

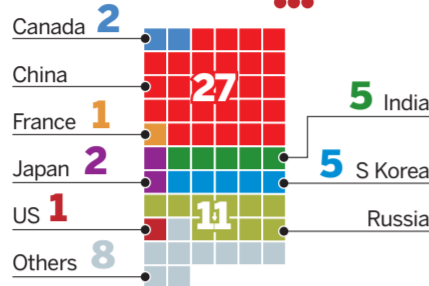
# The atomic atlas

## Number of reactors in operation

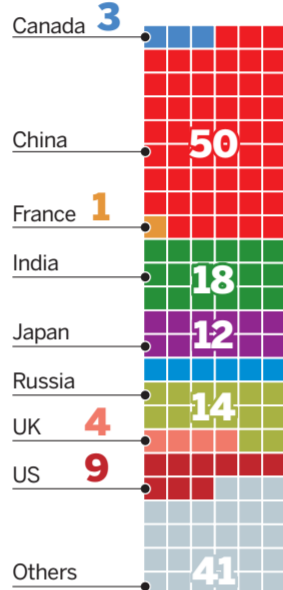


See below for definitions\*

## Reactors under construction



## Planned reactors



\* **Operating** Connected to the grid  
**Under construction** First concrete poured or major refurbishment under way  
**Planned** Approvals, funding or major commitment in place; most expected to be in operation in 8-10 years  
**Proposed** Specific programme or site proposals; most expected to be in operation within 15 years

**US (104)**  
 Administration and leading Republicans still support new nuclear construction. However, economics of many proposed projects appeared vulnerable even before quake, and safety fears have dominated media in recent days

**UK (19)**  
 Government continues to back construction of reactors but has ordered a safety review and warned that private sector investors could be reluctant to finance new plants

**France (59)**  
 With strong public support for nuclear power, President Nicolas Sarkozy had placed expertise in the sector at centre of export revival programme. Even there, however, events in Japan have sparked debate

**Spain (8)**

**Brazil (2)**

**Argentina (2)**

## Others in Europe include



**Germany (17)**

**Sweden (10)**

**Ukraine (15)**

**S Africa (2)**

**Iran (2)**

**Pakistan (2)**

**India (20)**

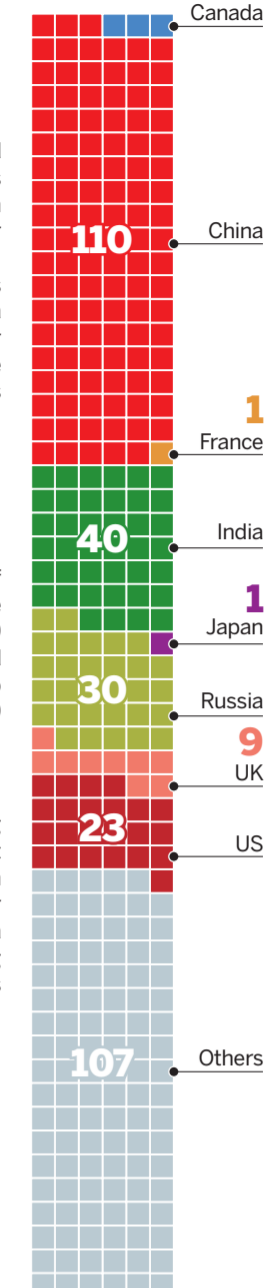
**Japan (55)**

**S Korea (21)**

**Russia (32)**

**China (13)**

## Proposed reactors



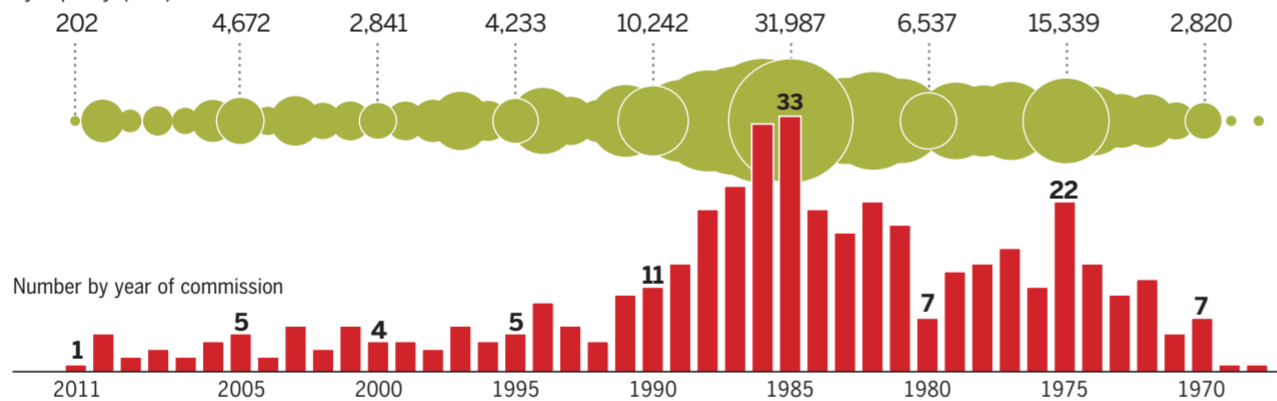
**China (13)**  
 Has announced suspension of approvals for new projects in world's largest reactor construction programme. Demand for energy is growing fast, and a slowdown in new nuclear is likely to mean more use of coal and gas

**Japan (55)**  
 Disaster has underlined shortage of domestic energy sources. Before quake, nuclear power provided 30 per cent of electricity supplies, and there had been plans to raise that to 50 per cent by 2030

**India (20)**  
 With existing power supplies leaving hundreds of thousands without electricity, New Delhi has long been enthusiastic about new nuclear plants. However, it has ordered a review of safety amid mounting concern about risks

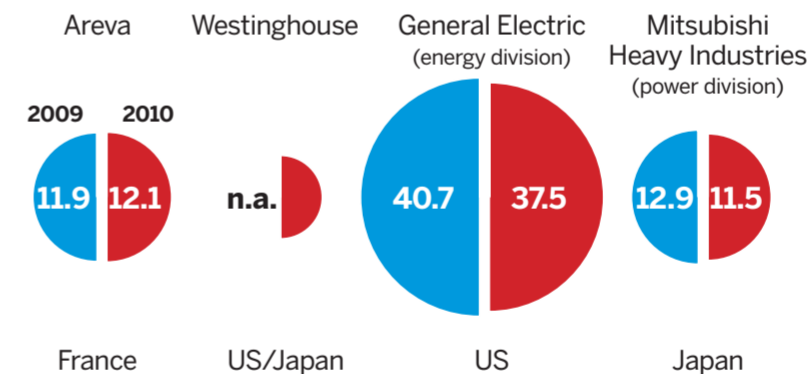
## Existing nuclear power stations

By capacity (MW)



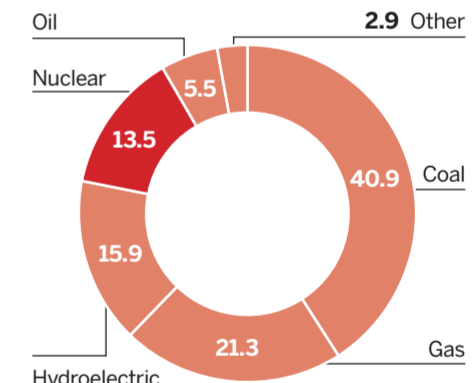
## Reactor manufacturers

Sales (\$bn)



## Global power mix

Electricity generation, 2008 (%)



## Reactors The generation gap

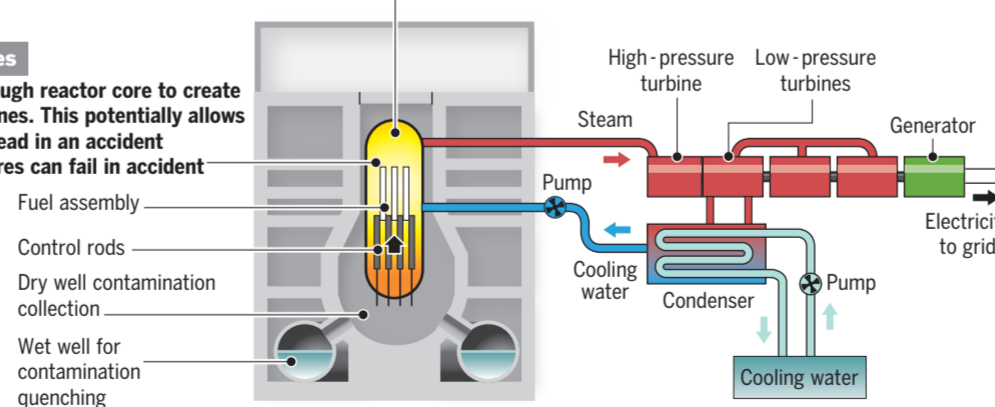
Most reactors that came into service in the 1960s-90s are second generation. A few generation three reactors are in service in Japan. More are under construction there, and others in China, France and Finland

### Second generation

In this example, a boiling water reactor as at Fukushima Daiichi

#### Main disadvantages

- Water pumped through reactor core to create steam to power turbines. This potentially allows contamination to spread in an accident
- Active safety features can fail in accident



### Third generation

In this example, a pressurised water reactor such as Westinghouse AP1000

#### Main advantages

- Cooling water held in self-contained loop, preventing contamination of other parts of system
- Passive safety features continue to work despite loss of power

