Advanced Nuclear Reactors for Sustainable, Carbon-Free Energy Production

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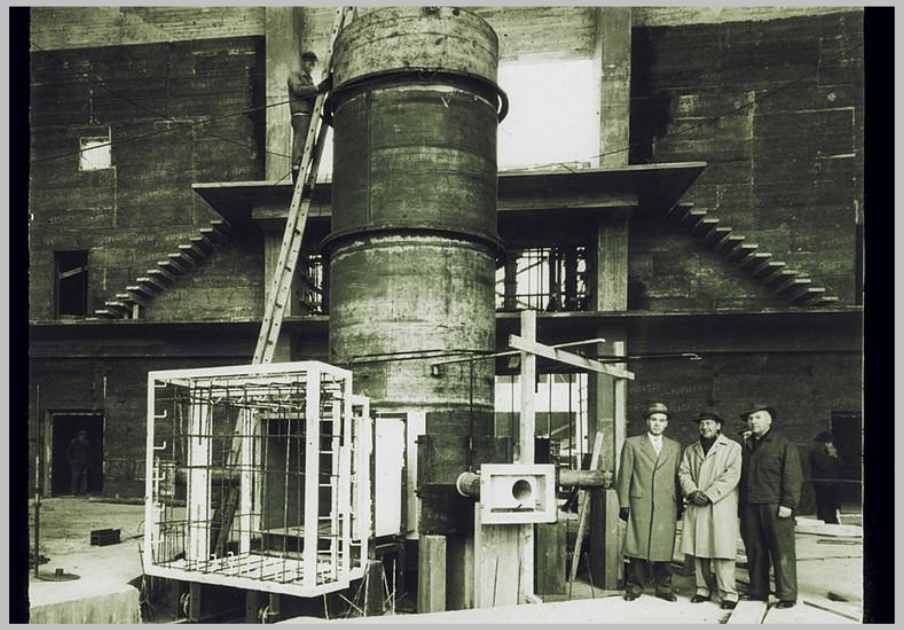
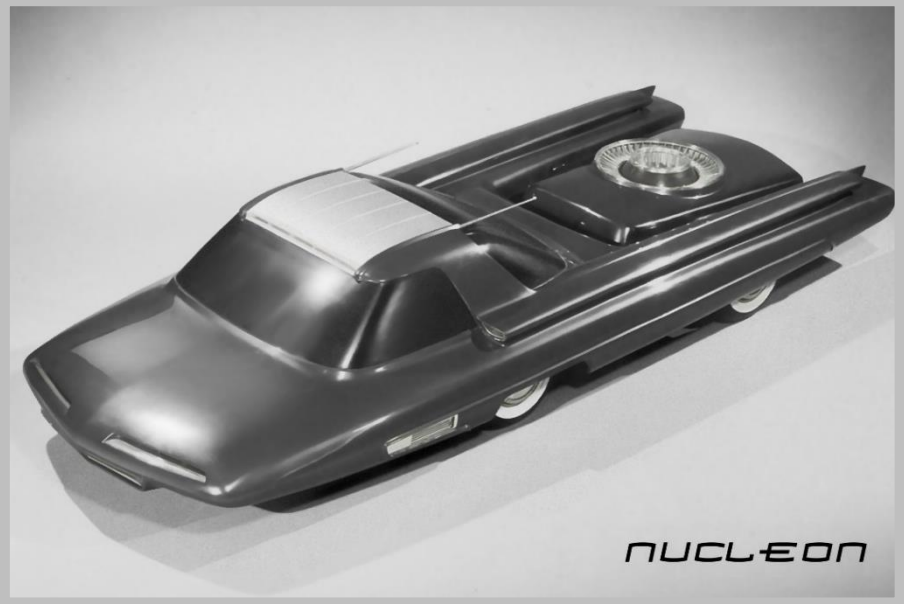
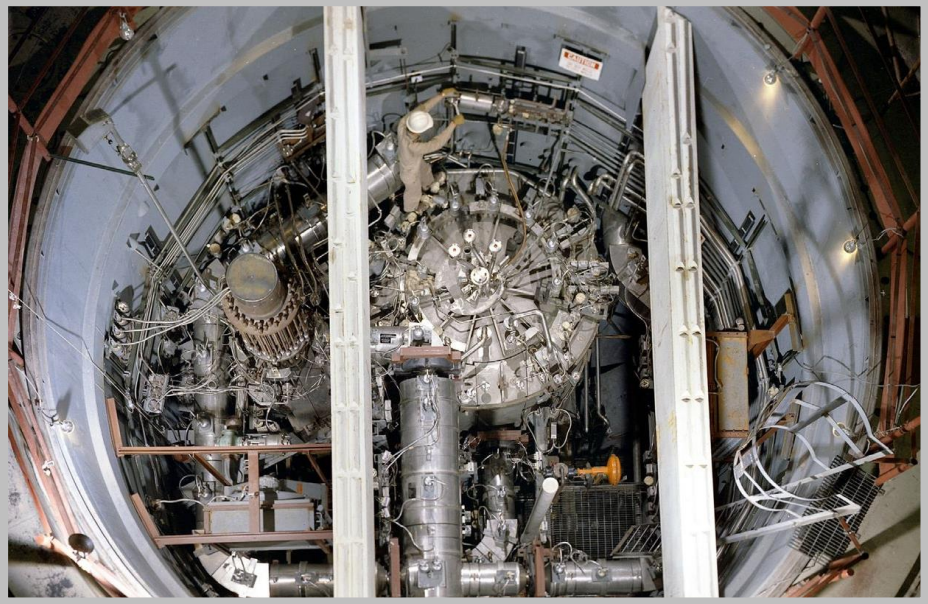
Nuclear Technology for the Sustainable Development Goals


INTERNATIONAL
ATOMIC ENERGY AGENCY
Mobile RADIOISOTOPE



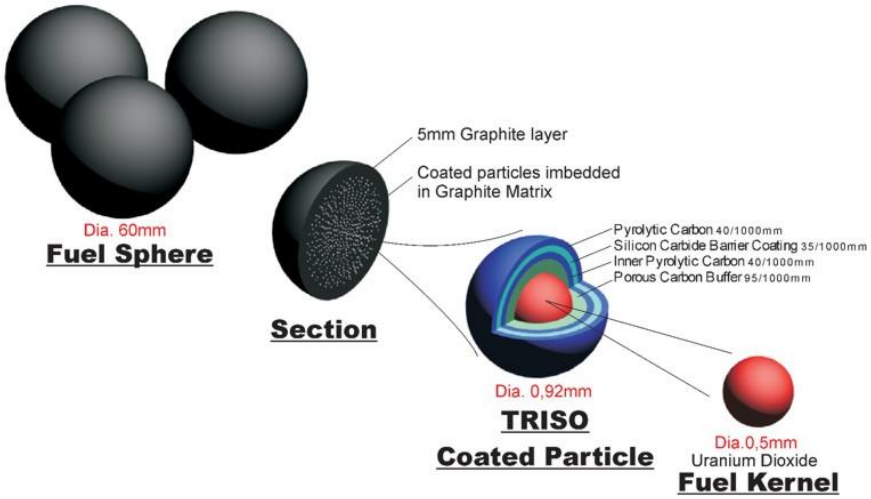

NUCLEON



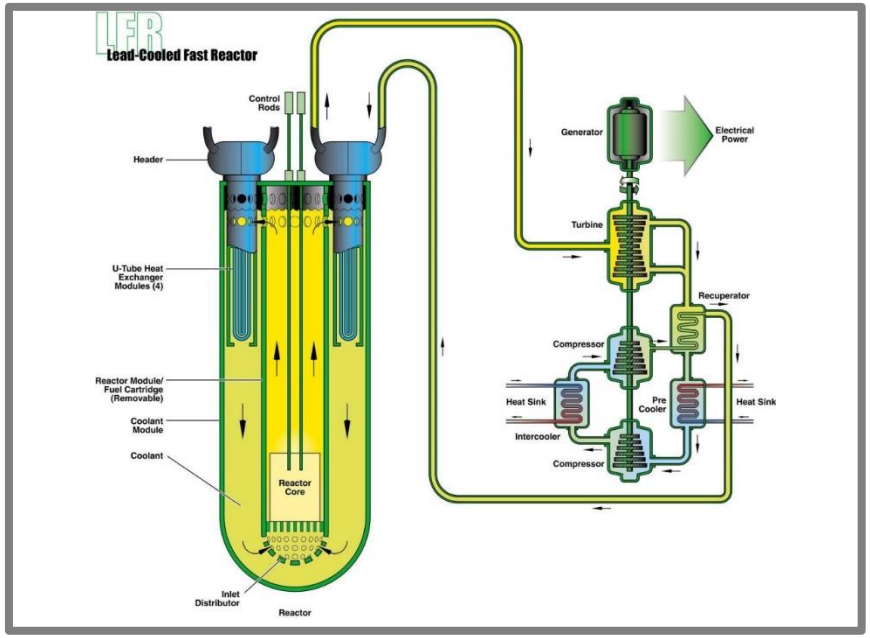
Typical nuclear reactors (light water reactors) use solid uranium oxide fuel, with liquid water as their coolant and moderator.

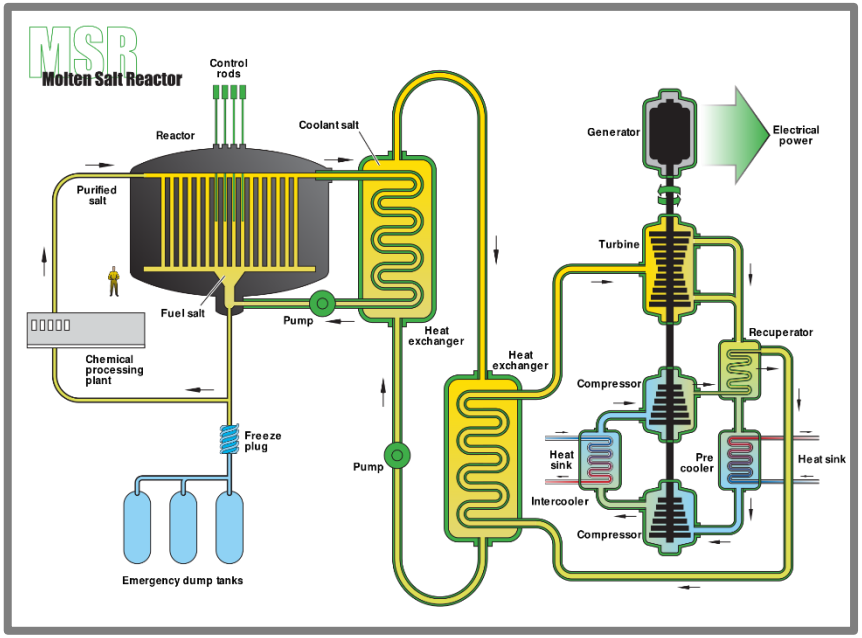
Advanced reactors can differ in three key ways:

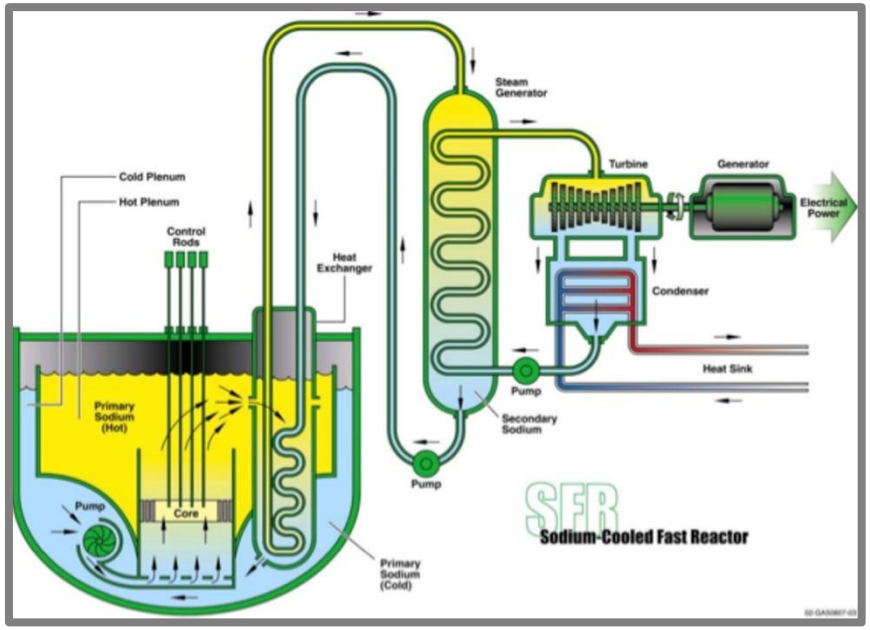
- **Fuel form**: Solid rods, pebbles, or liquid
- **Moderator**: Graphite, metal hydride, water, or no moderator
- **Coolant**: Water, liquid metal, gas, molten salt

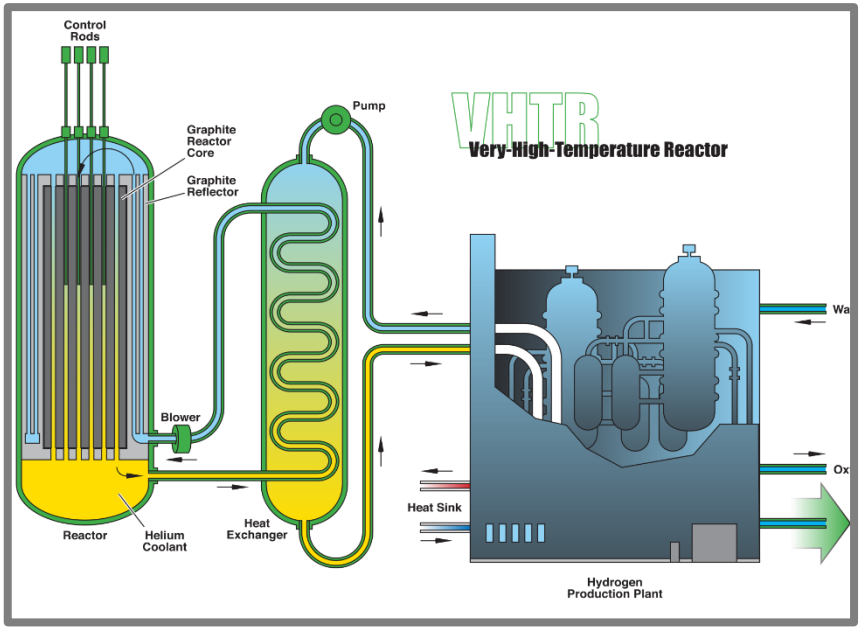


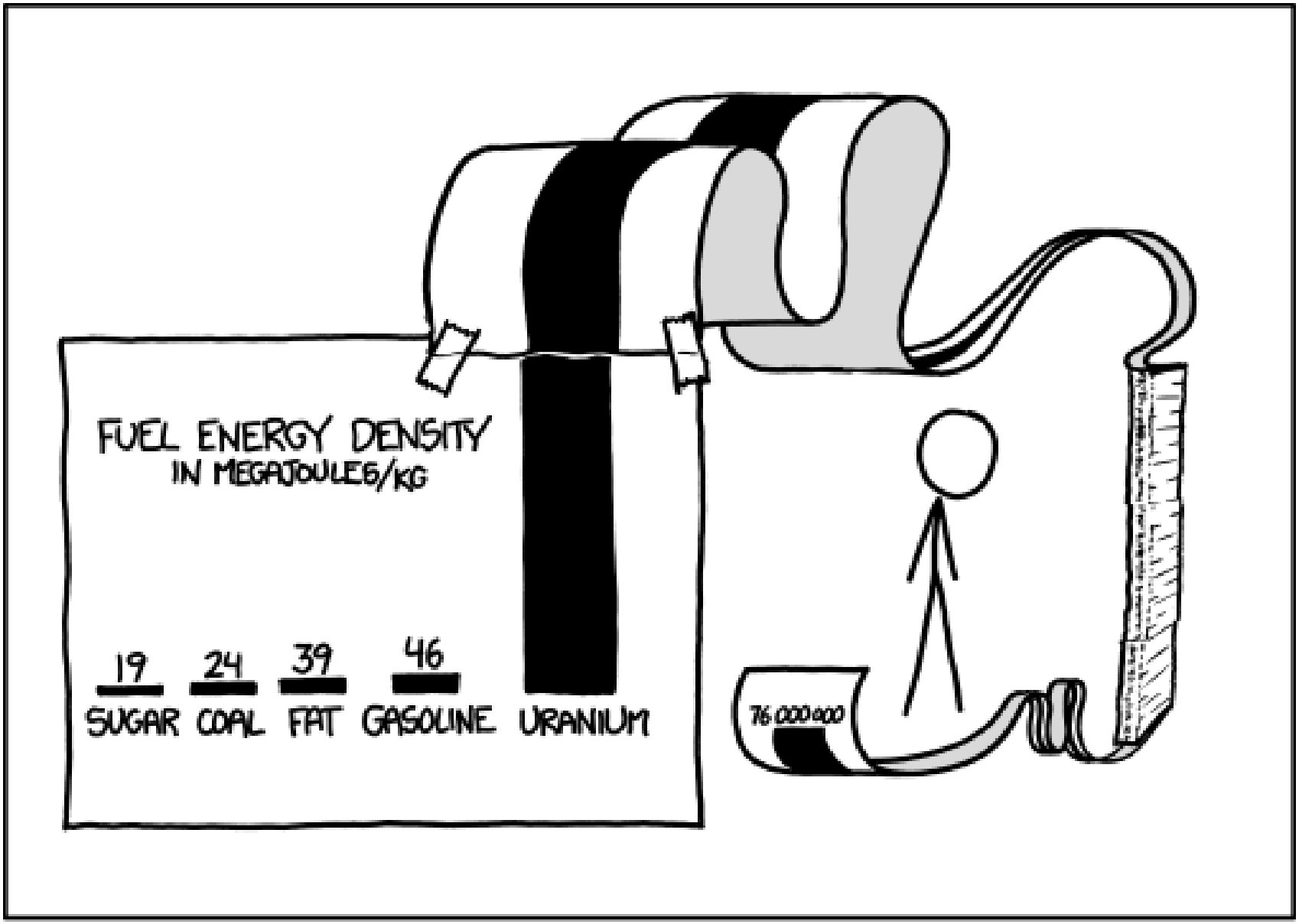
Changing these variables can improve **safety, decrease cost**, increase **proliferation-resistance**, and **reduce waste**.


LFR
Lead-Cooled Fast Reactor
Control Rods
Header
U-Tube Heat Exchanger Modules (4)
Reactor Module/ Fuel Cartridge (Removable)
Coolant Module
Coolant
Reactor Core
Inlet Distributor
Reactor
Generator
Electrical Power
Turbine
Recuperator
Compressor
Heat Sink
Pre Cooler
Intercooler
Compressor
Heat Sink

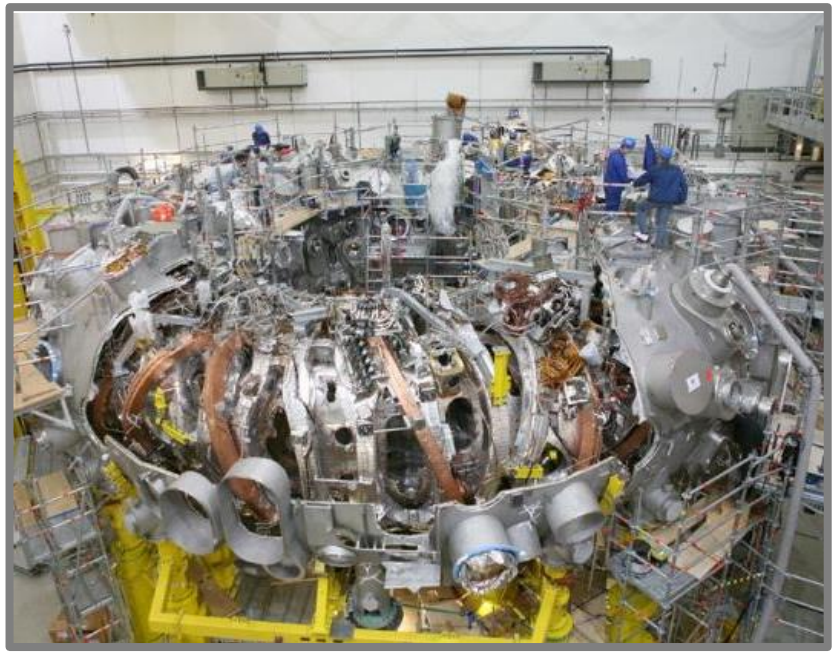

MSR
Molten Salt Reactor
Control rods
Reactor
Coolant salt
Purified salt
Fuel salt
Pump
Heat exchanger
Chemical processing plant
Freeze plug
Pump
Emergency dump tanks
Generator
Electrical power
Turbine
Recuperator
Heat exchanger
Compressor
Heat sink
Pre cooler
Heat sink
Intercooler
Compressor


Steam Generator
Cold Plenum
Hot Plenum
Control Rods
Heat Exchanger
Turbine
Generator
Electrical Power
Condenser
Heat Sink
Pump
Secondary Sodium
Primary Sodium (Hot)
Pump
Core
Primary Sodium (Cold)
SFR
Sodium-Cooled Fast Reactor


Control Rods
Pump
VHTR
Very-High-Temperature Reactor
Graphite Reactor Core
Graphite Reflector
Blower
Reactor
Helium Coolant
Heat Exchanger
Heat Sink
Hydrogen Production Plant



http://xkcd.com/1162/




generalfusion

Thank you!

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