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Recycling of nuclear waste
- A matter of technology only?

Photo courtesy Stock.XCHNG

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Technology utilisation - Public Acceptance

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Example -Fire

Pro

Technology

Countermeasure

Cons

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Example -Medicine

Pro

Technology

Cons

Countermeasure

?

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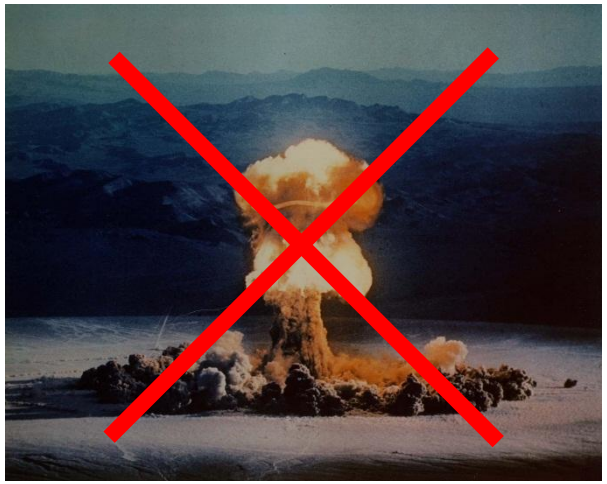
Example –Energy

Pro

Technology

Cons



A smarter and more efficient nuclear technology forms a basis for mitigating nuclear proliferation

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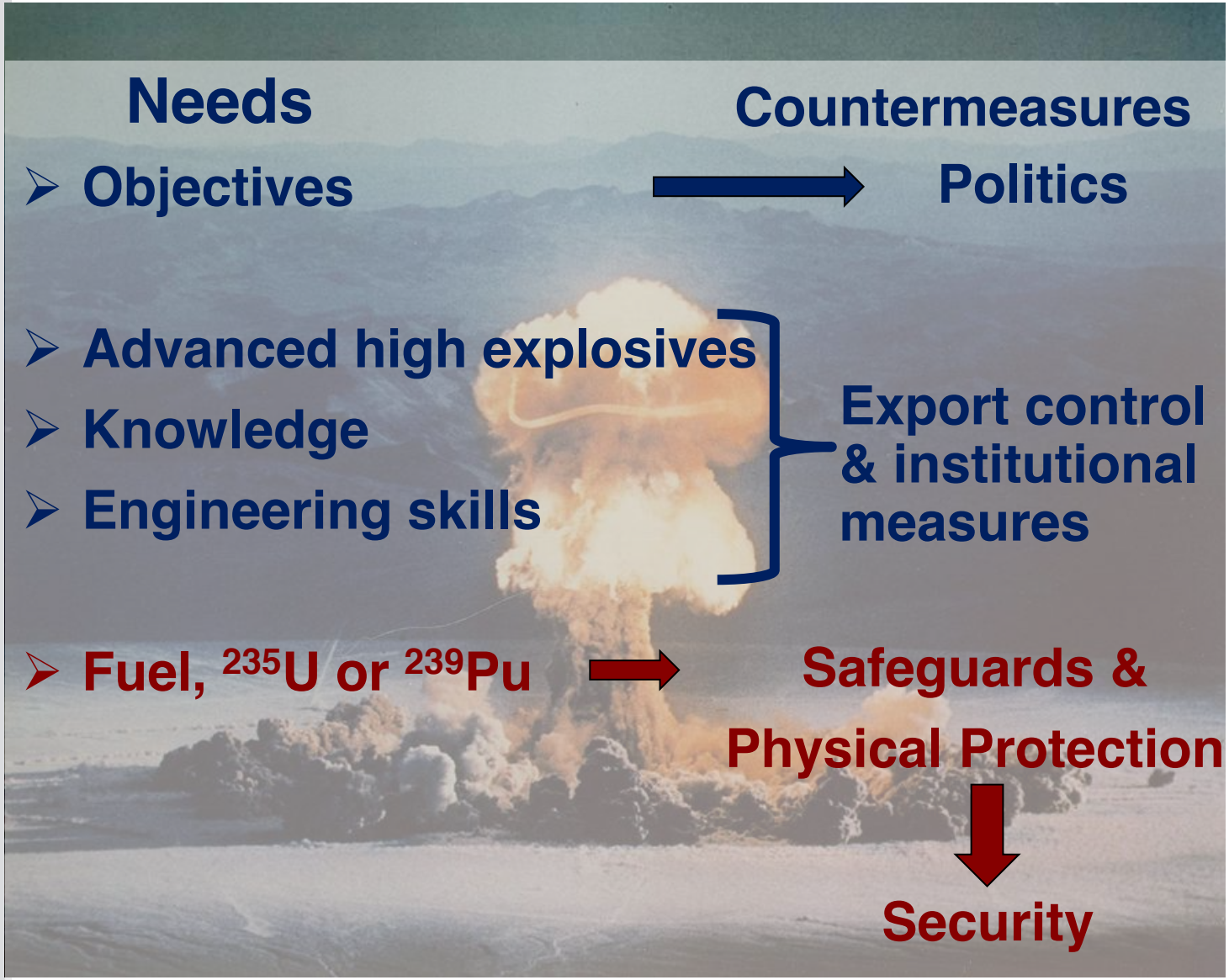
What do I need to build a NED?



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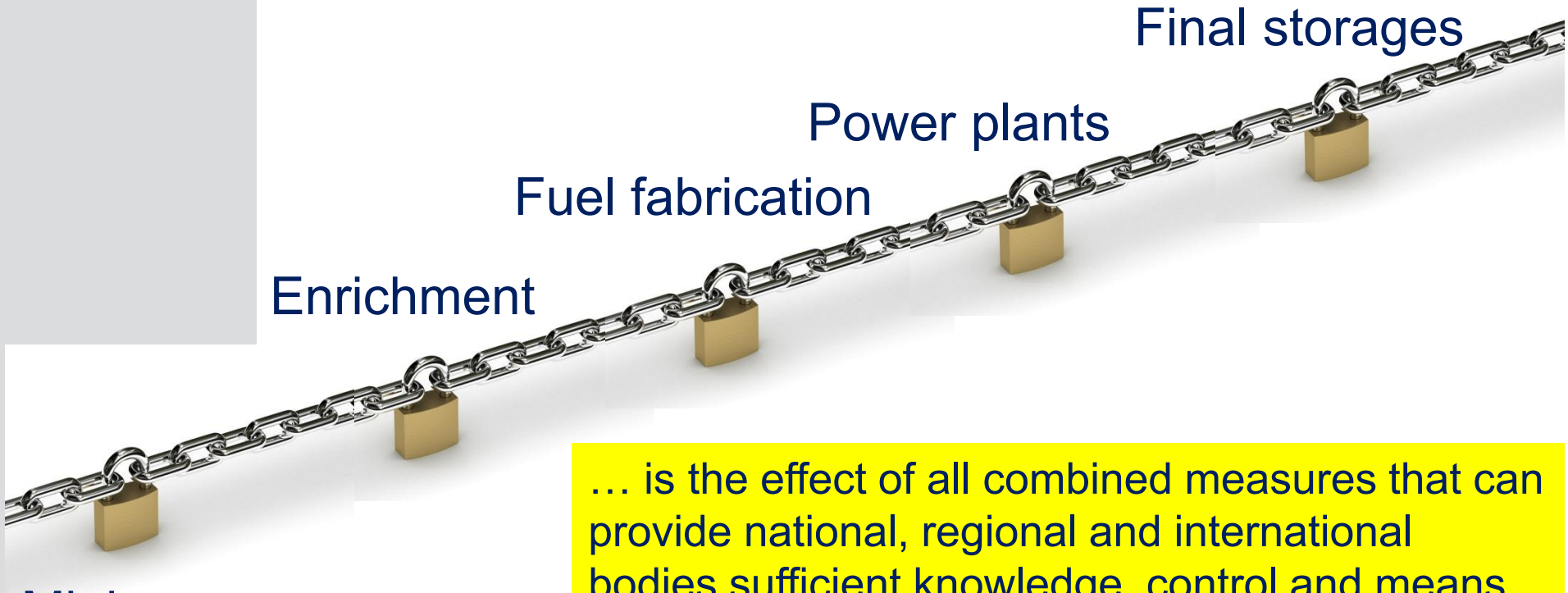
Security…



… is the effect of all combined measures that can provide national, regional and international bodies sufficient knowledge, control and means to prevent any antagonistic action against the nuclear system or diversion of nuclear material

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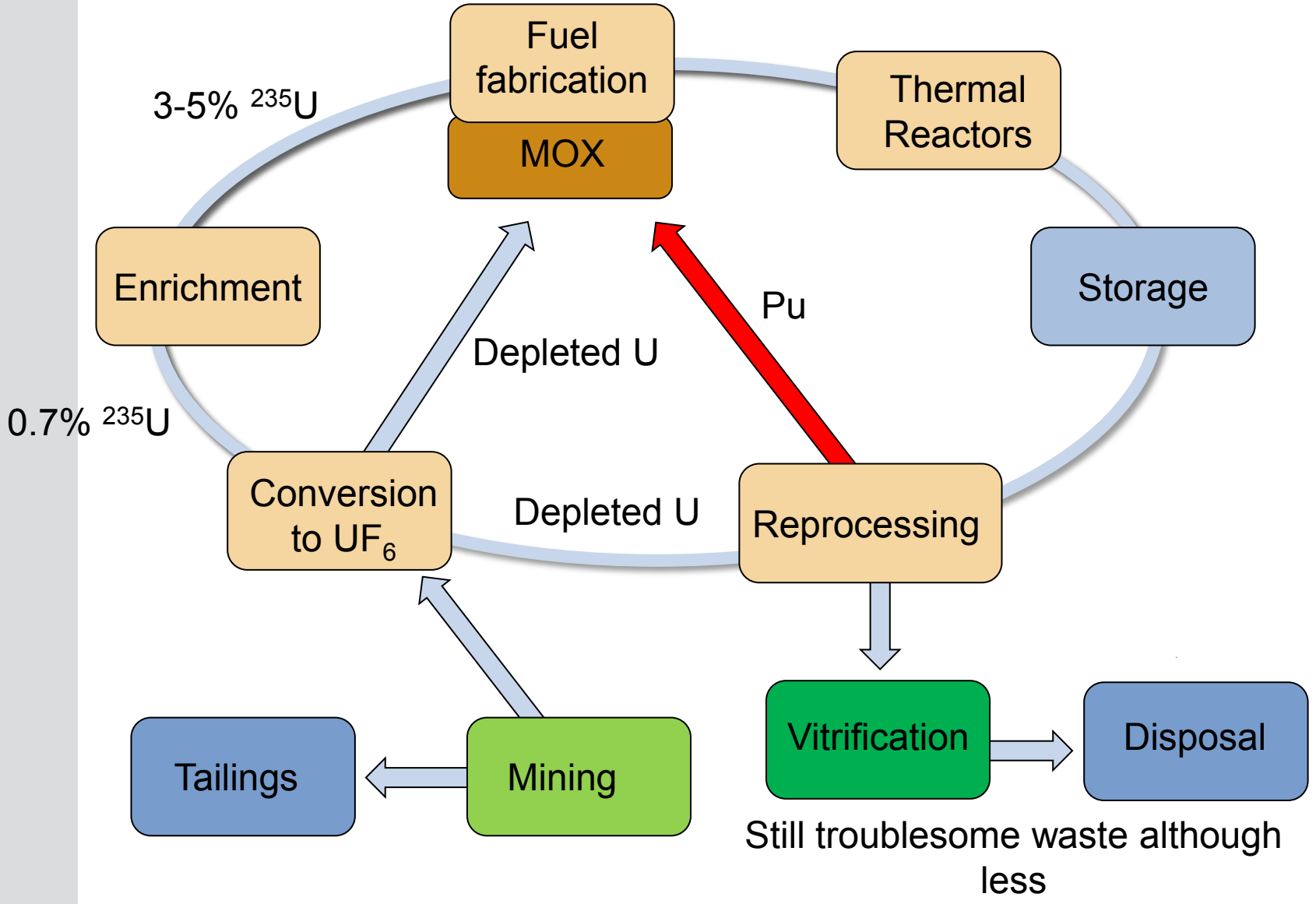
The Nuclear Fuel Cycle today



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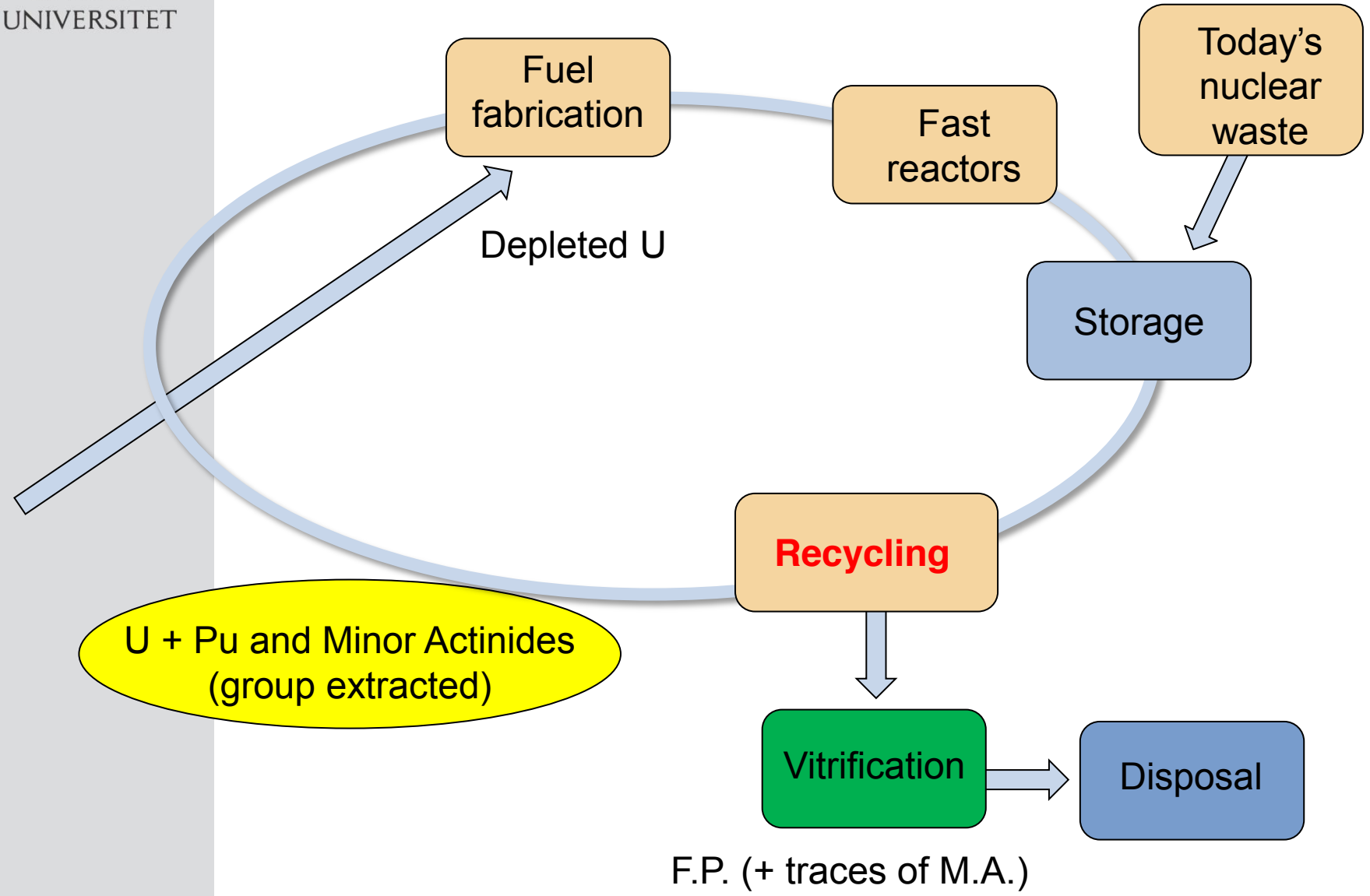
Gen IV Nuclear Fuel Cycle



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Why recycling?

Several advantages when included in a system of fast reactors:

- In the order of 100 times better energy utilisation of natural resources
- No enrichment needed
- Reducing the radio-toxic inventory => reducing storage time in the order of 100 times
- Negligible amount of fissile material in the waste
- Use today's nuclear waste as fuel

Makes N.P. to comply well with the Brundtland Commission's definition of sustainability

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Concepts vs. Aspects

	KBS-3	Deep boreholes	Recycling + "KBS-3"	Salt mines
Long-term security	3	4	5	3
Long-term safety	5	?	5	4
Economics	5	2	3 (5) [1]	5
Environmental impact	5	?	5	3
Public acceptance	3	?	4	3
Average	**4.2**	**3 ???**	**4.4 (4.8) [1]**	**3.6**

1. Fully deployed (no enrichment necessary and little need for mining)

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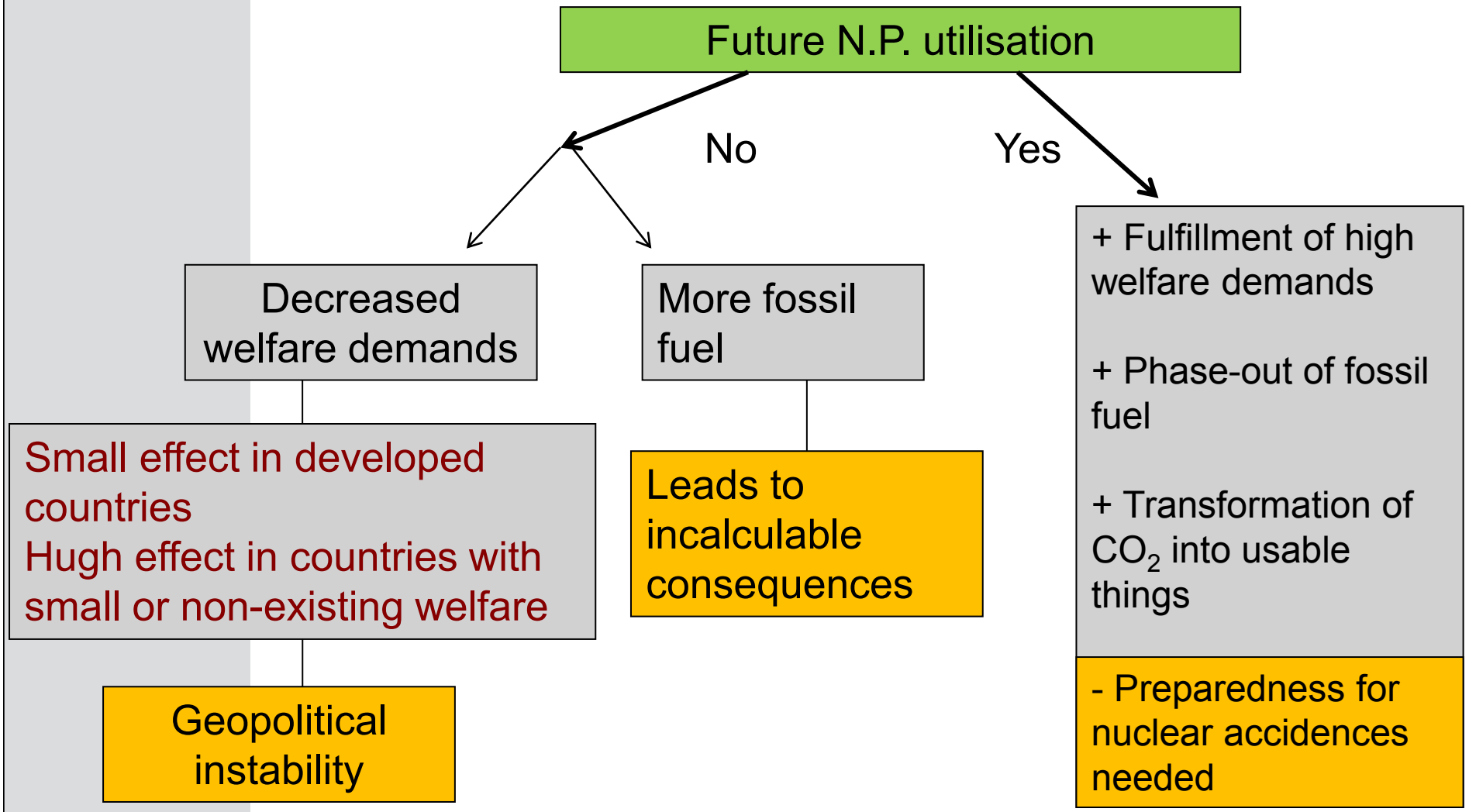
Future N.P. utilisation –Yes or No?

More a political issue than a technical one



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Future N.P. utilisation –Yes or No?

	KBS-3	Deep boreholes	Recycling + ”KBS-3”	Salt mines
No future N.P. utilisation	4	5	2	3
Future N.P. utilisation	2	1	5	3

Grand total	**4.2**	**3.7 ???**	**4.3** [1]	**3.5**
	3.8	**2.3 ???**	**4.8** [1]	**3.5**

1. Fully deployed

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So, how to proceed?

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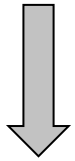
Public acceptance…

…basically **non-technica**l issues and their **technical** solutions e.g.:

- Security (short-term & long-term) ?
- Sustainability ?
- Higher operational safety in all parts of the fuel cycle ?
- Relatively simple and autonomous technology ?



Recycling together with fast reactors and adequate final repositories ⇔ Generation IV