

Small Modular Reactor and Nuclear Fusion Startup Companies

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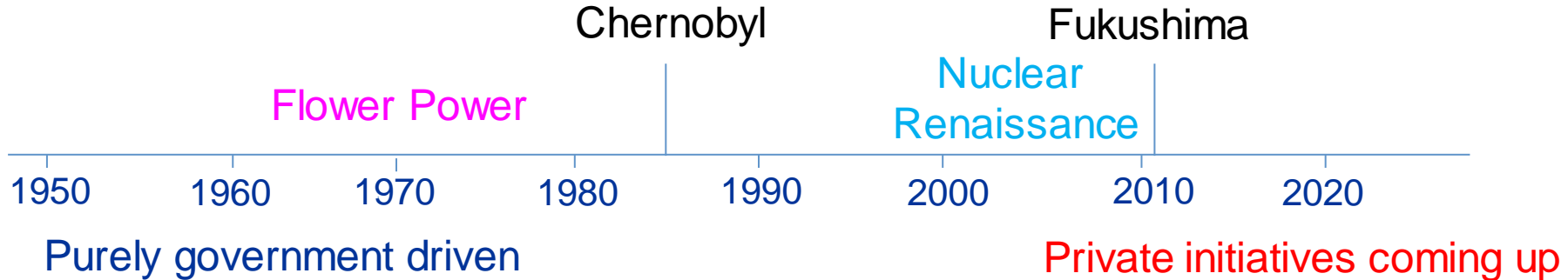
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Technical Meeting on Synergies
Between Nuclear Fusion Technology
Developments and Advanced Nuclear
Fission Technologies
6-10 June 2022

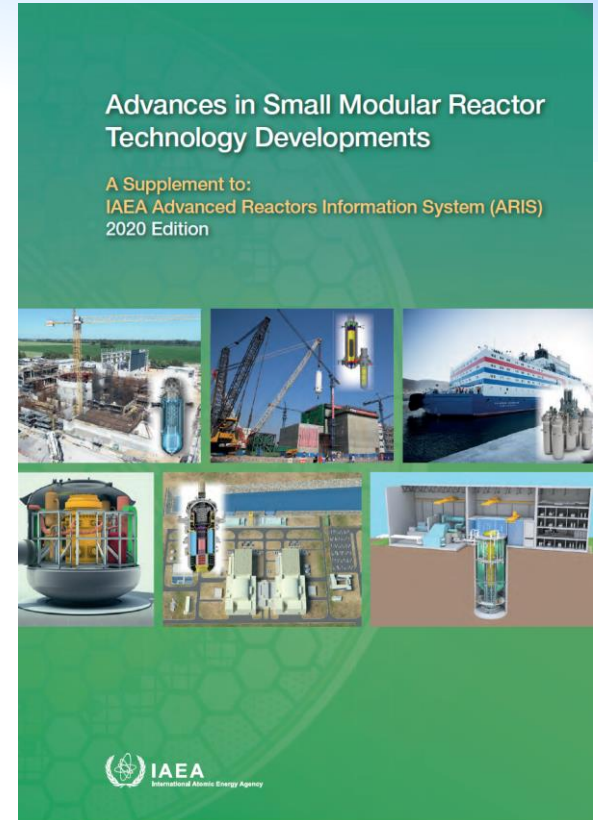
An observation

Timeline of nuclear development




Nuclear “start-ups”


- IAEA collects information in ARIS database
 - aris.iaea.org
- Publication “**Advances in Small Modular Reactor Technology Developments**”
 - 72 design descriptions
 - Ca. 15 nuclear “start-ups”
 - From 6 countries
- Used as based for further research into nuclear startups and their funding



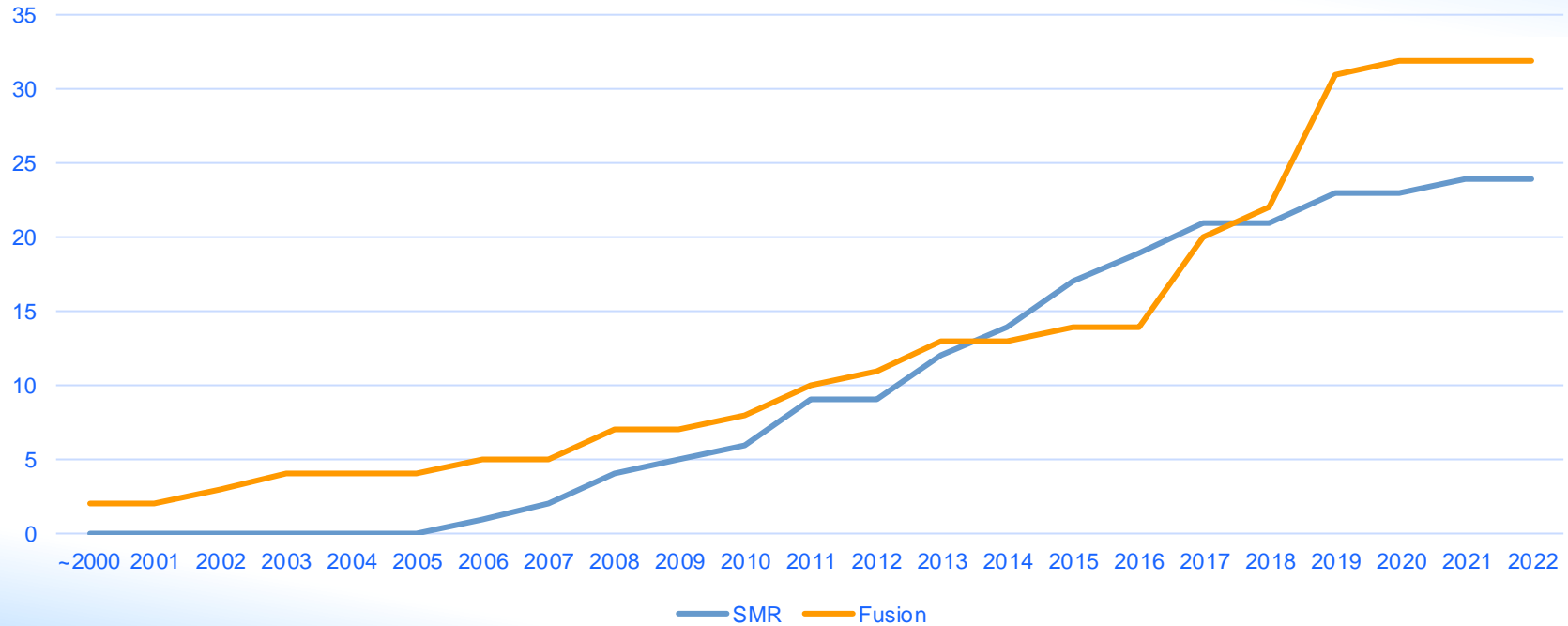
Nuclear Startup Companies by Country

Country	# SMR Companies	# Fusion Companies
Australia	0	1
Canada	4	3
Denmark	2	0
Estonia	1	0
France	0	1
Germany	1	1
Japan	0	1
Luxembourg	1	0
South Africa	2	0
Spain	0	1
Sweden	2	0
UK	0	4
USA	11	20
Total	24	32

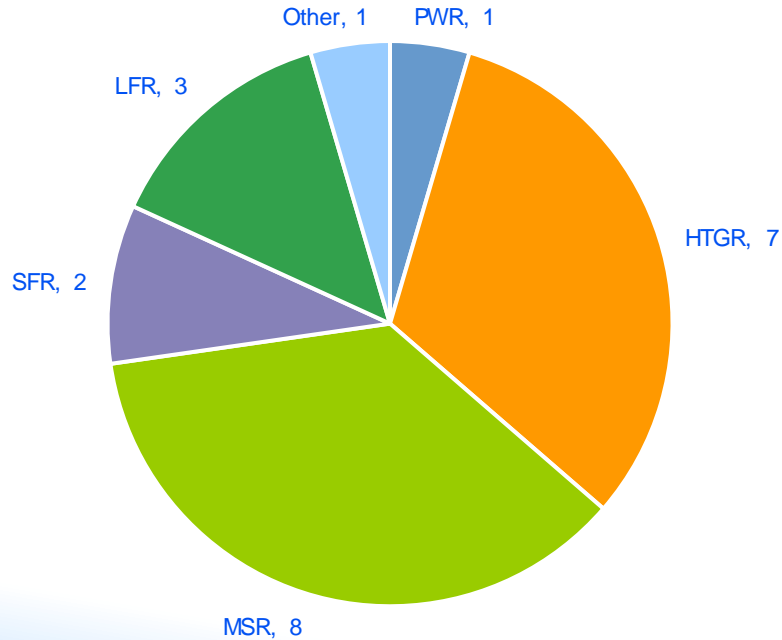
 nuclear country

 non-nuclear country

Cumulative Number of Startup Companies by Founding Year



SMR Reactor Types



PWR: Pressurized Water Reactor

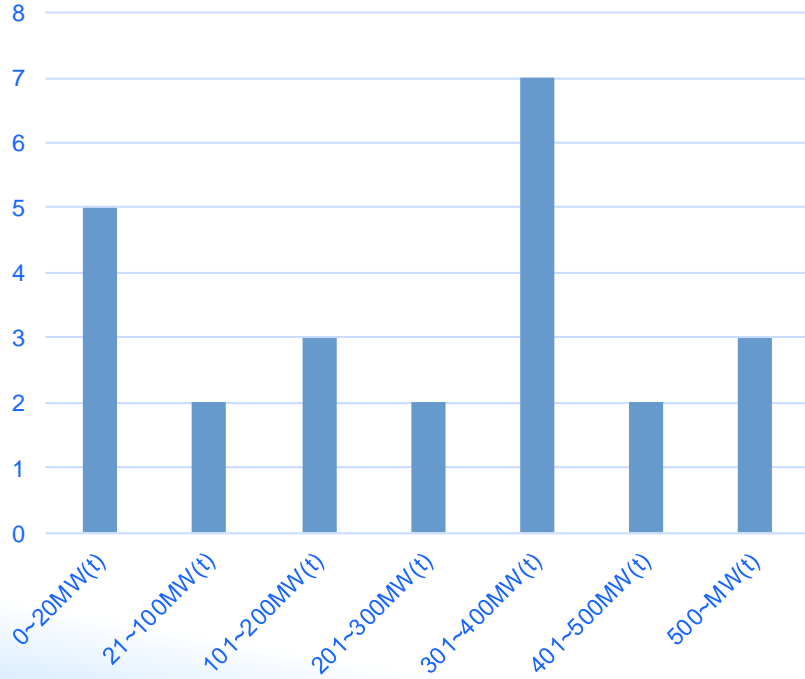
HTGR: High Temperature Gas Reactor

MSR: Molten Salt Reactor

LFR: Lead Fast Reactor

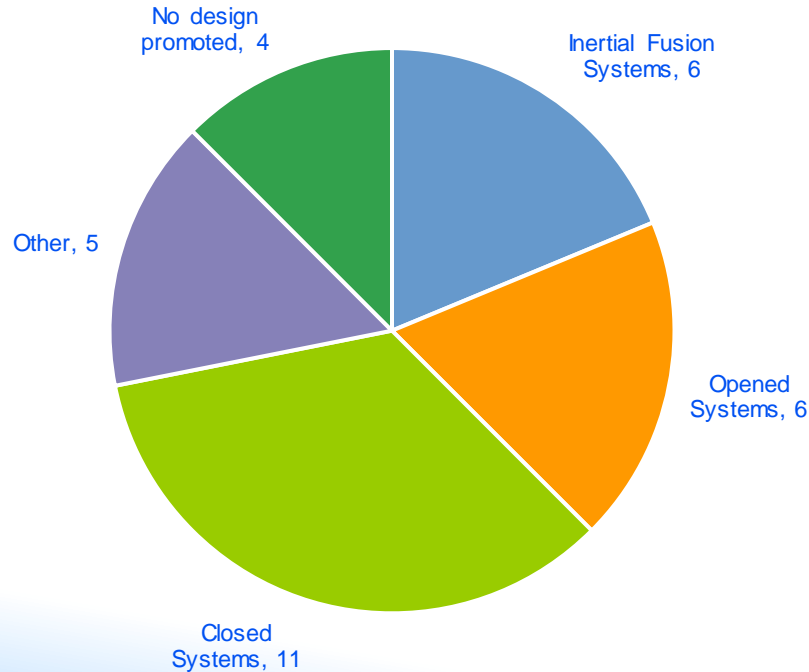
SFR: Sodium Fast Reactor

SMR thermal power output



- Of 24 companies 5 will use microreactors <20 MW(t)

Nuclear Fusion Reactor Types



Inertial Fusion Systems

- Particle accelerators
- Lasers
- Electrostatic potential wells

Opened Systems

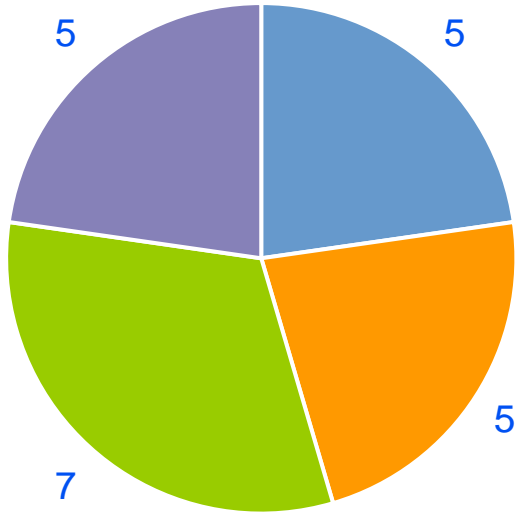
- Pinches
- Magnetized target

Closed Systems

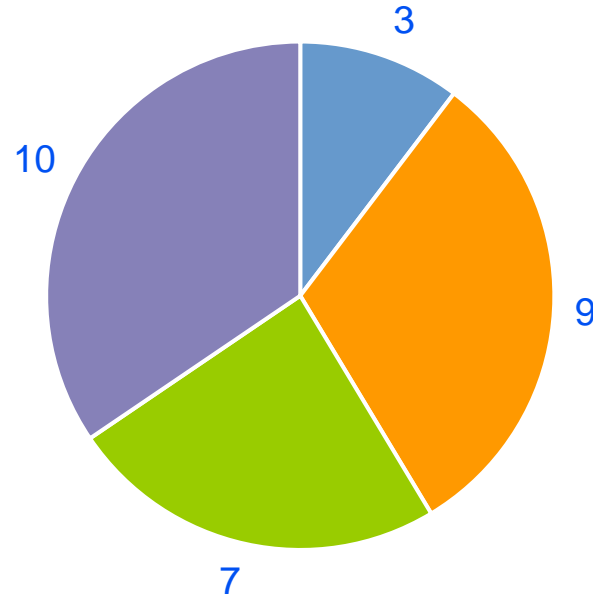
- Field reverse configuration
- Tokamak
- Stellarator

Funding for SMR and Nuclear Fusion Startup Companies

SMR



Nuclear Fusion



- Government Only
- Private Only
- Both Government and Private
- No Investments or No Information

Funding Rounds on SMR and Nuclear Fusion Startup Companies

Angel Round:

- small round designed to get a new company off the ground.
- Investors include:
 - individual angel investors
 - angel investor groups
 - friends & family

Seed Round:

- typically comes after an angel round
- among the first rounds of funding a company will receive
- round sizes range \$10k–\$2M

Venture Round:

- coming from a venture capital firm

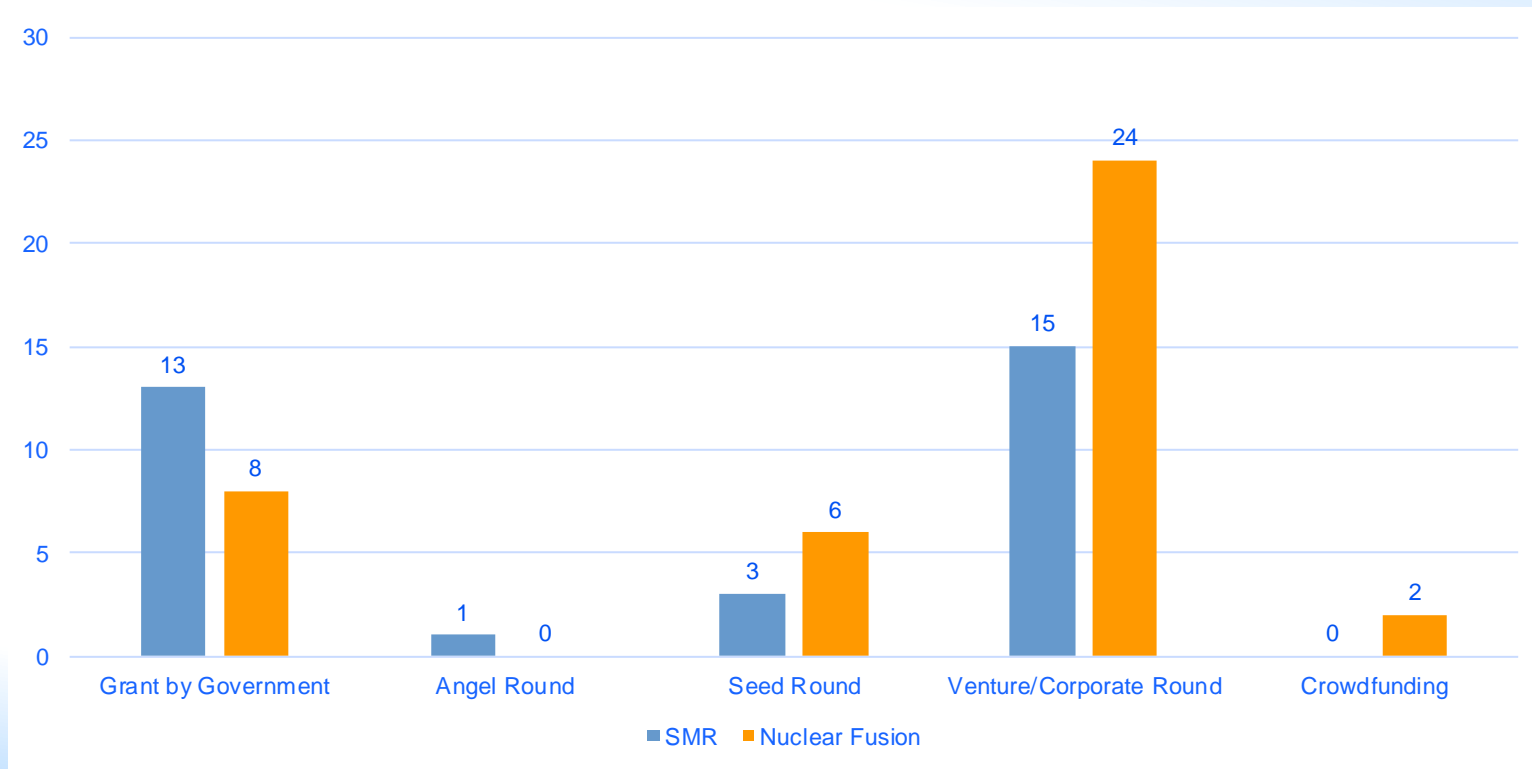
Corporate Round:

- when a company, rather than a venture capital firm, makes an investment in another company.
- often for the purpose of forming a strategic partnership.

Equity Crowdfunding:

- individual users invest in companies in exchange for equity.
- Typically the investors invest small amounts of money

Funding Rounds on SMR and Nuclear Fusion Startup Companies



Findings

- Significant number of startup companies both in SMR (24) and fusion (32), for SMR mostly in advanced reactor types
- SMR companies have a larger proportion of grants from governments while there are more private investors for nuclear fusion companies
- Insufficient statistical information on amount of funding
- Caveat: gap between funds needed for demonstrator and currently available funding



IAEA

International Atomic Energy Agency
Atoms for Peace and Development

Thank you for your attention!

