

The Nuclear Future

Contemporary Topics

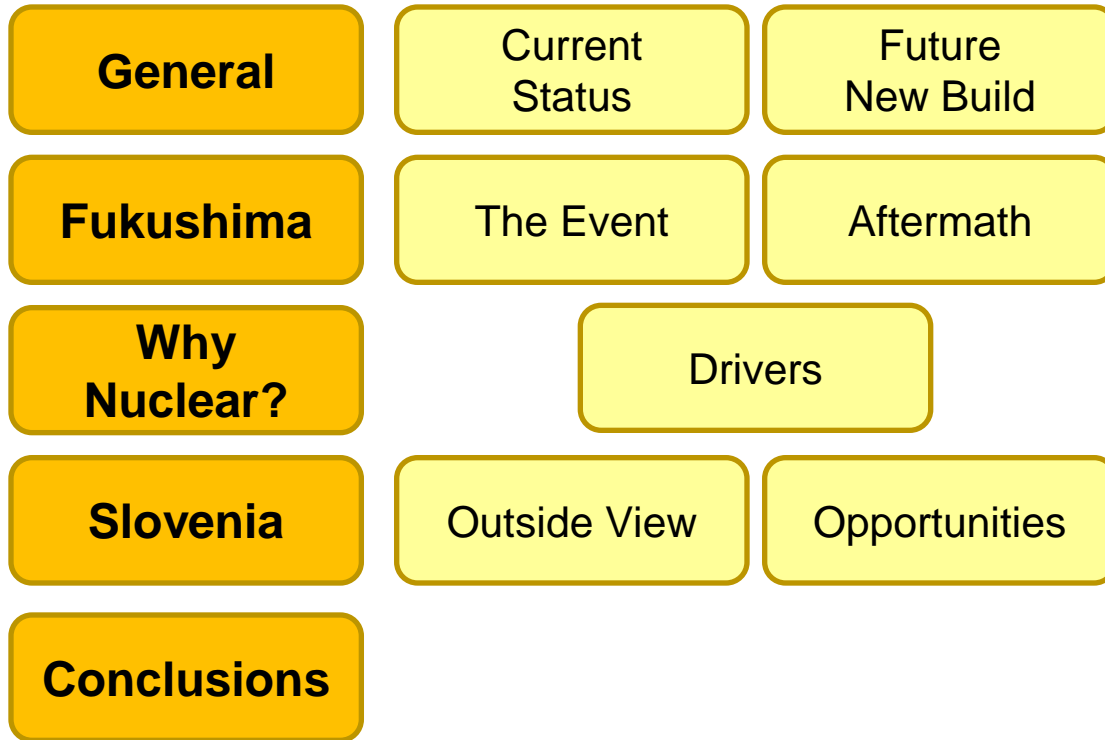
March 7, 2012

Ljubljana, Slovenia

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Outline Nuclear Power and New Build

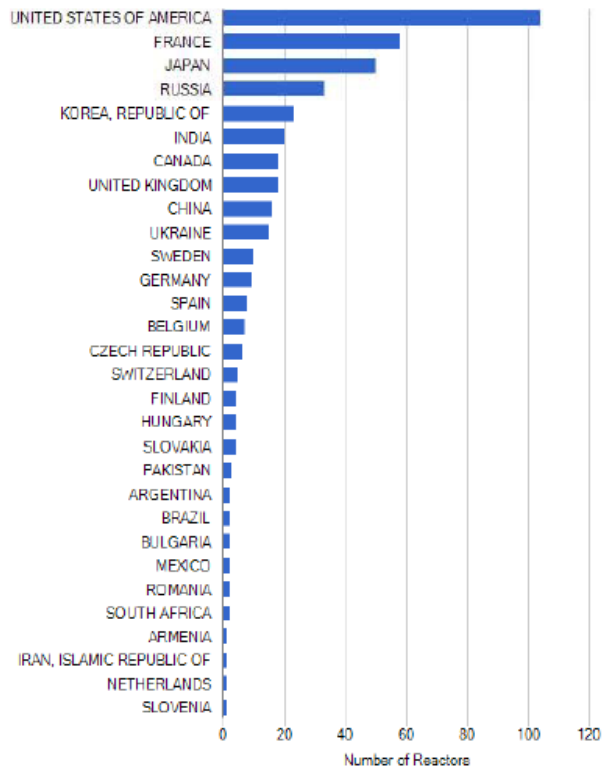


General

Current Status

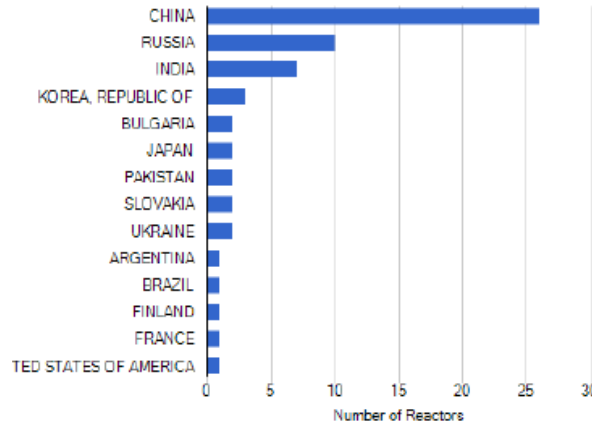
In Operation

Total Number of Reactors: 437



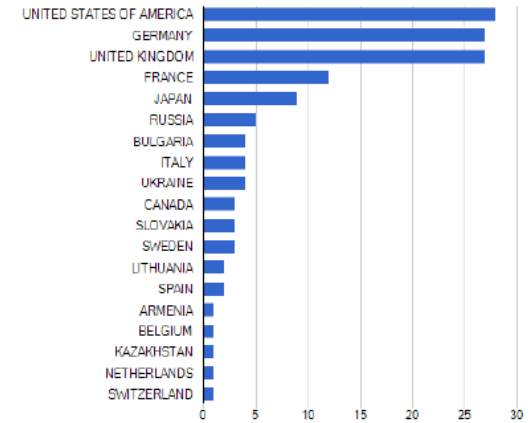
Under Construction

Total Number of Reactors: 63

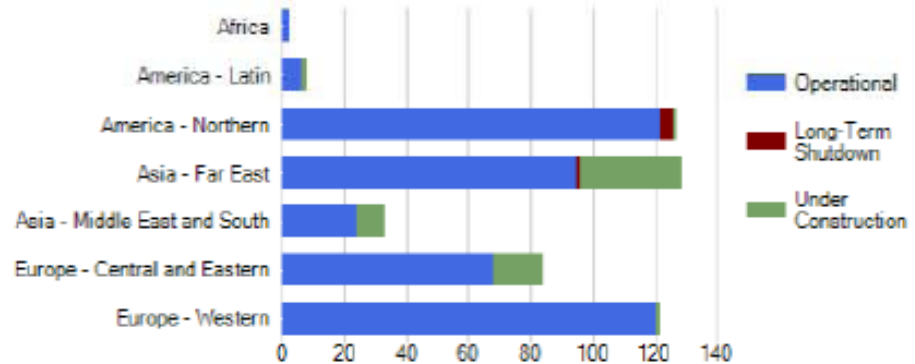


Permanent Shutdown

Total Number of Reactors: 138



Regional Distribution of Nuclear Power Plants



Ref: IAEA-PRIS

General

Future
New Build

World Nuclear Association Estimate of Reactors Worldwide

Today	~440 Reactors
By 2020	~580 Reactors
By 2030	~820 Reactors

REUTERS

Georgia Power
Westinghouse

1. "3/11" Tōhoku earthquake (9.0) and Tsunami (up to 40 m) rendered ~20,000 casualties (deaths related to Tsunami and drowning).
2. Due to earthquake Unit 1, 2, 3 shut down automatically (4, 5, 6 were already off-line) followed by emergency core cooling.
3. Tsunami flooded Fukushima Daiichi connections to power grid and broke it.
4. Core cooling capability was lost.
5. Level 7 (for all 6 reactors) on IAEA's scale: "Major Accident"

Fukushima

Aftermath

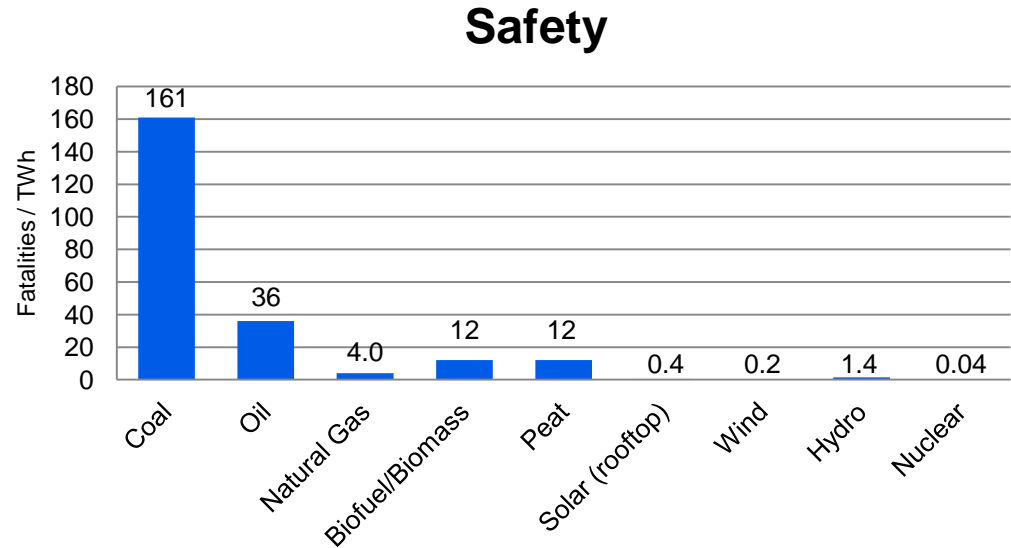
- Population relocated: ~300,000
- Exclusion Zone: 20 km
- Approximate cost: \$70-245 Bn
- Fukushima Nuclear related Deaths: 0

- Has this slowed down the market for nuclear new build?

Why Nuclear?

Drivers

- Increasing energy demand
 - China: ~70 GWe by 2020
 - India: ~50 GWe by 2020
 - Saudi Arabia: ~20 GWe by 2030
- Security of supply
 - Dependency on oil and gas
 - Storage of fuel
- Climate change and emissions
 - Reduction of greenhouse gases
 - Reduction of toxic emissions
 - Technical solution to nuclear waste exist
 - Nuclear and Hydro only alternatives to carbon emitting base load



- Excellent nuclear competence
 - Operational experience and excellence
 - Regulatory experience and excellence
 - Highly educated population
- Excellent location
 - Site
 - Industrialized region
- Effective administration
 - Clear roles and responsibilities

- Base load and in-country energy consumption
- Trade
- Keep the leading position as Center of Excellence for nuclear in the region
 - Latest commercially available technology
 - Strong increase in research with Universities
 - Training of people and export of knowledge
- Boost industry in Slovenia and region
- Many countries in Eastern Europe are building for export – first to market will play a role

- Nuclear energy production will be part of the next generations
- Slovenia is in an excellent position to draw benefits from nuclear
- Competition is fierce
- To be competitive Slovenia should keep approaching opportunities in a modern and innovative way



