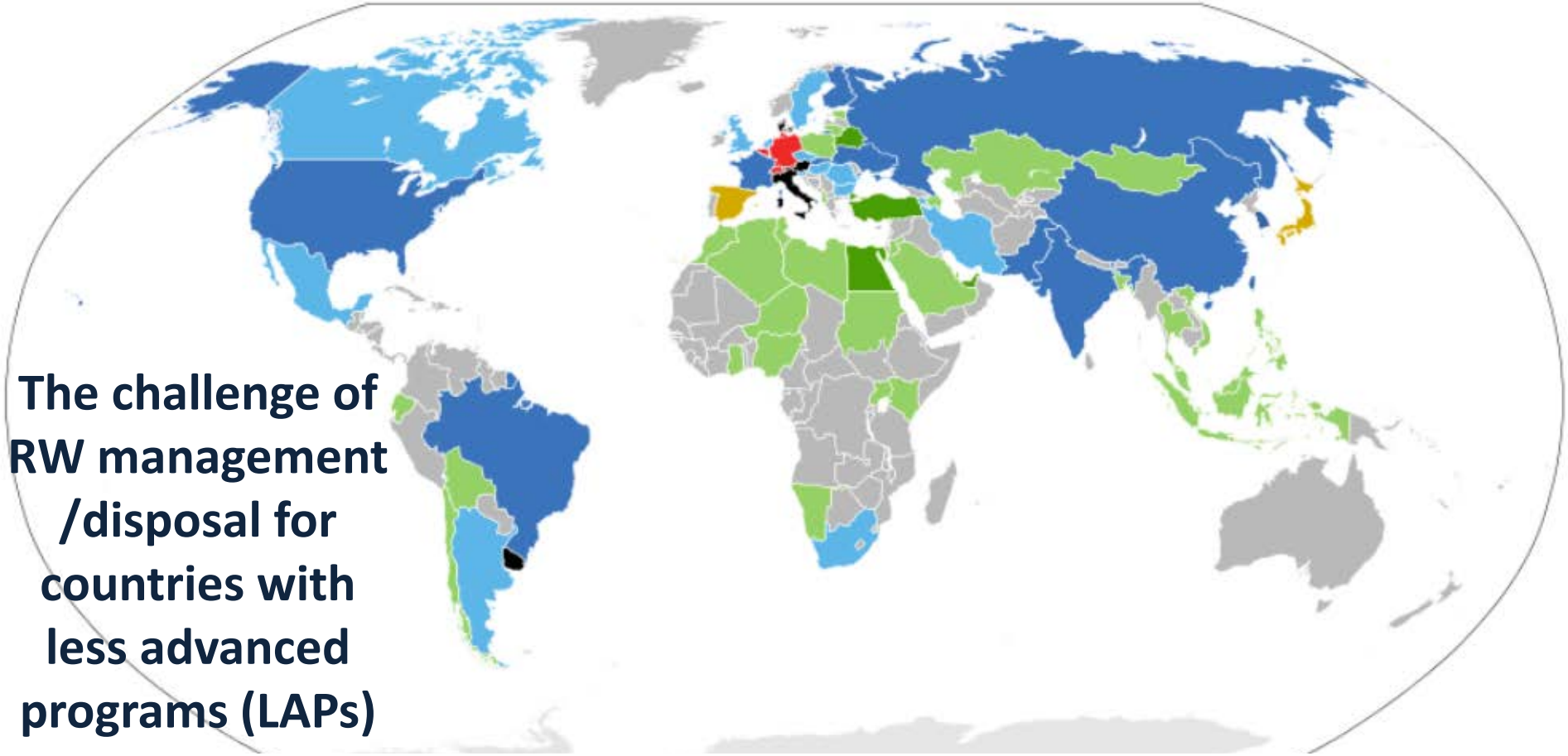
Research Projects in Radioactive Waste Management for Countries without NPPs

Nuclear power plants are located in 30 countries

Research reactors are located in 71 countries

The challenge of RW management /disposal for countries with less advanced programs (LAPs)



Global status of nuclear deployment as of 2009 *(source: see file description)* Operating reactors, building new reactors Operating reactors, planning new build No reactors, building new reactors No reactors, planning new build Operating reactors, stable Operating reactors, considering phase-out Civil nuclear power is illegal No reactors

Countries with small amounts of radioactive waste in Europe

with Research Reactors	without Research Reactors
Austria	Cyprus
Denmark	Estonia
Greece	Ireland
Latvia	Luxemburg
Poland	Malta
Portugal	

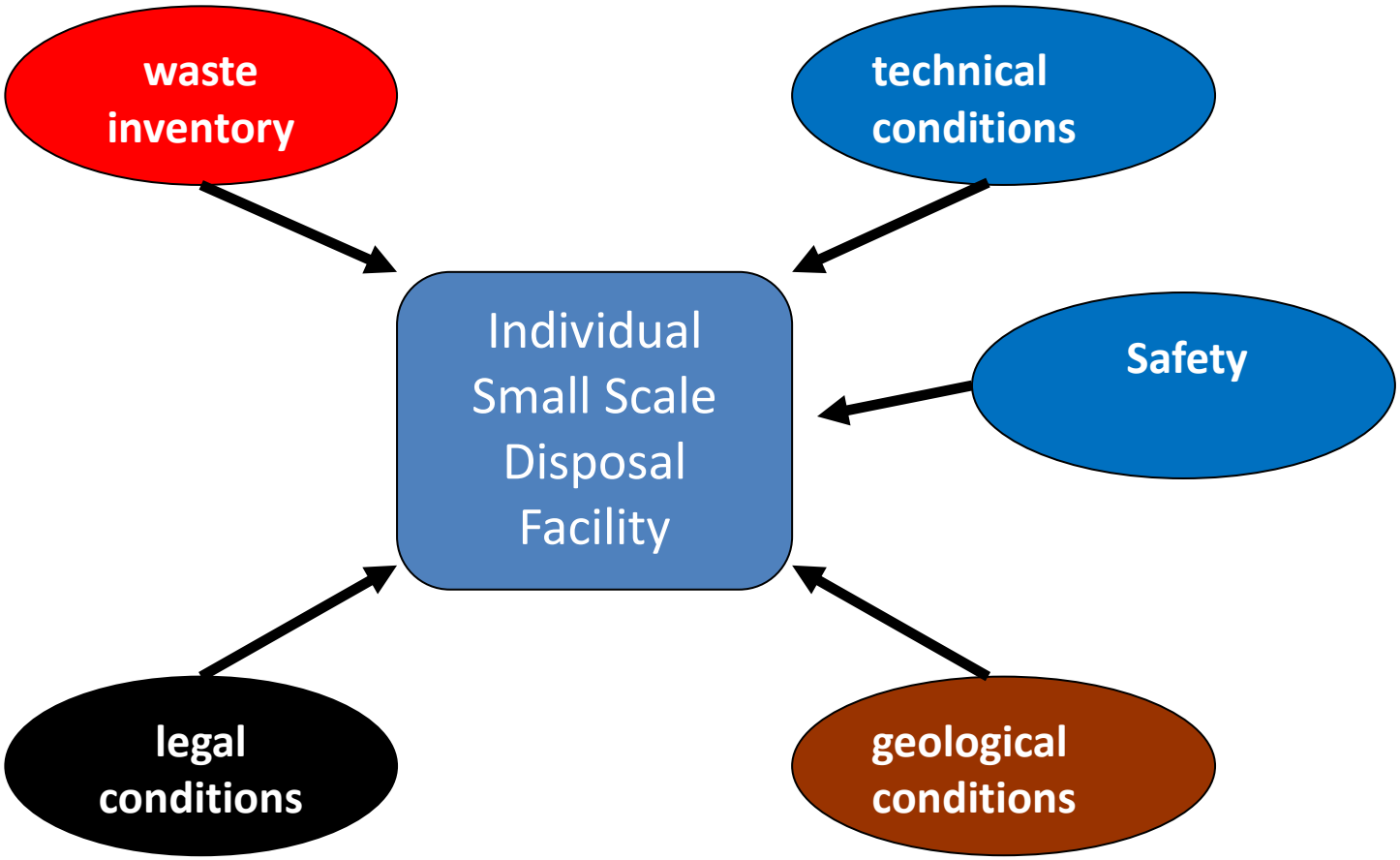
The European Council Directive 2011/71/Euratom requires all Member States to establish a national programme for the management and disposal of their radioactive waste

GR 2014 eu

EU Council WPAQ, 11 June 2014, "Common activities at EU level for RadWaste management". Key take-away messages:

- MS with small or no NPP programmes can best achieve this through intensive cooperaton;
- The EC could provide support to these MS to complement the support to the advanced nuclear programmes.

Small Scale Disposal Facility for LLW & ILW



Waste Inventory

- Often, countries have historical radioactive waste in raw form from past activities, without adequate information about the origin and the content of radionuclides (problem of characterization and segregation of the historical waste).
- The available technology for characterization is compatible for countries with large amounts of waste: existing technologies are not commensurate solutions for countries with small programme regarding the cost.
- The characterization and then segregation of raw historical waste may be more complicated for waste which has origin from research reactors than those from NPPs.

Suggestions (indicatively, non exclusively)

There is a research need for Greece and other EU MSs with small amounts of radioactive waste:

- to develop a reliable and cost affordable technology for cost effective characterization and segregation of historical preconditioned radioactive waste.
- to investigate credible ways for disposal of small amounts of LLW and ILW in boreholes with intermediate depth (offers the prospect of economic disposal on a small scale for solid radioactive waste not necessarily being sealed sources).

The perspective of Greece
…with respect to participating in the JP

- Joint Programming is a step towards homogeneity of European approaches

- Coordination of national research efforts
- Opportunities for collaboration
- Capacity strengthening
- Sharing of knowledge and technical expertise

- The benefits are mutually multiple for large and small countries
  - For example, in GR there is a significant amount of expertise and skills in scientific areas relevant to near field studies (simulation of transport processes-multiphase flow/diffussion/heat transfer and sorpion, system reliability and industrial safety, environmental impact assessment, radiological characterization, radiation protection).

The perspective of Greece
…how JP can help the national programme

- Joint Programming facilitates and supports the transposition of the RadWaste Directive (2011/71/Euratom).
- The disposal solution is a decisive parameter for the selection of treatment and conditioning techniques, as well as for the design.
- Without a convincing solution for disposal, we can not plan our national programme.
- For how long the waste will be stored? What specifications we really need for our storage facility? (cost for long term storage, problem of characterization and segregation of the historical waste).
- The added value of Joint Programming shall be communicated to promote public acceptance.