

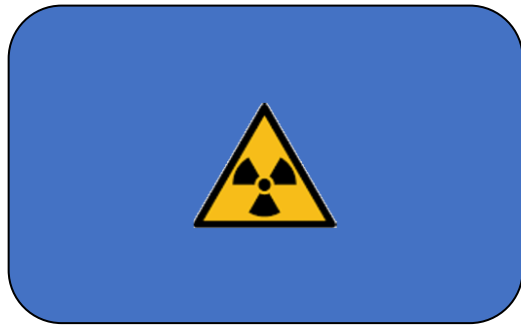
# **VLLW in Germany – Clearance, reuse or Radioactive Waste Disposal? + Discussion**

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# Clearance - Concept

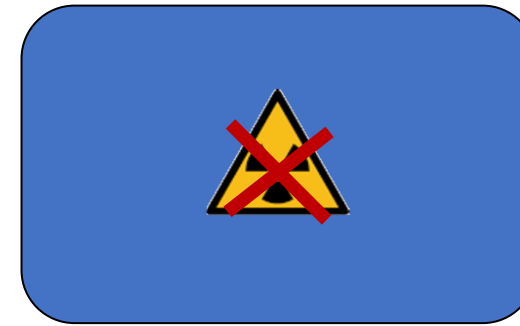
substances of **minor** radioactivity  
**under supervision** of the  
competent authority



10  $\mu$ Sv concept  
clearance procedure

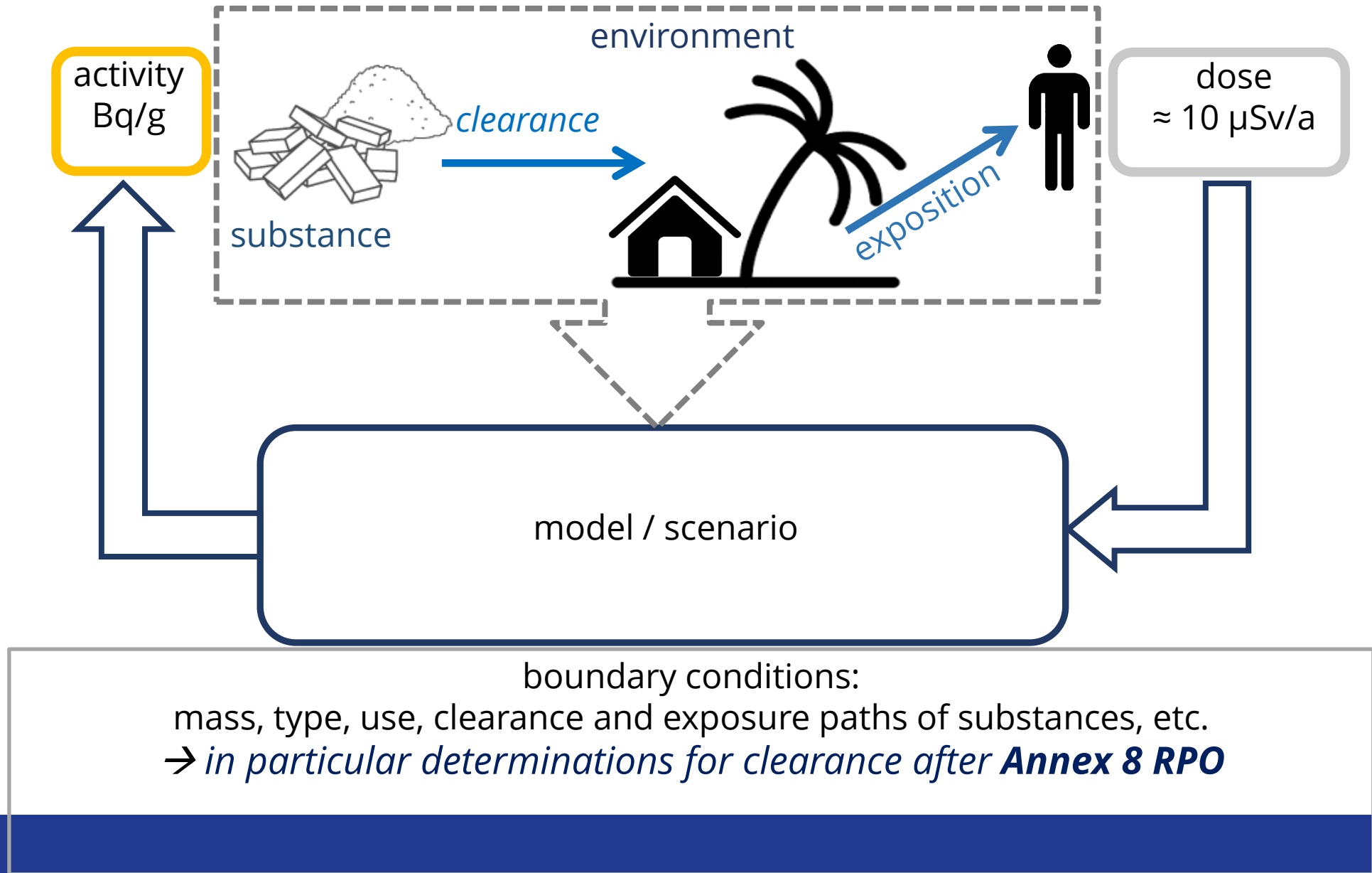
administrative  
act

the **same substances**  
of minor radioactivity  
**released from supervision**



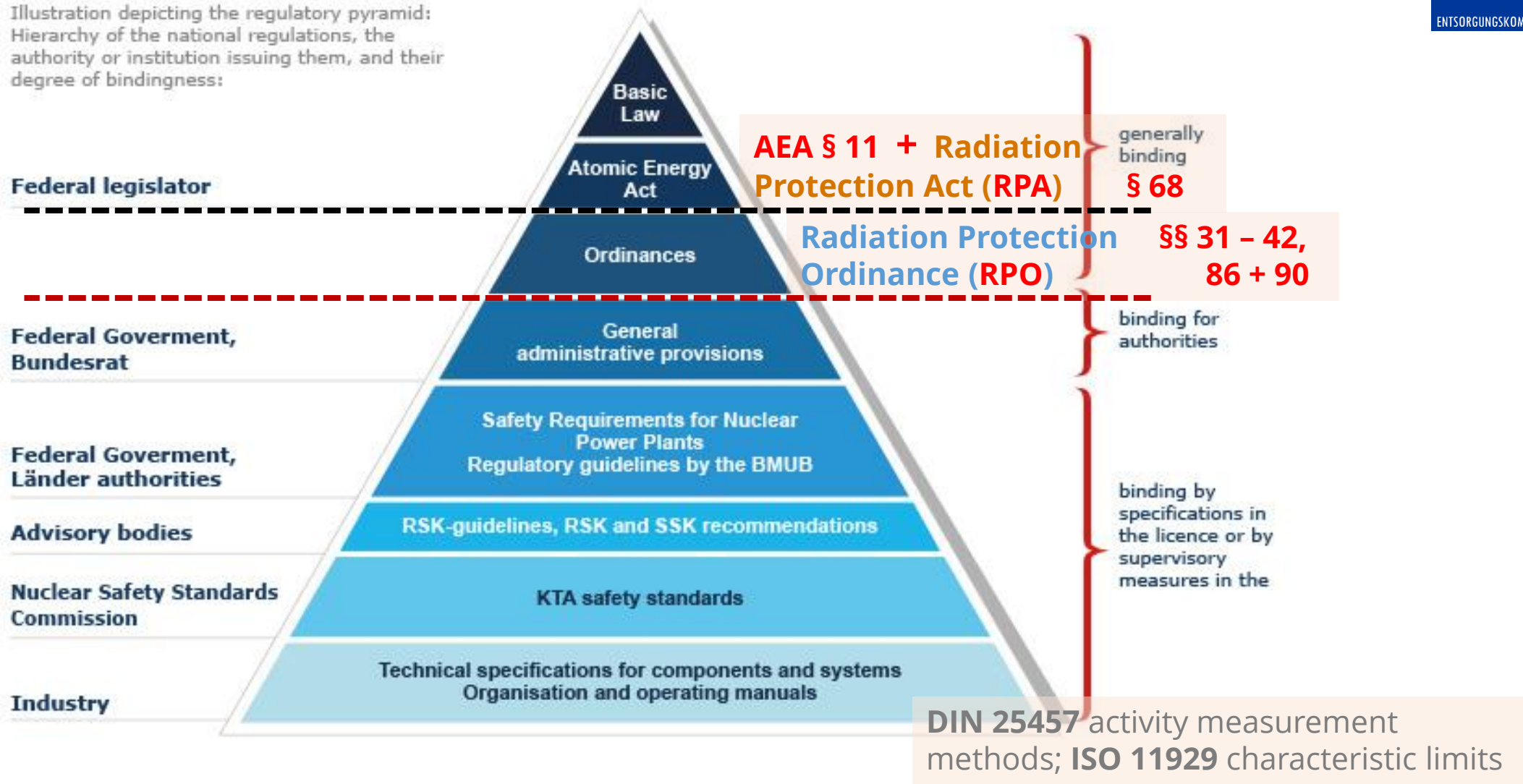
- substances of minor radioactivity are radiologically harmless
- → no radiological need of nuclear supervision
- → activity can be disregarded
- clearance as an administrative act guarantees, that only harmless substances are released from supervision
- → cleared substances are no longer radioactive substances (... by law)

# Clearance Models

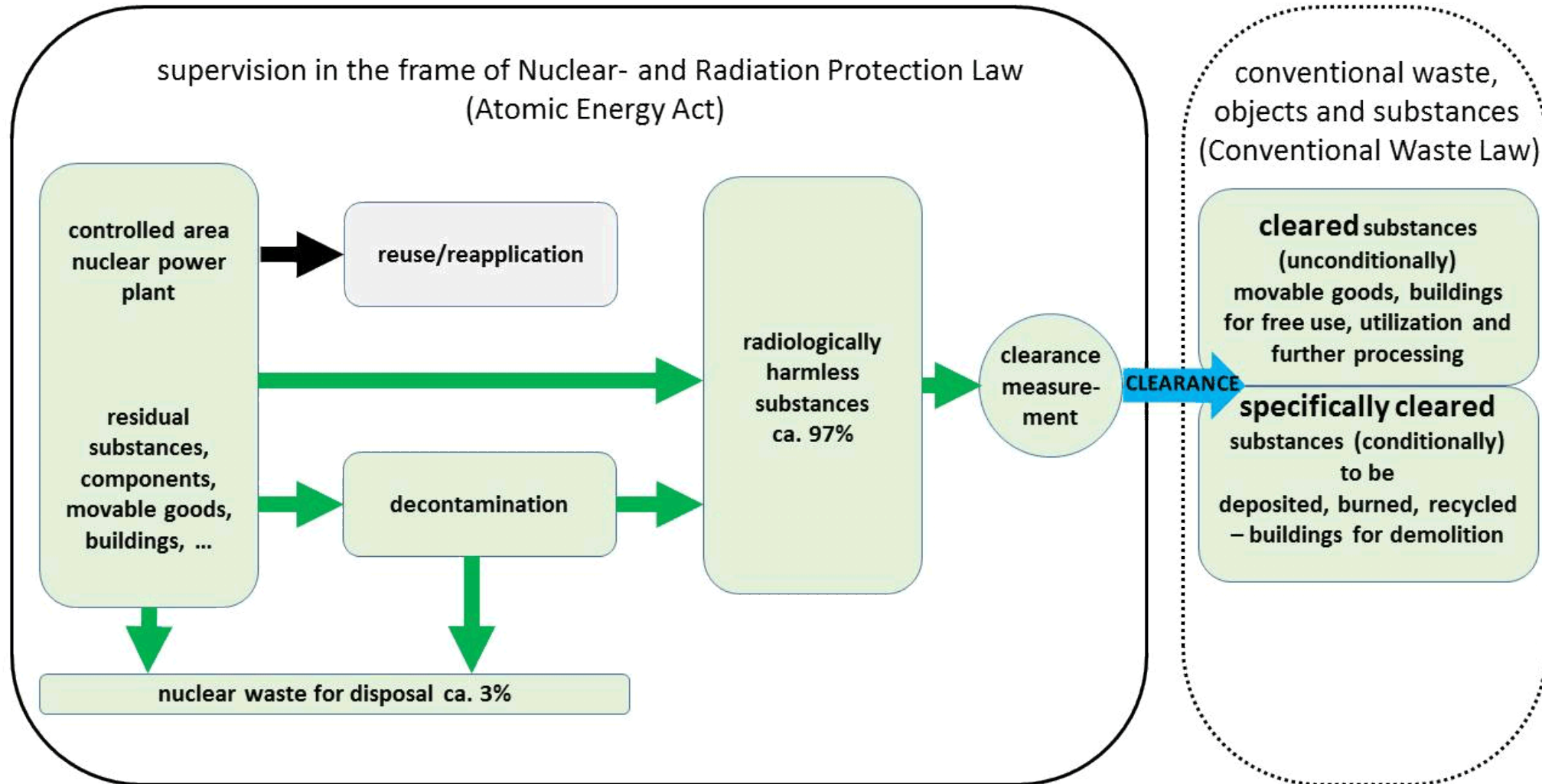


# Clearance in Germany - Legal System -

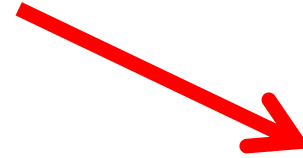
Illustration depicting the regulatory pyramid:  
Hierarchy of the national regulations, the authority or institution issuing them, and their degree of bindingness:



# How it works - clearance of marginally contaminated substances



# Scrap Metal



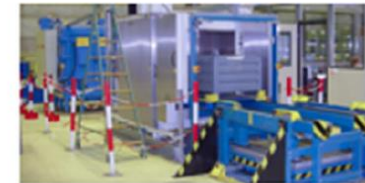
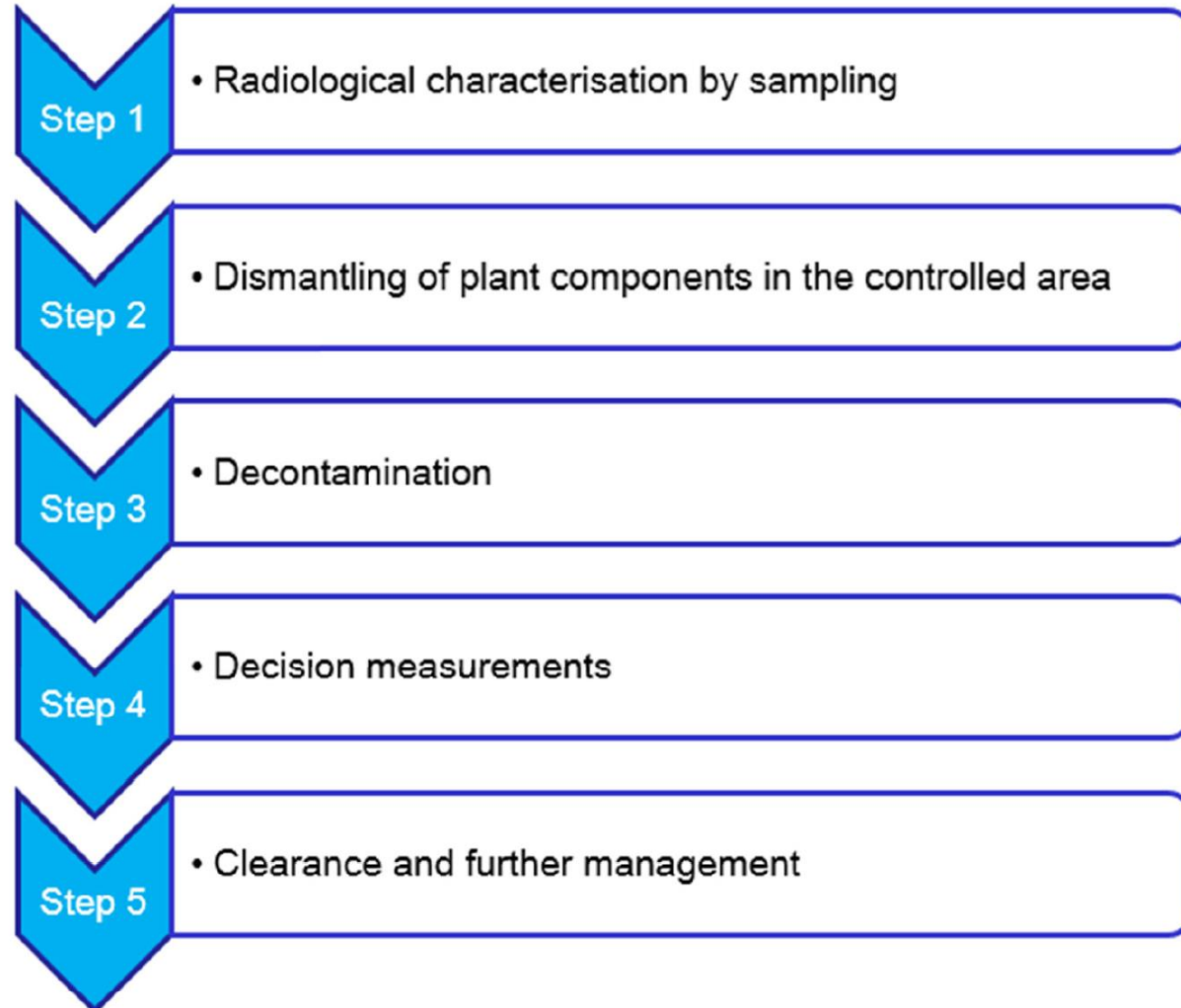
## Conventional Melting

- without license after AEA
- **only cleared substances**
- conditions:
  - melting ratio 1:10*or*
  - capacity of melting facility at least 40000 Mg/y

## „Nuclear“ Melting

- with license under supervision
- low to mid contaminated/activated substances
- products to be used under supervision
- decontamination/activity reduction by melting
- **clearance** of a smaller fraction **after melting**

# (Technical) Clearance procedure in Germany



# Clearance of Buildings



Figure 6:  
Room to be measured for clearance with  
sampling points  
(PreussenElektra GmbH, Würgassen  
nuclear power plant)

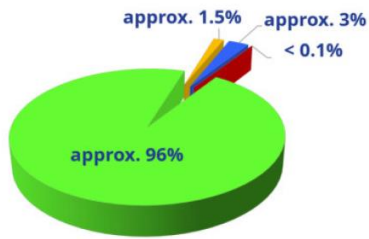


Figure 10: In-situ gamma spectrometer for decision measurements of buildings  
(Brenk Systemplanung GmbH)

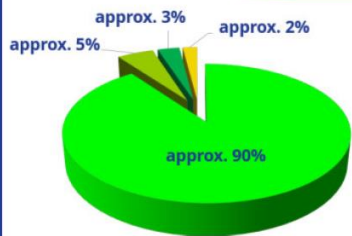
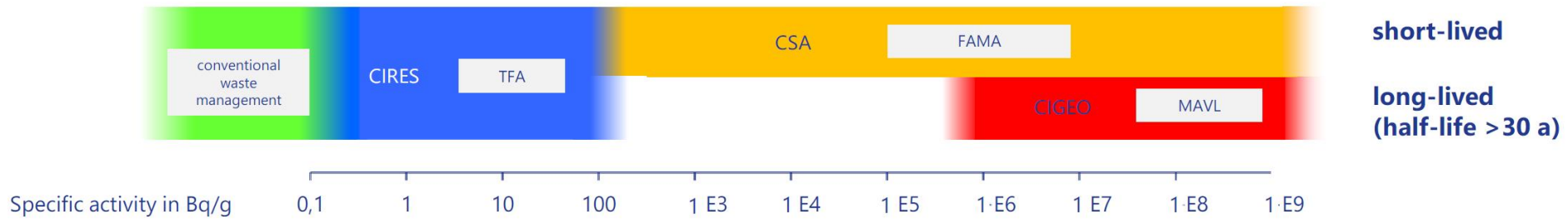


# ESK-comparison France vs. Germany for VLLW, LLW and ILW

## Material flows in waste management and their classification



### France



### Germany



# Conclusion

- Only a very small fraction of the material from the dismantling of German NPP is Radioactive Waste, clearance is the main disposal / reuse pathway.
- Clearance is an administrative act for materials with negligible radioactivity (effective dose for individuals  $< 10 \mu\text{Sv/y}$ ).
- Other pathways are reuse / „conventional“ and „nuclear“ melting and Radioactive Waste Disposal.
- French „conventional waste management“ in NPP is somewhat comparable to German Clearance of buildings.
- In Germany we have regulations for specific clearance e. g. incineration, disposal in conventional landfills or „conventional melting“ for material that is disposed of as VLLW (TFA) in France.