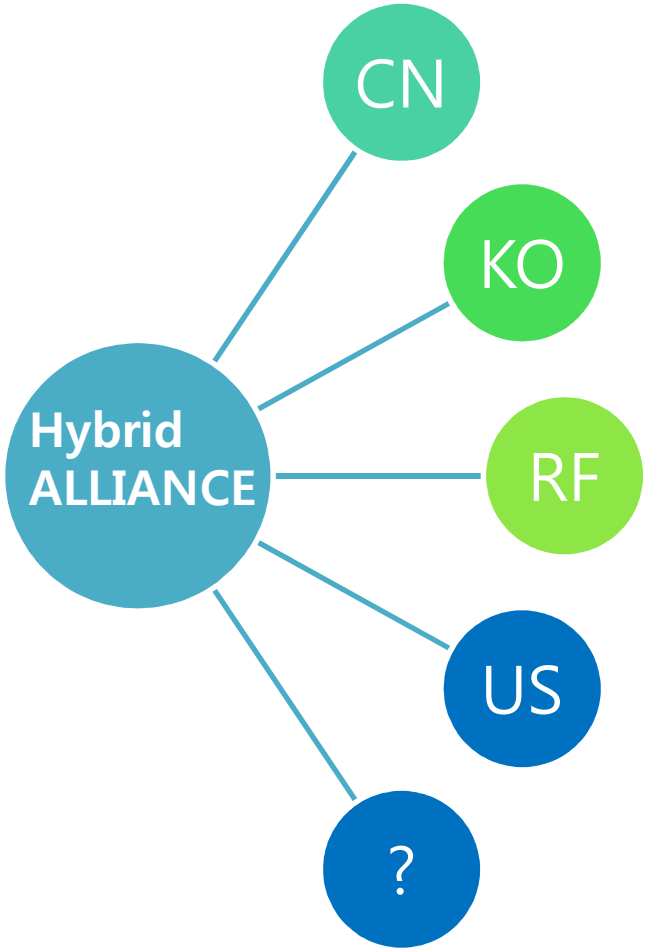
Time to check a readiness for FTR implementation

- Check fusion side details/readiness
- Check fission side/readiness
- Check interface development/readiness
- Check for detailed planning
- Establish step by step process

FTR development schedule



A foundation for propulsion need to be structured



Wolf do practice communication!
We need to learn the same skill!

Mongolian Warrior…
The NEW Way vs. The OLD Fort

Genghis Khan
1167-1227