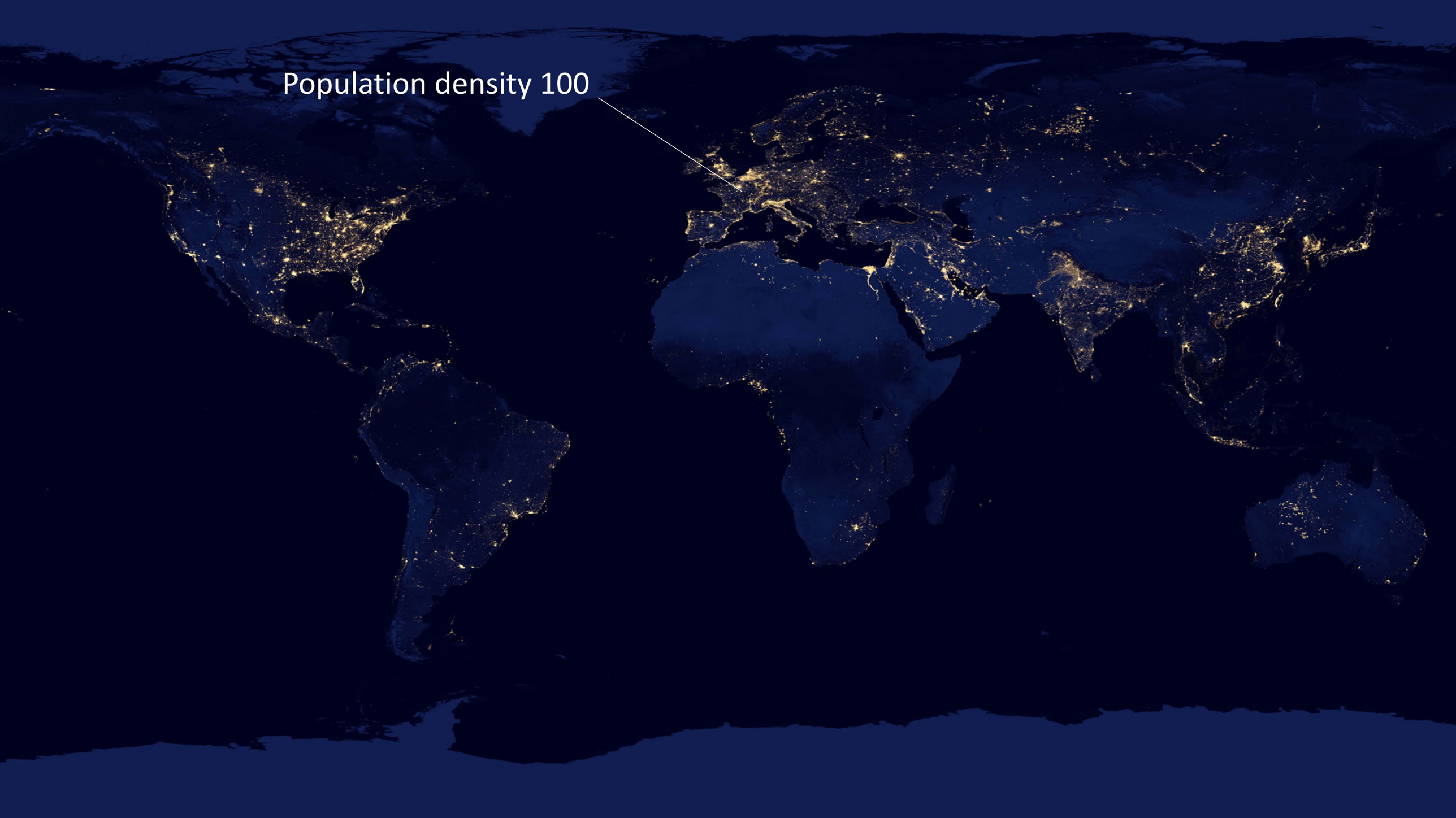
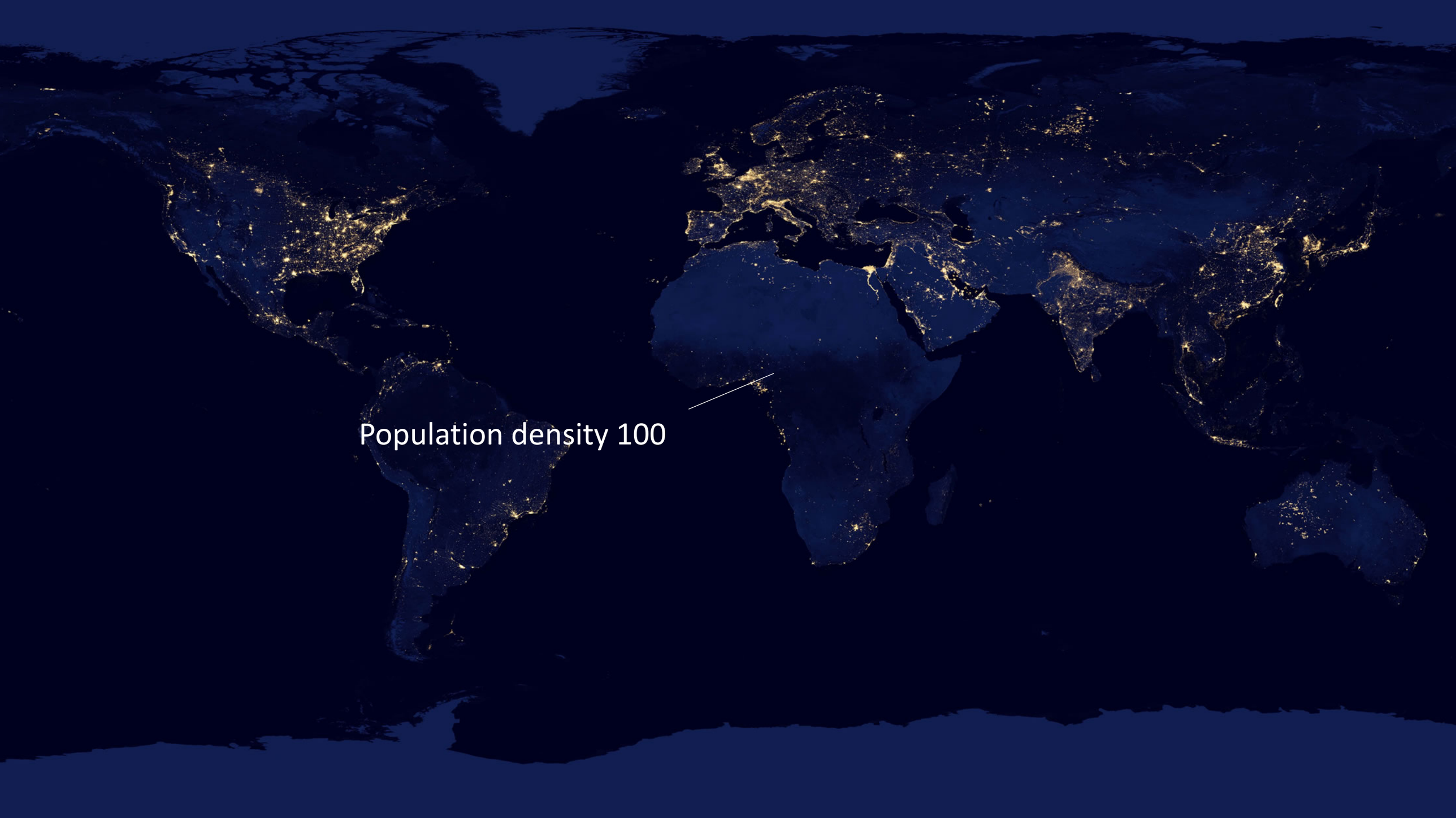
SEABORG

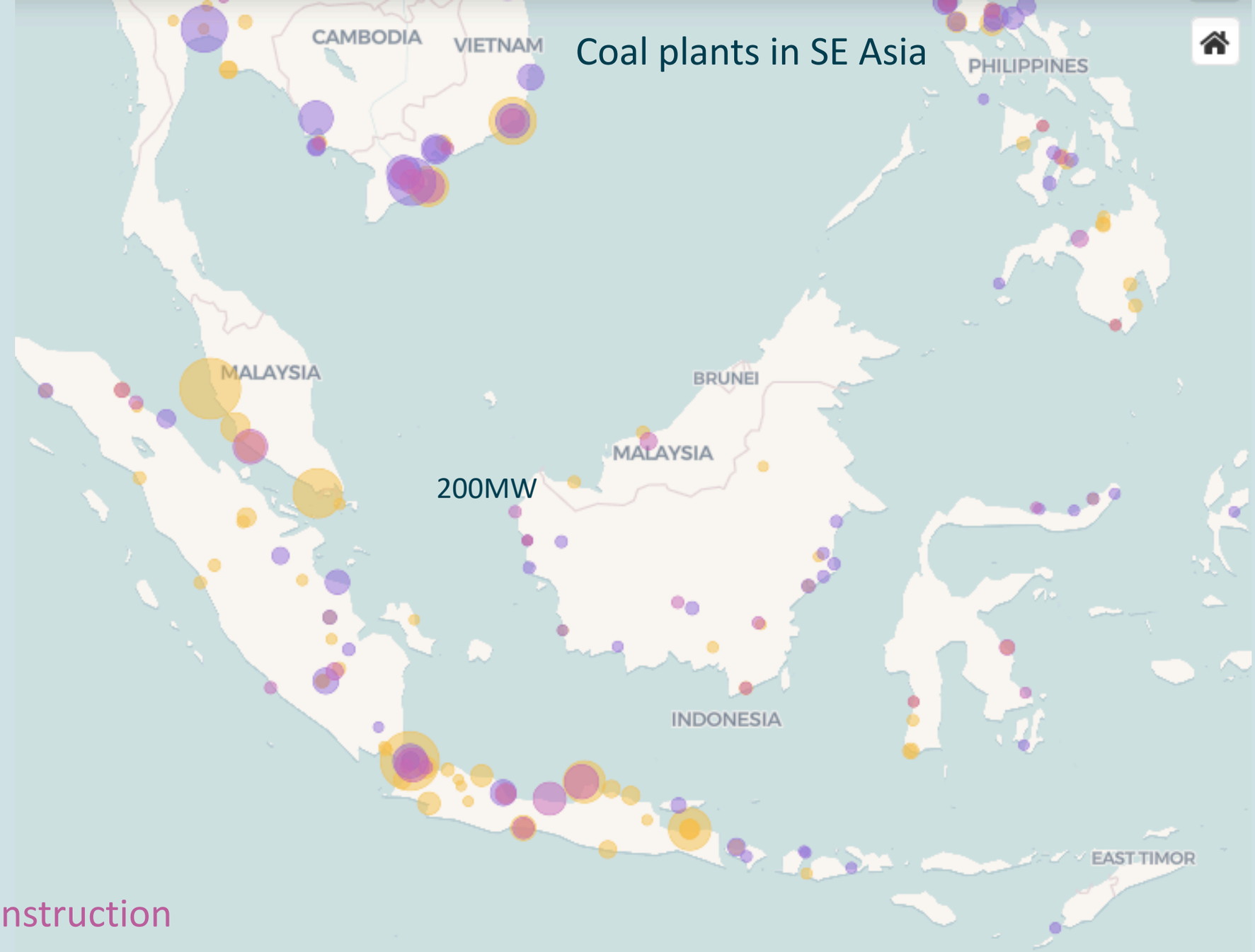
Rethinking nuclear

Ask Emil Løvschall-Jensen
aej@seaborg.co


Population density 100


Population density 100

Coal plants in SE Asia



200MW

Existing

Under construction

Planned

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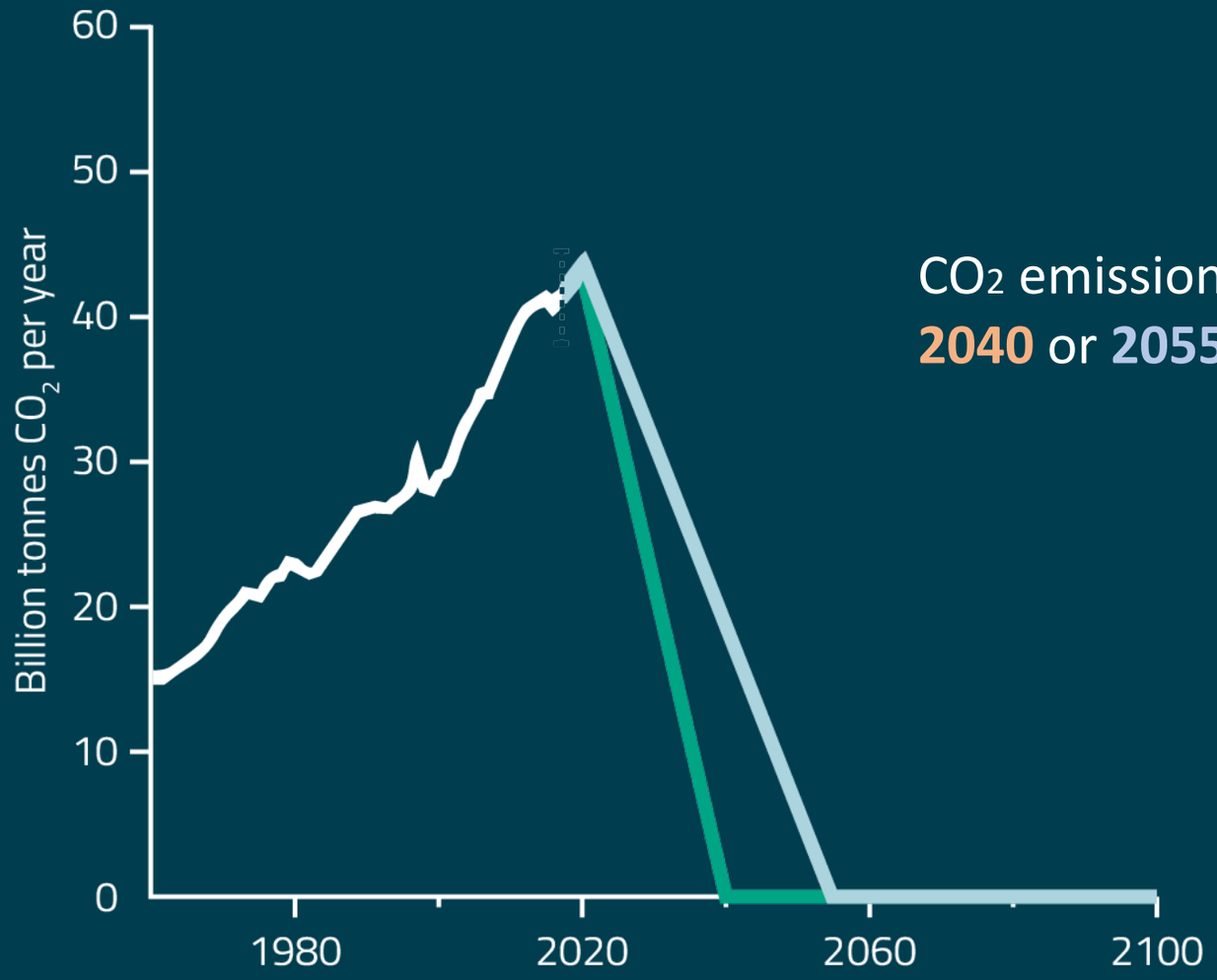


CO_2 emissions net zero in
2040 or **2055** (IPCC)

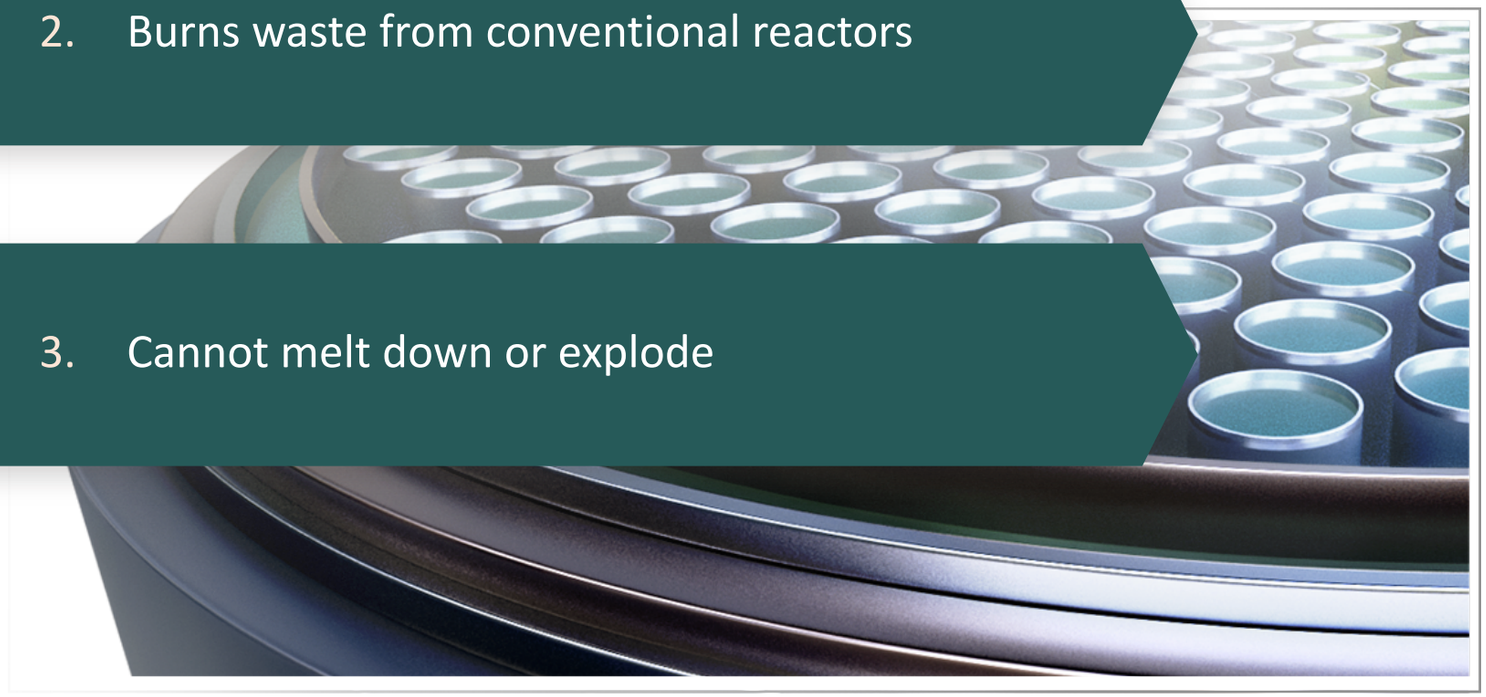
A reactor based on a molten fluoride salt

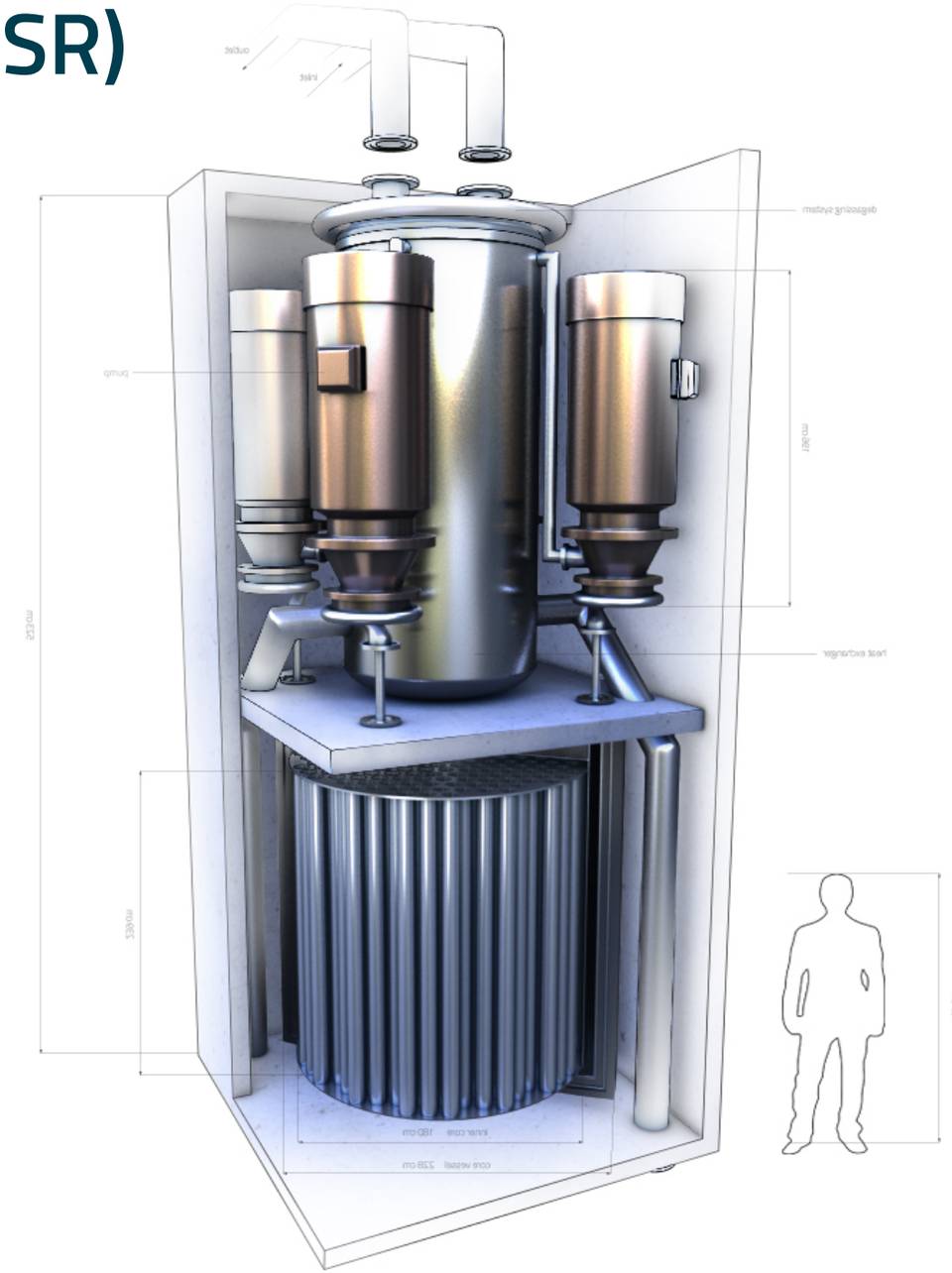
The Compact Molten Salt Reactor (CMSR)

1. Cannot be used for nuclear weapons

2. Burns waste from conventional reactors

3. Cannot melt down or explode





A reactor based on a molten fluoride salt

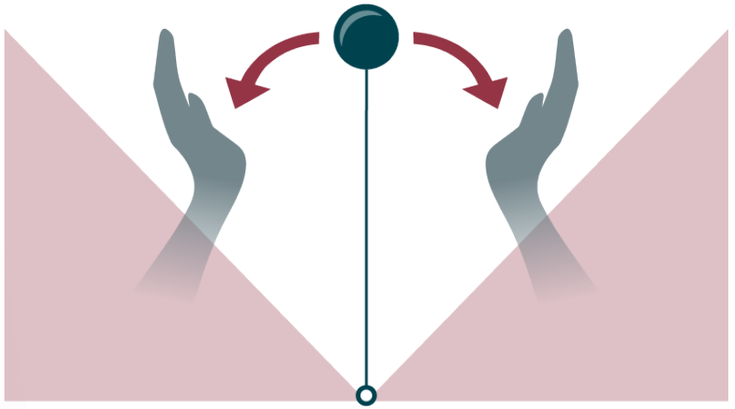
Reduces sources of failure and release mechanism

Eliminates dispersion mechanisms

Recycling spent fuel and flexibility to use Thorium

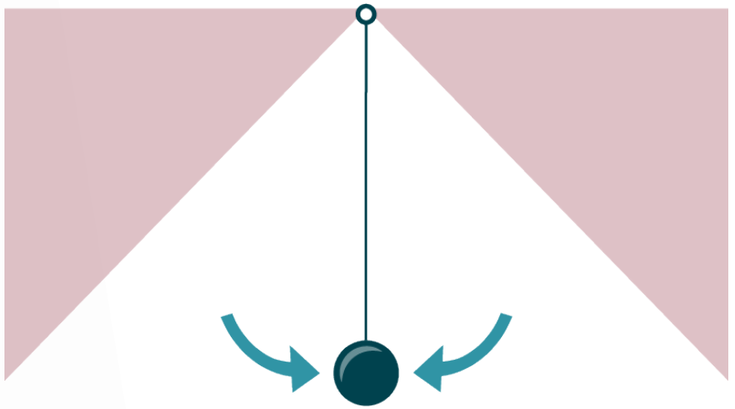
Conventional nuclear

Safety systems – safety by engineering

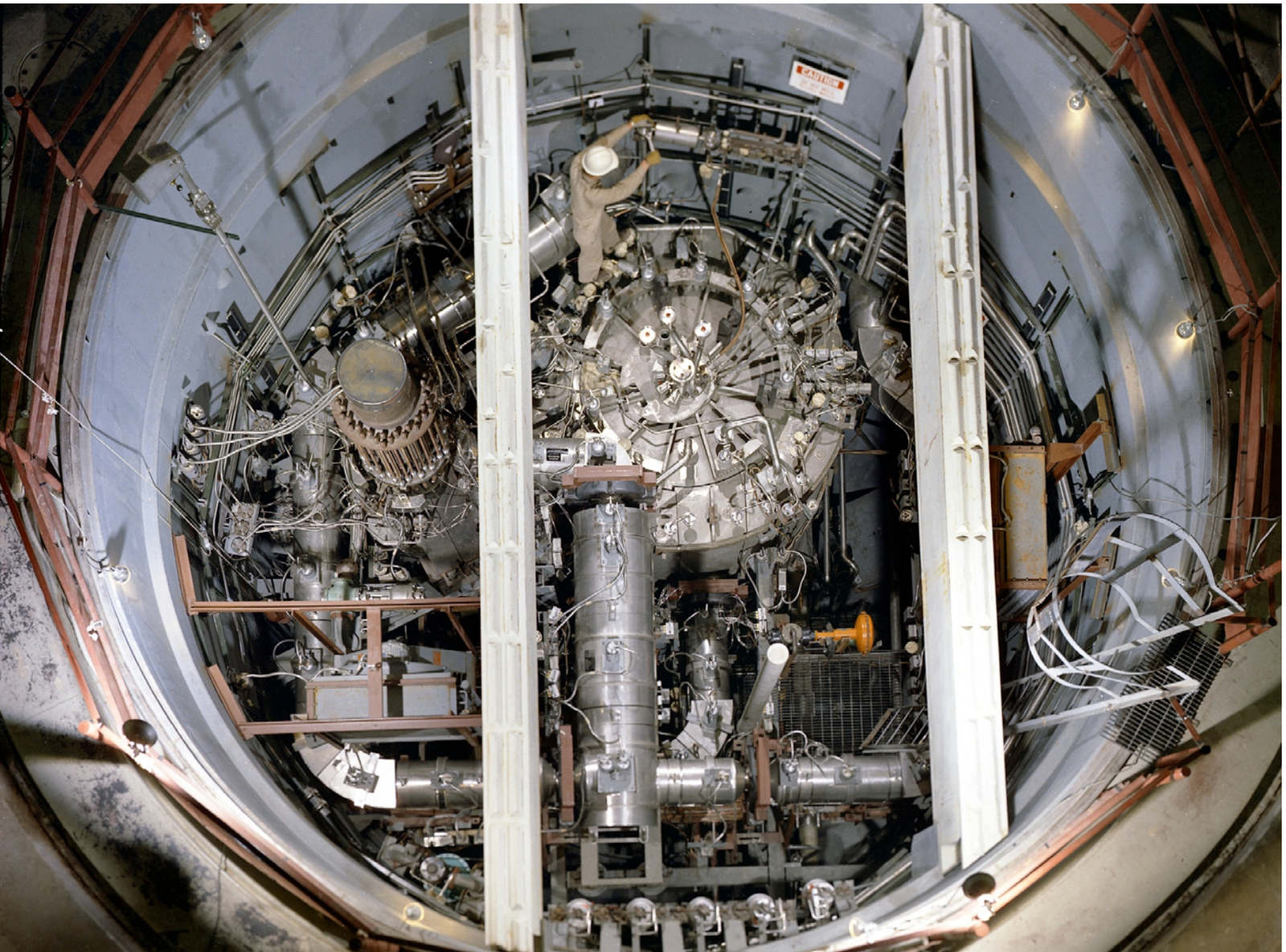


Molten salt reactors

Inherent safety – safety by physics



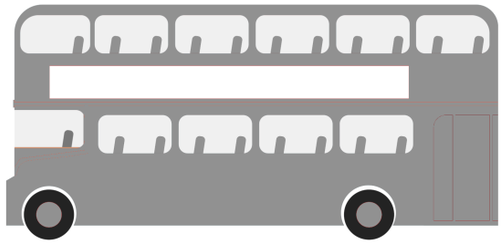
MSRE 1960's - moderator challenge

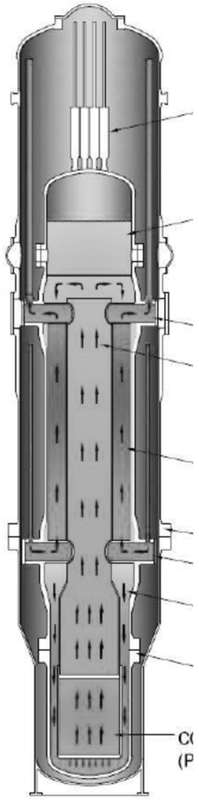


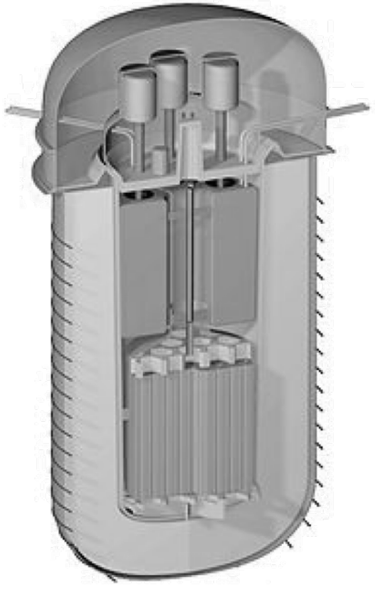
IRRADIATION DAMAGE IN GRAPHITE

Neutron irradiation alters the physical properties of graphite, but the dimensional changes that occur[16,17] are of major concern. These dimensional changes are illustrated in Fig. 6 where the data of Henson et al.[18] are presented for isotropic graphite. With increasing fluence the graphite first contracts and then begins to expand at a very high rate. Several potential problems arise as a result of these dimensional changes. First, the initial contraction will change the volume occupied by fuel salt and change the nuclear characteristics of the reactor. These dimensional changes seem small enough for most isotropic graphites that the nuclear effects may be accommodated by design. A second problem is stress generation due to flux gradients across a piece of graphite. Graphite creeps under irradiation[19] and this creep is large enough to reduce the stress intensities to quite acceptable values. The third and most serious problem is that the rapid growth rate represents a rapid decrease in density with potential crack and void formation. At some fluence this will cause the mechanical properties to deteriorate and the permeability to salt and fission products to increase. We feel that properties will be acceptable, at least until the material returns to its original volume, and have defined this fluence as the lifetime. A fourth

Proprietary **graphite-less** design, unequaled longevity and economy







London double-decker bus	CMSR 100 MW_e	NuScale LWR 70 MW_e	TE IMSR 125 MW_e	Westinghouse LWR 225 MW_e

Seaborg Technologies

Currently 28 employees and hiring.

- Incl. 10 PhDs and people from 5 continents.

Looking for €25m for next round

We are a talent magnet and the leading tech contester (outside the Great Wall):

- World leading in MSR physics.
- Chemical experiments started.
- **Licensing** process initiated.

Based in Copenhagen, Denmark.