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Nuclear Technology for Climate

Mitigation, Monitoring, Adaptation

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Radioactive waste and spent nuclear fuel management: current challenges

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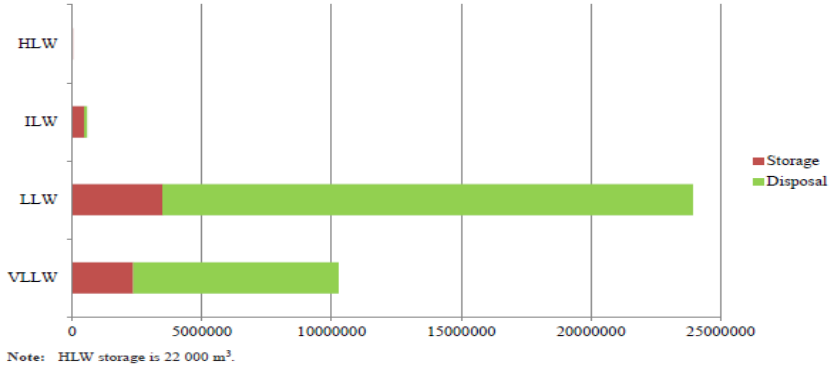
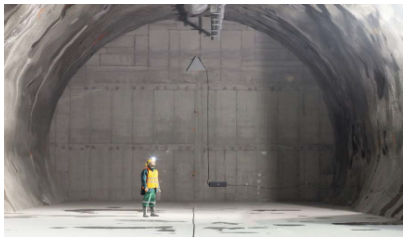
The current situation in SNF & RW management

Volumes of solid radioactive waste, both in storage and in final disposal

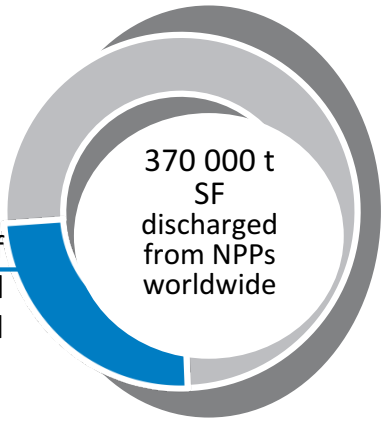


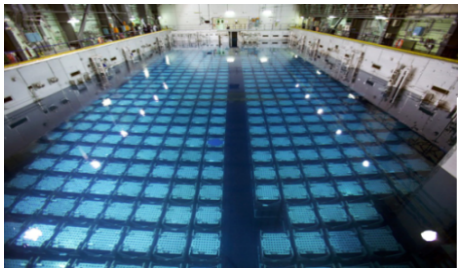


SNF accumulation worldwide

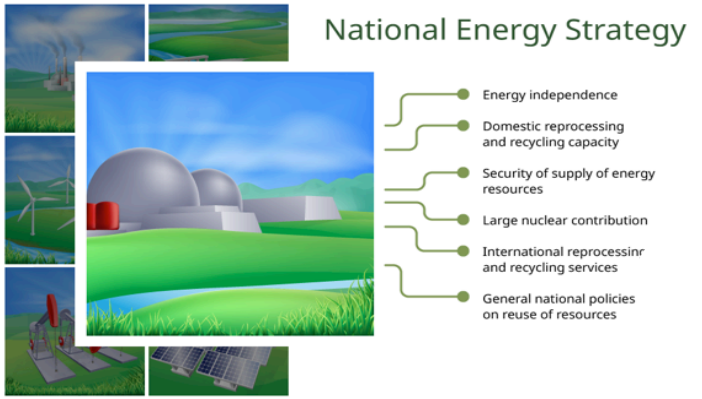
250 000 t of SNF in storage

120 000 t of reprocessed spent fuel





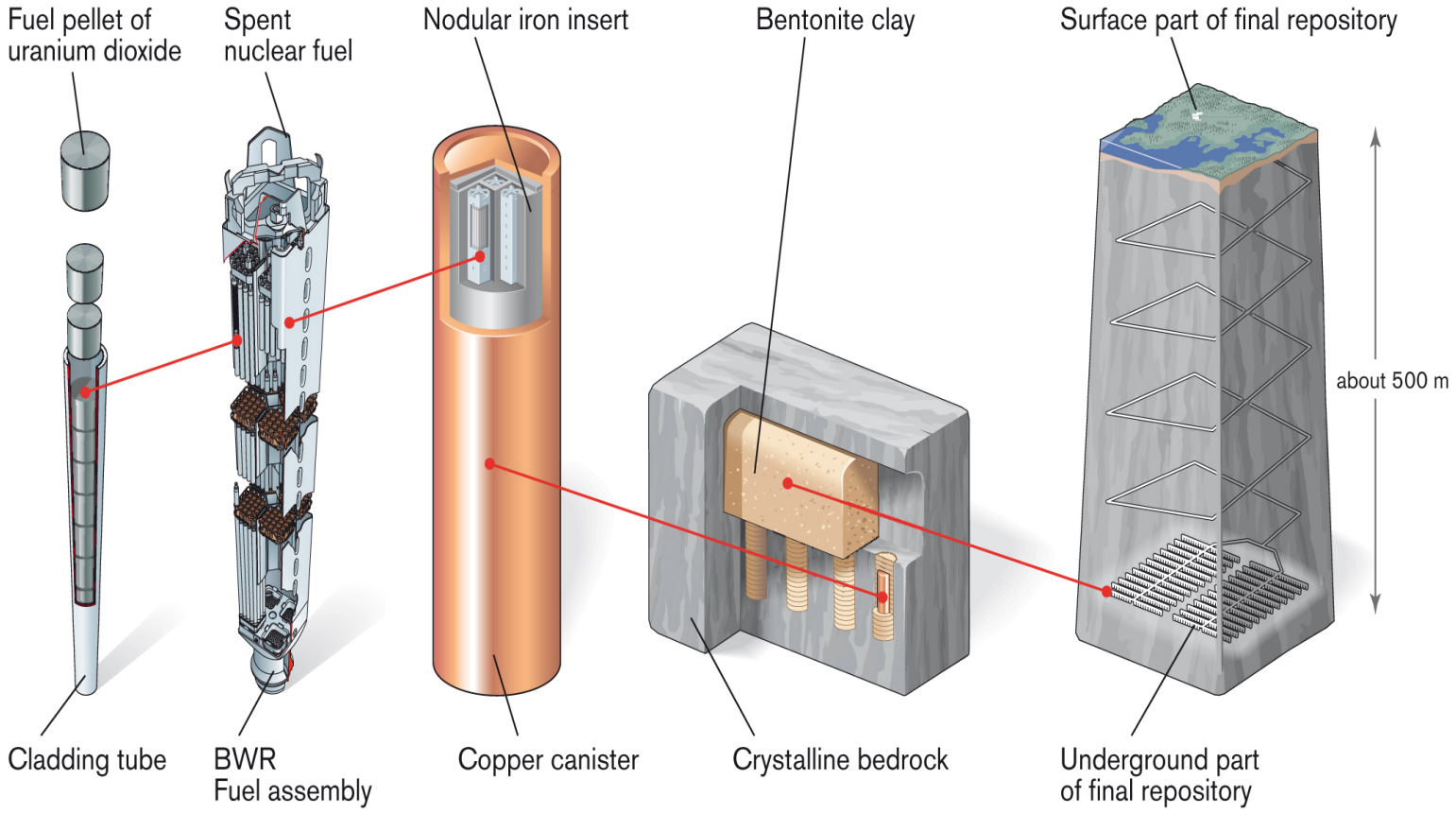
Is the spent nuclear fuel a resource or a waste? Strategic options



SNF Direct disposal

SNF is stored for several decades and disposed in a geologic repository

Finland, Sweden, USA, Canada, Germany

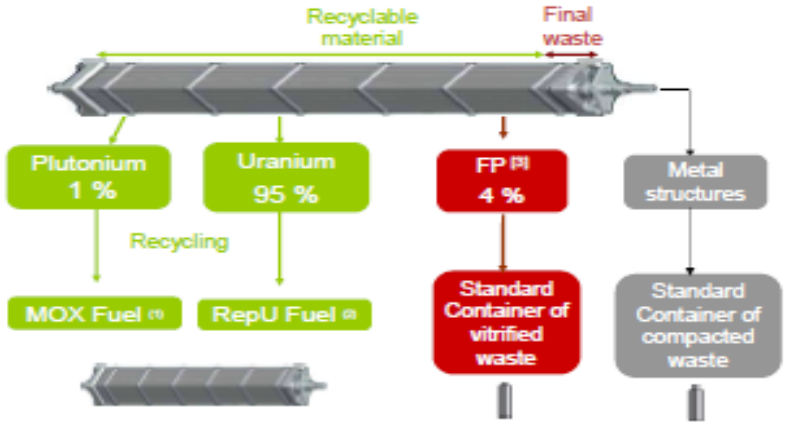


Reprocessing& Recycling today

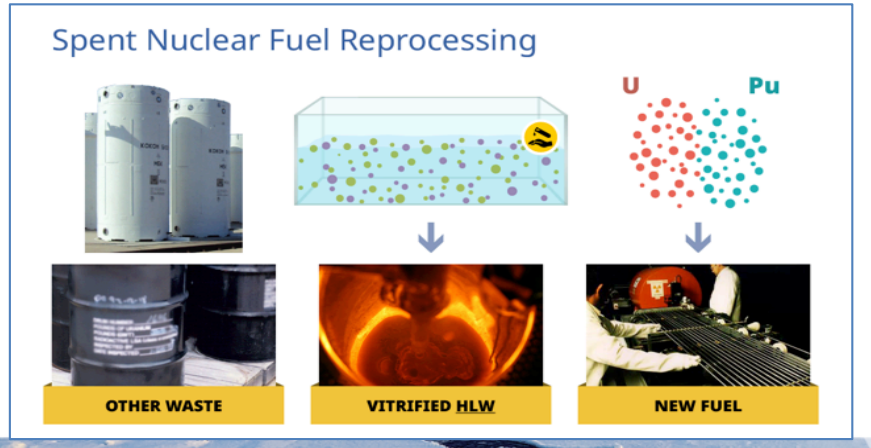
Reprocessing/Recycling – SNF is reprocessed, U and Pu reused as fuel in light water reactors or fast reactors – high level waste disposed in a geologic repository

France, Russia, Japan, India and China (countries with large and ambitions nuclear power programmes)

Monorecycling today - MOX and repU fuel (up to 25% saving of nat U)



World Map of MOX Fuel users



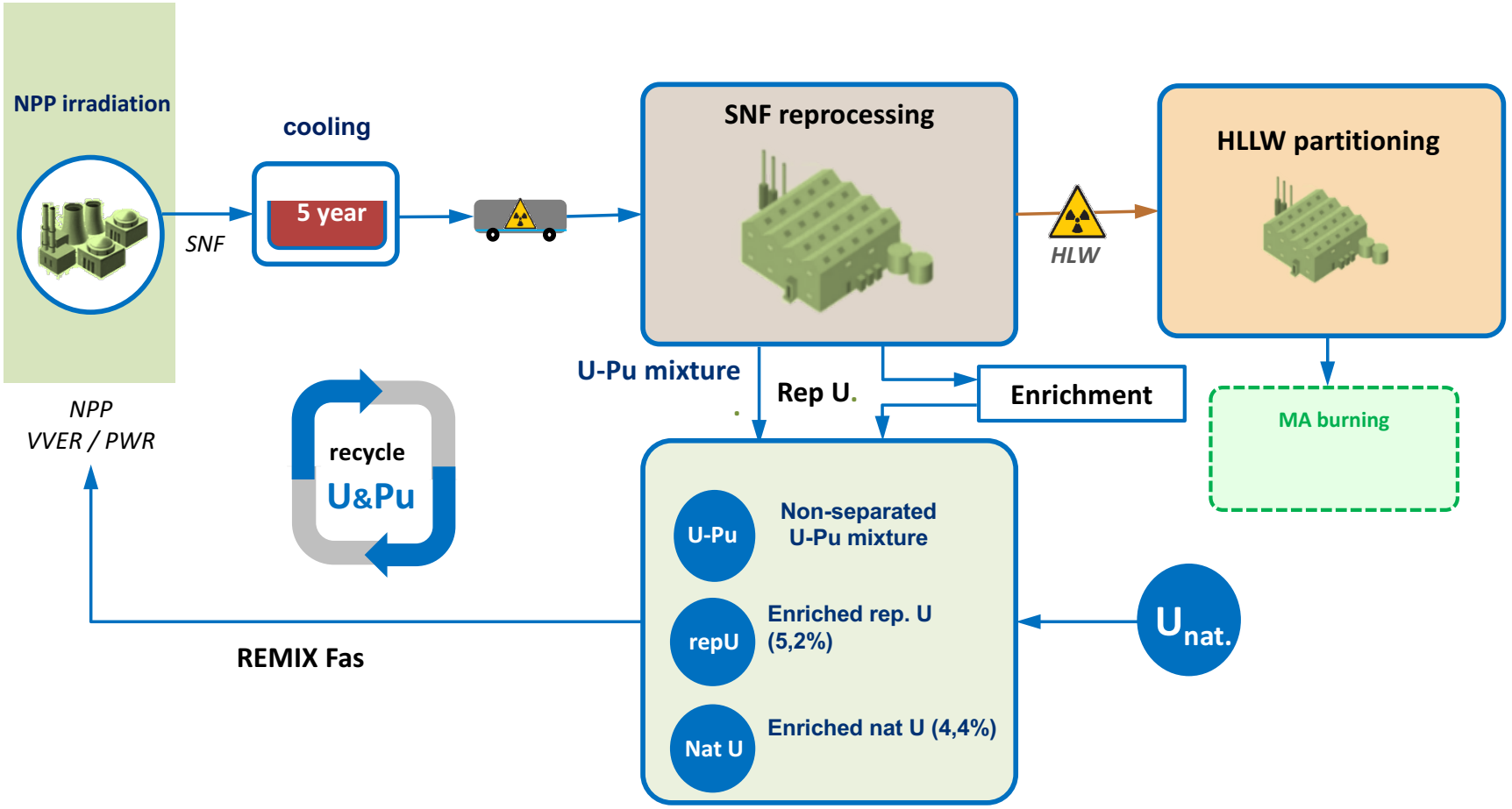
World Map of repU Fuel users

Slide have been inspired in the e-learning material on SFM currently under development in the IAEA (NE department)

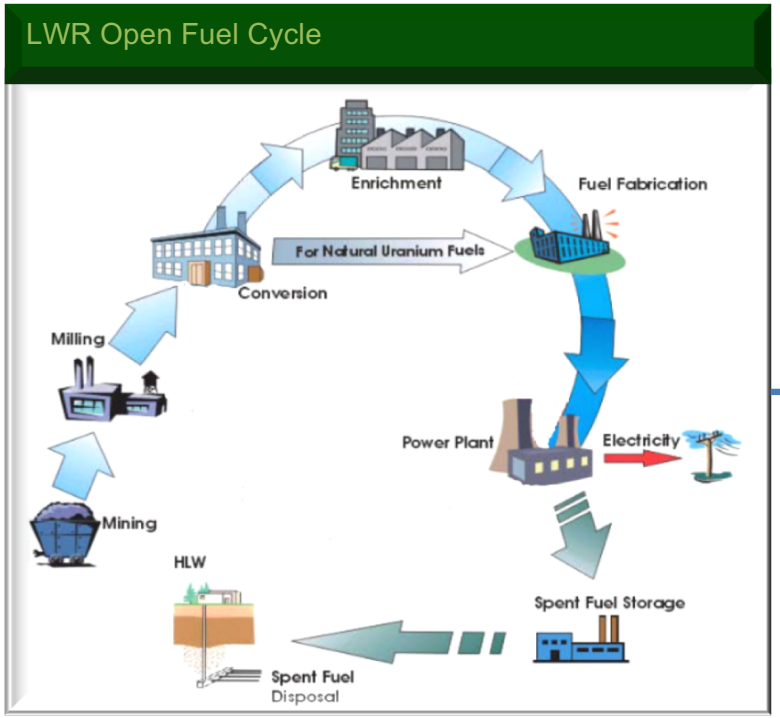
REMIX fuel – U& Pu multi - recycling in LWR reactors

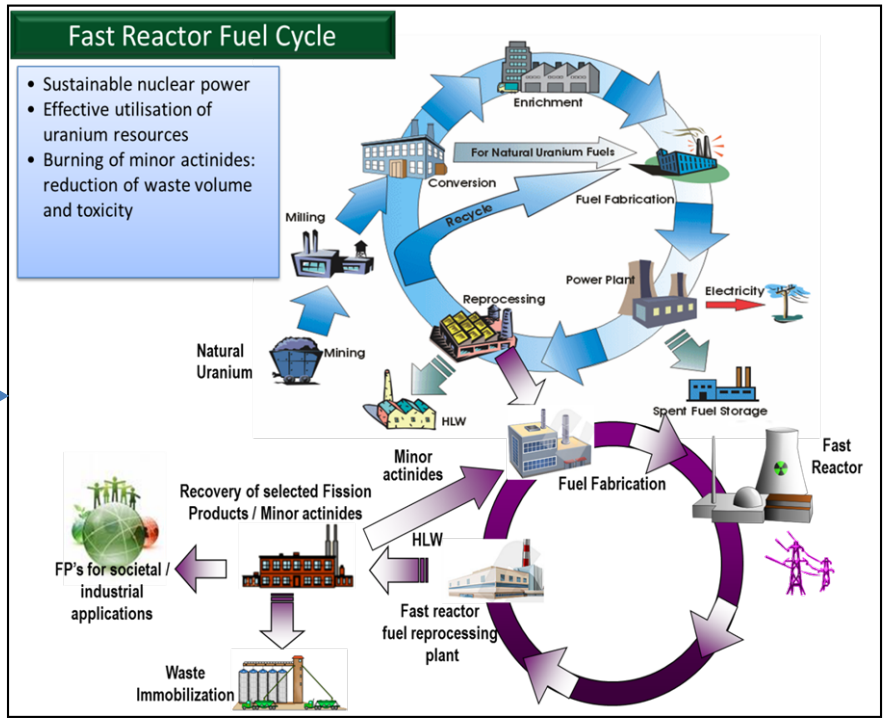
REMIX fuel is the mixture of U and Pu from LWR SNF reprocessing, with the addition of enriched uranium (natural or rep. U) .

REMIX fuel enables multiple recycling of the entire quantity of U and Pu from SNF, with the 100% core charge and 20%- saving of natural uranium in each cycle.



Advanced Fuel Cycles





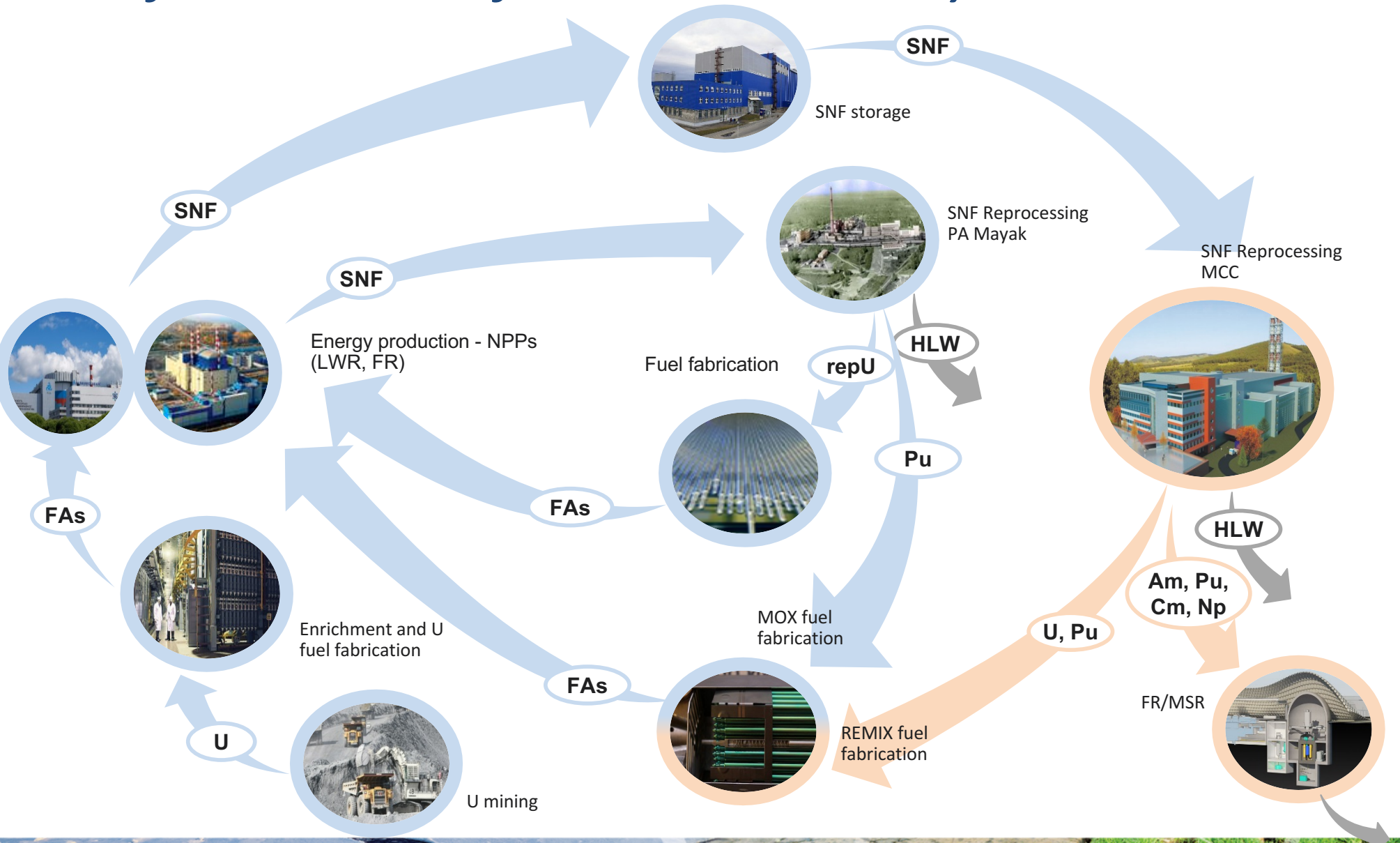
URANIUM DEMAND

Without recycling	100%
Recycling in light water reactors	75%
Recycling in fast reactors	5%

BN-800

Advanced nuclear system with LWR and FR , recycling U and Pu can provide long term (thousand of years) supply of low carbon electricity

Infrastructure of Advanced Fuel Cycles in Russia



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