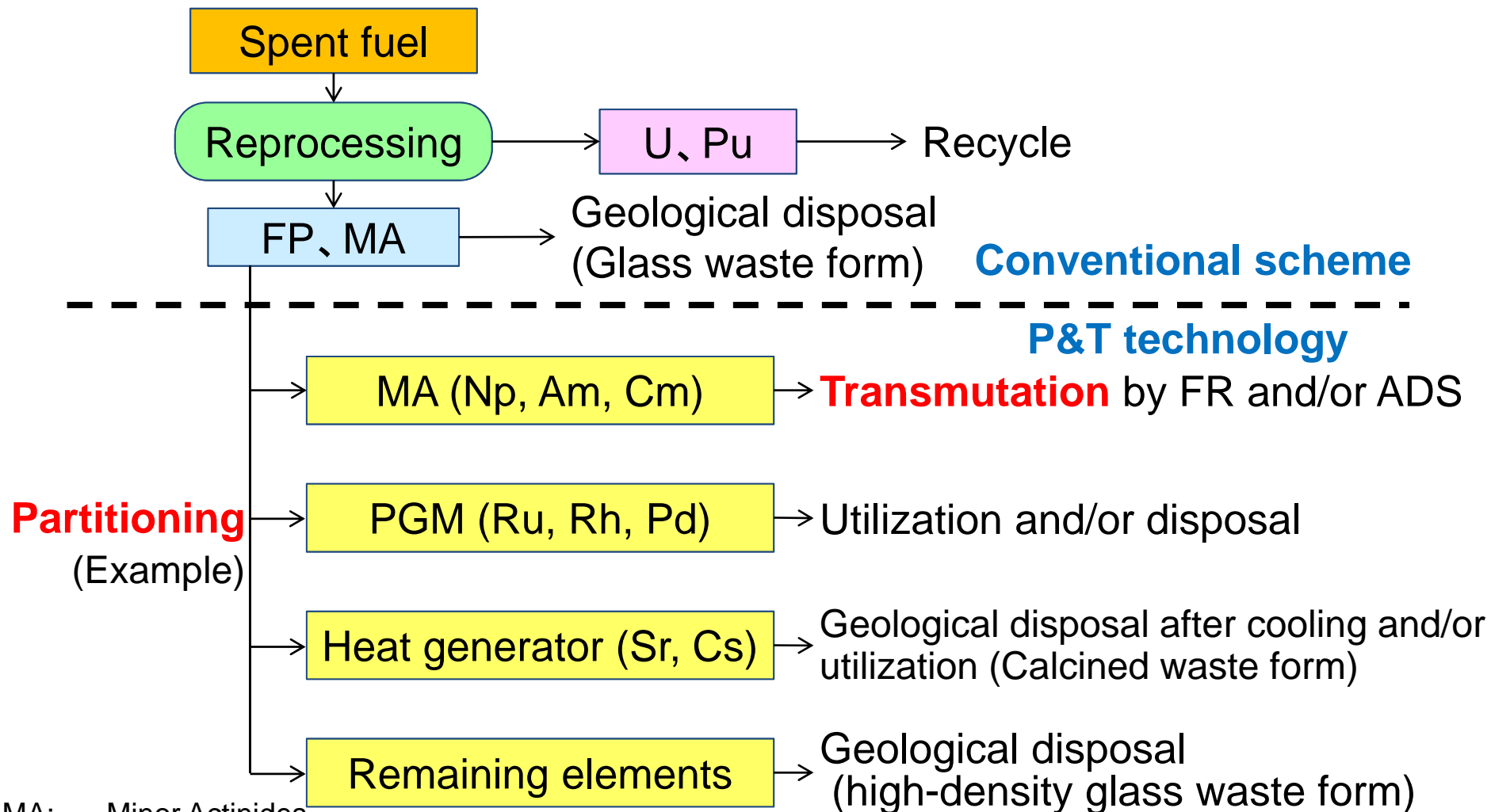




Perspectives of Partitioning and Transmutation Technology

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Partitioning and Transmutation (P&T)



MA: Minor Actinides
 FP: Fission Products
 PGM: Platinum Group Metal
 FR: Fast Reactor
 ADS: Accelerator Driven System

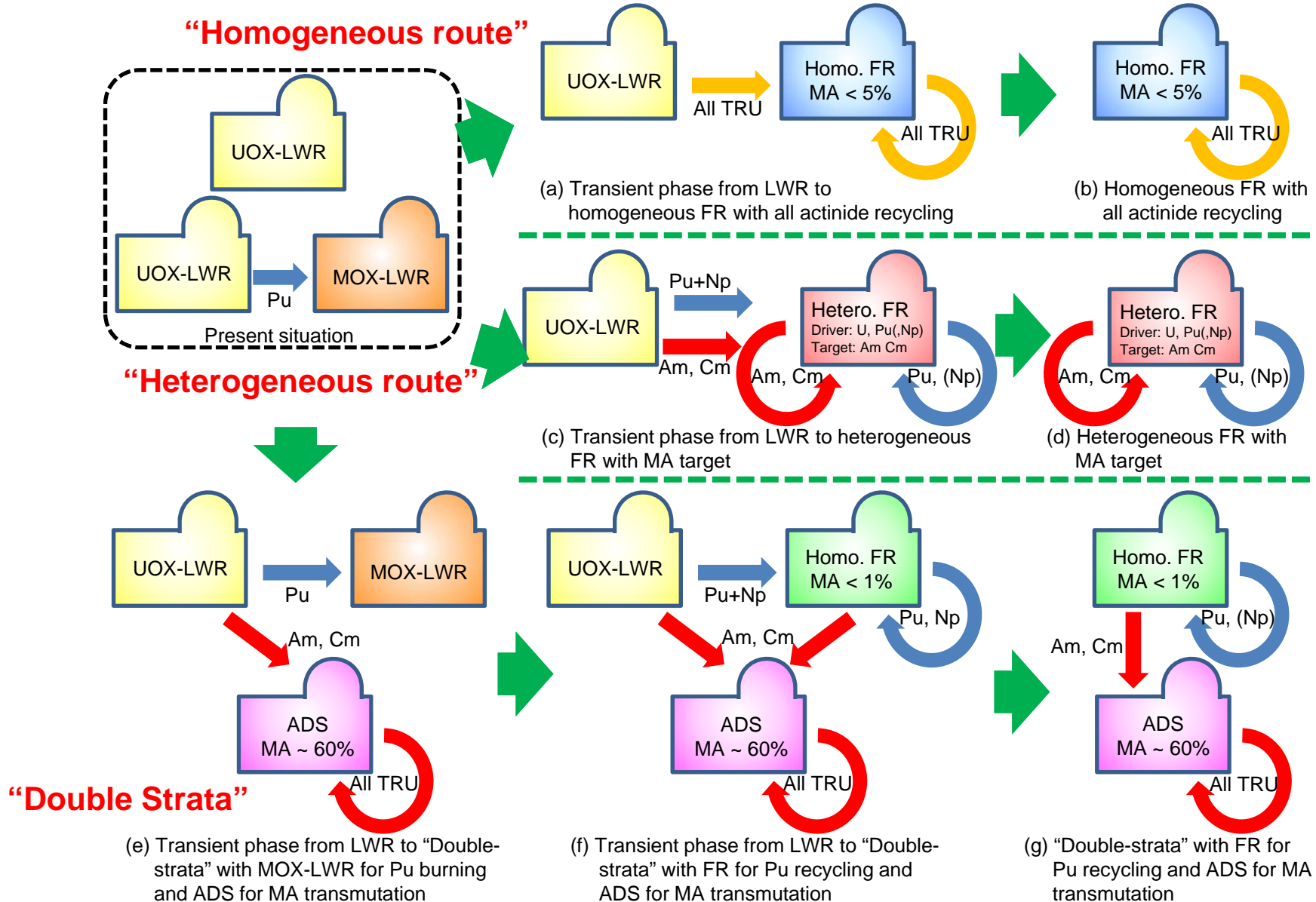
Possible Benefits of P&T

- ✓ Reduction of long-term radiological toxicity
 - ✓ Reduction of dose for future inhabitants
 - ✓ Reduction of amount of HLW
 - ✓ Reduction of repository size
 - ✓ Recovery of valuable materials from wastes.
- To mitigate difficulties caused by long-term nature of radioactivity
- To extend capacity of a repository



Enhancement of sustainability of nuclear power

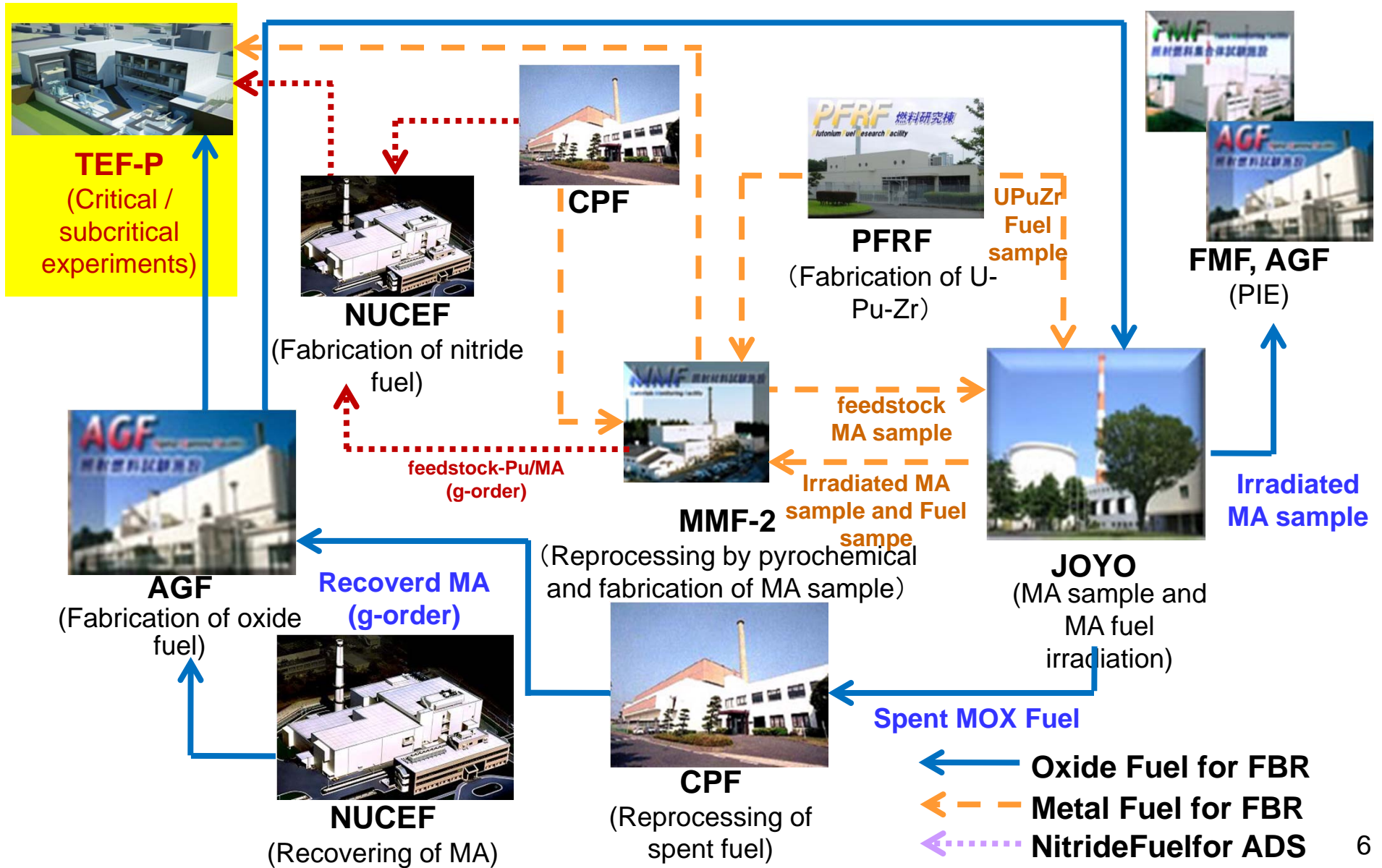
Types of Transmutation System and their Transition Phase toward Sustainable Nuclear Energy



Check and Review (C&R) by Japan Atomic Energy Commission (JAEC)

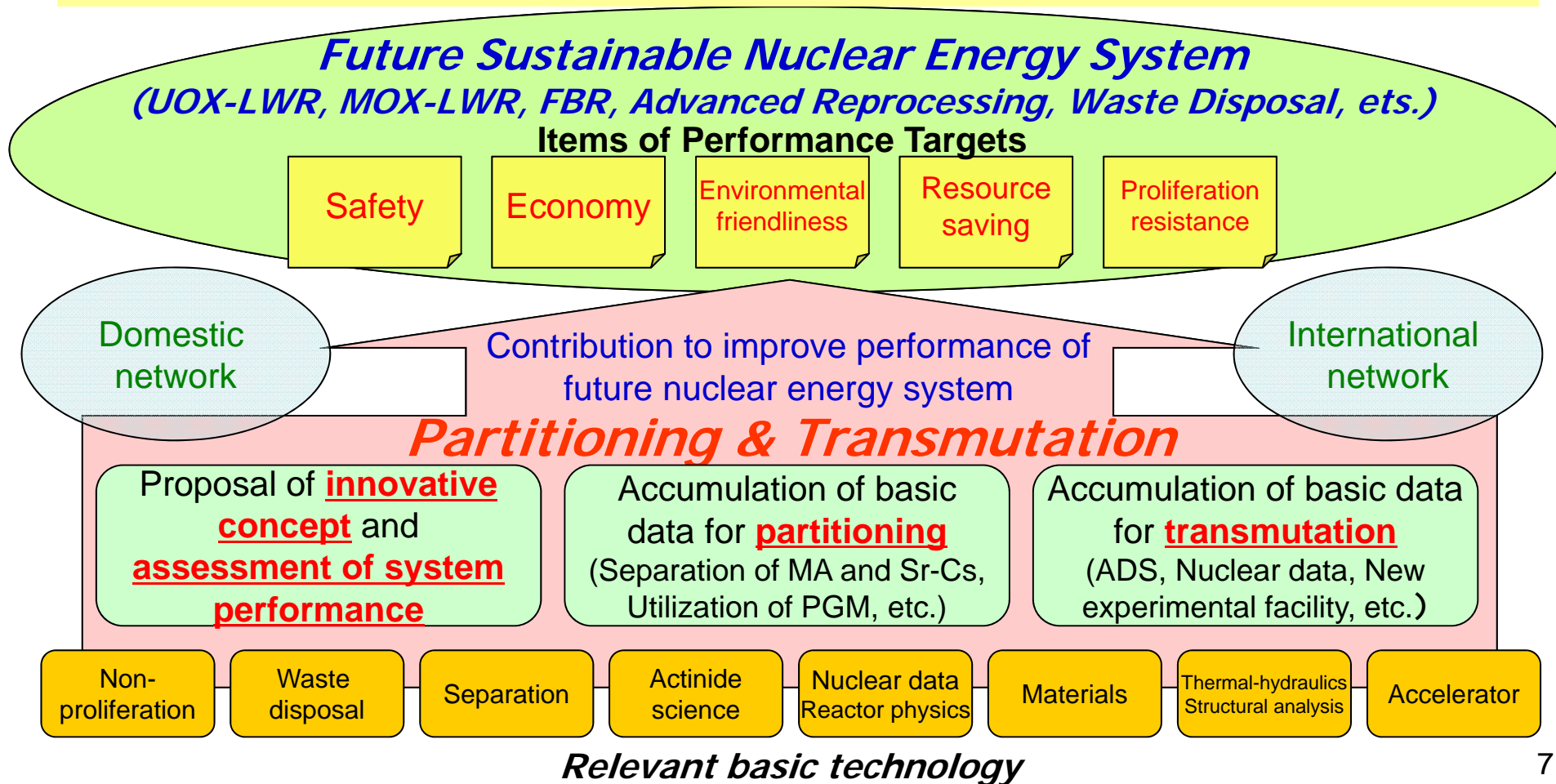
- The second C&R was conducted by JAEC in 2008-2009.
- The final report mentioned that the significance of the P&T technology is in three points:
 - reduction of the potential hazard,
 - mitigation of the requirement for geological repository site, and
 - enhancement of the options in the design of the whole system of waste disposal.
- The current technology levels of the P&T were evaluated.
 - Although the technology levels of some parts of the FBR cycle system are between basic research and engineering demonstration, the P&T technology in general is still in the basic research because of the lack of experimental data for MA
 - It was, therefore, strongly recommended to **accumulate the experimental data for MA** as a common basis for both FBR and ADS.

Concept for MA Recycle Test in JAEA



P&T for Sustainable Nuclear Energy

- Despite of various nuclear policies, the burden of HLW management is a common issue.
- P&T is interdisciplinary and integrated technology to enhance the sustainability of nuclear energy utilization.
- Since it is difficult to develop whole areas of the technology by one country, R&D coordination by international network is of great importance.



Concluding Remarks

- ◆ To mitigate the burden for the management of spent nuclear fuels, P&T technology should be continuously promoted by consolidating state-of-the-art technology of various scientific and engineering fields.
- ◆ It is of great importance to coordinate world's R&D activities under an international network.
- ◆ In particular, the small-scale demonstration of MA recycling should be the next target to break through the barrier for the realization of P&T technology.