



# EU/Euratom GIF Activities



ESFR-SMART Spring School, zoom meeting, 29 March 2021

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**Brief Overview of the involvement of GIF Members in systems R&D**

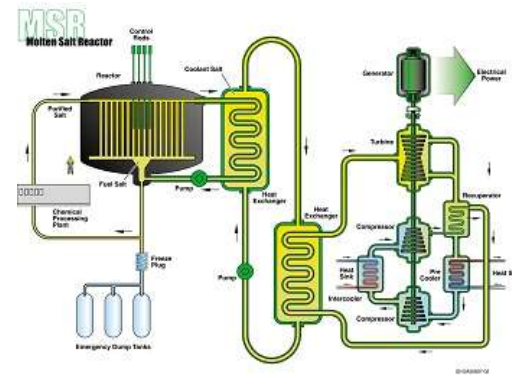
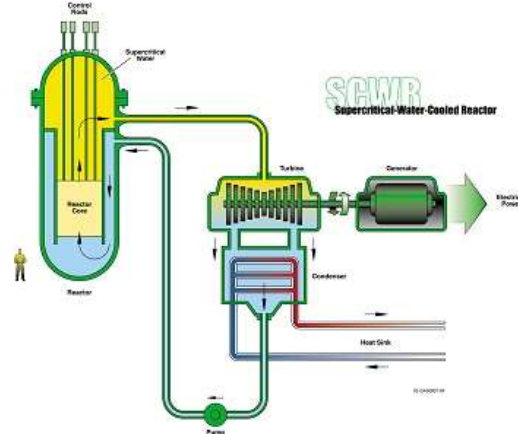
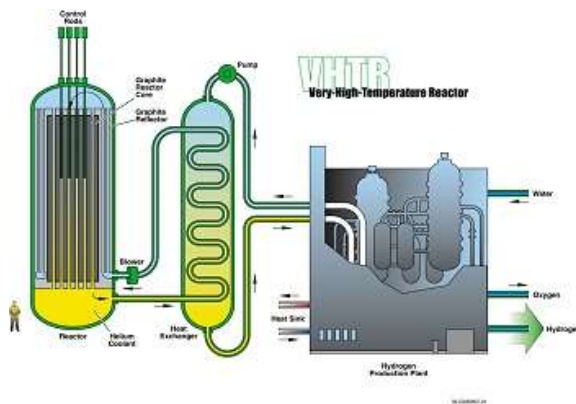
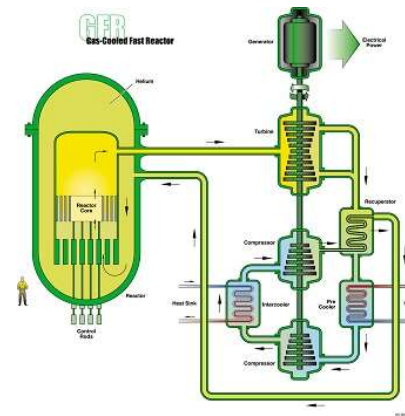
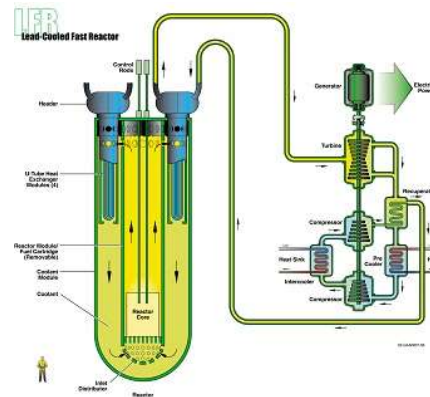
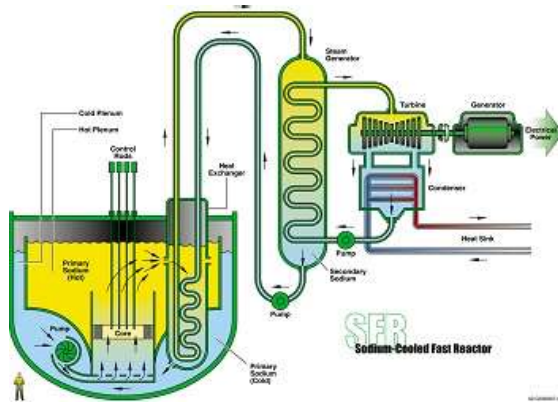
**EU/Euratom contribution to GIF International Forum**

**EU/Euratom networking opportunities SNETP, EERA-JPNM, EURAD RWM**

**Horizon Europe and Euratom Research and Training (2021-25-27)**

**Future Perspectives**

# Generation IV Systems



**Aiming at improvements in:**

- Sustainability
- Economics
- Safety and reliability
- Proliferation resistance and physical protection
- Higher flexibility asset

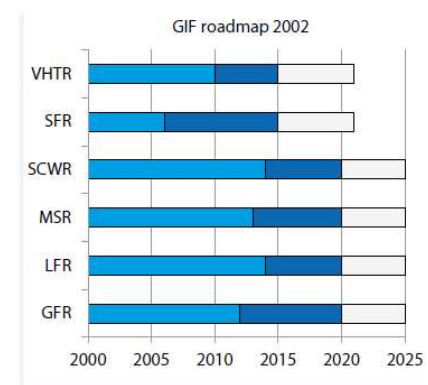
## Involvement of GIF Members in systems R&amp;D (as of Jan 2021)

												
SFR			•	•	•	•	•			•	•	•
VHTR	•	•	•	•	•	•			•	•	•	•
LFR			•		•	•	•			•		•
SCWR		•	•		•		•					•
GFR				•	•							•
MSR	•	•		•			•		•	•		•

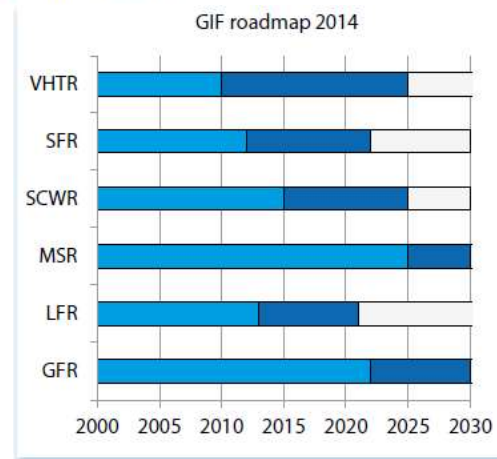
• : signatory of System Arrangement

• : signatory of Project Arrangement

• : signatory of MoU

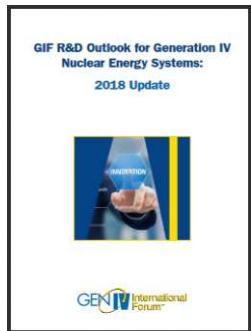


■ Viability ■ Performance □ Demonstration





# GIF Governance, WGs, TFs, SSCs, Projects, Publis



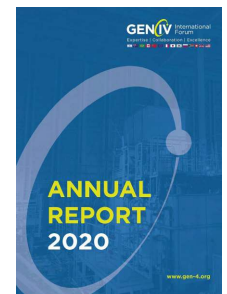
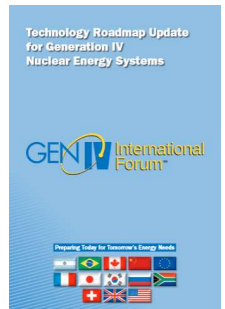
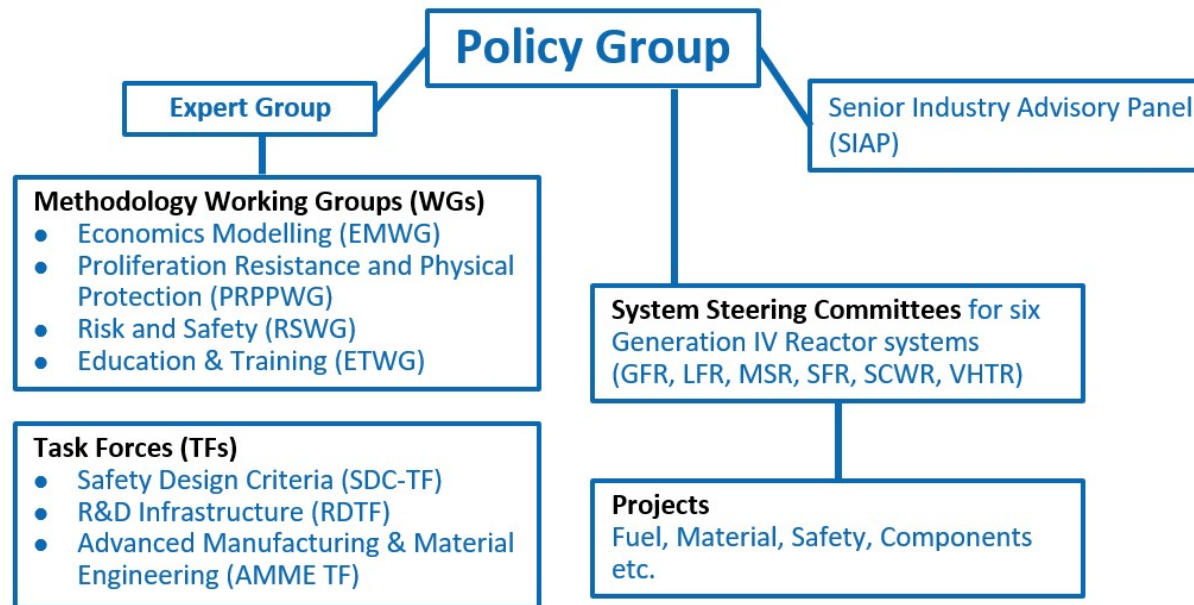
R&D INFRASTRUCTURE TASK FORCE FINAL REPORT



GIF R&D Task Report January 2021



**GIF Annual Reports**  
**Symposium Publications**  
**Technology Roadmap**  
**R&D Outlook**  
**R&D Infrastructure RDTF**  
**Conferences, events, future**



[https://www.gen-4.org/gif/jcms/c\\_119034/gif-2019-annual-report](https://www.gen-4.org/gif/jcms/c_119034/gif-2019-annual-report)  
[https://www.gen-4.org/gif/jcms/c\\_44724/symposium-publications](https://www.gen-4.org/gif/jcms/c_44724/symposium-publications)  
[https://www.gen-4.org/gif/jcms/c\\_60729/technology-roadmap-update-2013](https://www.gen-4.org/gif/jcms/c_60729/technology-roadmap-update-2013)  
[https://www.gen-4.org/gif/jcms/c\\_108744/gif-r-d-outlook-for-generation-iv-nuclear-energy-systems-2018-update](https://www.gen-4.org/gif/jcms/c_108744/gif-r-d-outlook-for-generation-iv-nuclear-energy-systems-2018-update)  
[https://www.gen-4.org/gif/jcms/c\\_173655/r-d-infrastructure-task-force-final-report](https://www.gen-4.org/gif/jcms/c_173655/r-d-infrastructure-task-force-final-report)  
 Workshop SMR vendors (02/2020, Paris), FR22 (04/2022, Beijing), Symposium/Workshop/SMR 2022, RDTF Infra follow-up

<https://www.gen-4.org>

# EU/Euratom 10 years' contribution to GIF

**10 years' period (2005-2014) overview** of Euratom contributing to all six Gen-IV systems, an estimated financial contribution from Euratom **giving only trends**. Data were retrieved from **RTD / JRC co-financed projects and from MS** using **publicly available information**

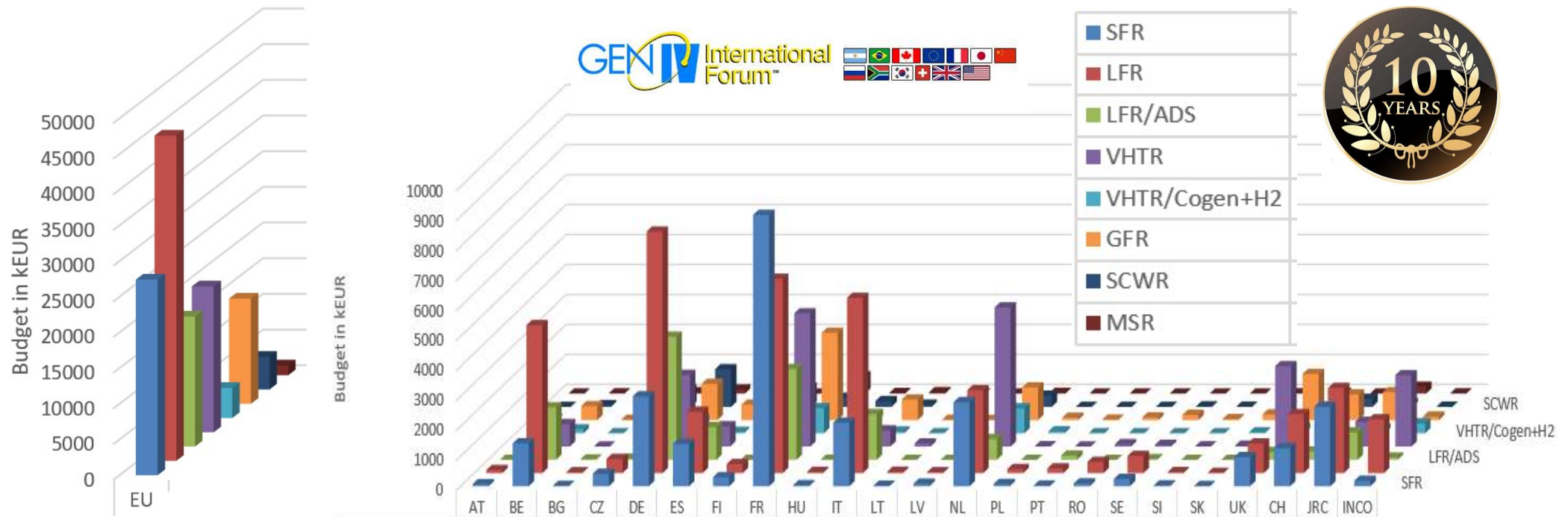
- **Projects directly contributing to specific system arrangements**
- **Projects on key cross-cutting fields** of nuclear safety, fuel developments, thermal hydraulics, materials research, numerical simulation and design activities of future reactor technologies, partitioning and transmutation, support to infrastructures, education, training and knowledge management, and international cooperation.
- **JRC activity (European Union direct actions), the Implementing Agent for Euratom within GIF, has complemented the European Union indirect actions by contributing about EUR 25 million (25-40 staff/year)** with its own specific funds **to the six GIF systems** with main focus on SFR, LFR and VHTR.



**GIF 2018 Symposium**

[https://www.gen-4.org/gif/jcms/c\\_117863/2018-gif-symposium-proceedings](https://www.gen-4.org/gif/jcms/c_117863/2018-gif-symposium-proceedings)

# EU/MS contribution to GIF projects e.g. 2004-15



**GIF 2018 Symposium** [https://www.gen-4.org/gif/jcms/c\\_44724/symposium-publications](https://www.gen-4.org/gif/jcms/c_44724/symposium-publications)  
**Progress in Nuclear Energy, volume 77** <http://www.sciencedirect.com/science/journal/01491970/77>  
**GIF Annual Reports** [https://www.gen-4.org/gif/jcms/c\\_44720/annual-reports](https://www.gen-4.org/gif/jcms/c_44720/annual-reports)  
**CORDIS Community R&D Information System** <http://cordis.europa.eu/>  
**EU Funding and Tenders** <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/home>  
**EU Financial Transparency System** [http://ec.europa.eu/budget/fts/index\\_en.htm](http://ec.europa.eu/budget/fts/index_en.htm)

## Review of Euratom projects on design, safety assessment, R&D and licensing for ESNII/Gen-IV fast neutron systems

- 9 EU project since late 2011
- 7 ESNII/Gen-IV fast neutron systems
- 45 MEUR of total budget including 28 MEUR of Euratom contribution.
- 64 organizations from 20 countries
- Design, R&D, safety and licensing aspects
- R&D in
  - TH and CFD
  - Fuel
  - Seismic
  - Multiphysics

	SFR	LFR	ADS	GFR	MSR
Design					
R&D	ESFR-SMART JASMIN	SESAME	SILER	ESNII Plus VINCO	SAMOFAR
Safety		SARGEN-IV			
Licensing				ALLIANCE	



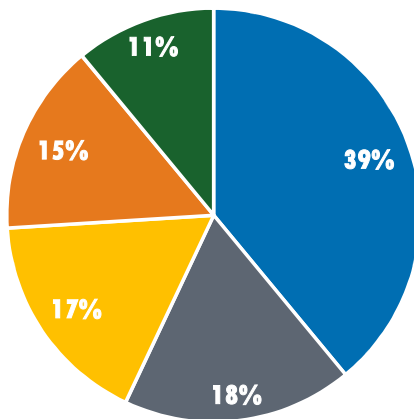
Latest H2020 Projects	Topic	R&D area	Euratom € M	Total € M
ESFR-SMART	SFR	Adv. SFR	5.0	10.1
PASCAL	LFR	Adv. HLM ALFRED MYRRHA	3.8	4.6
SESAME	HLM	Adv. HLM Safety	5.2	6.6
SafeG	GFR	Adv. GFR Safety Allegro	3.8	4.5
VINCO	GFR	Adv. GFR Safety Allegro	1.1	1.1
GEMINI+	HTR	Adv. HTR Cogeneration	4.2	5.5
ECC-SMART	SCWR	Adv. SCWR SMR safety features	4.0	9.0
SAMOFAR	MSR	Adv. MSR Molten Salt	3.5	5.2
SAMOSAFER	MSR	Adv. MSR Molten Salt	3.5	4.5
PUMMA	FC	FC Fuel Pu management	3.8	7.0
INSPYRE	FC	FC MOX fuel licensing	4.1	9.5
PATRICIA	FC	FC P&T Myrrha	6.5	9.0
GENIORS	FC	FC Partitioning (P&T)	5.0	7.5
MEET-(&A)-CINCH	FC	E&T RadioChemistry	4.6	5.1
GEMMA	MAT.	Adv. Materials	4.0	6.7
M4F	MAT.	Fu/Fi materials	4.0	6.5
McSAFER	MODEL.	Adv. Modeling SMR	4.0	4.1

R&D Areas
Computer codes
Components
Tribology and corrosion
Fuel
Material R&D
Safety analysis and demonstration
Multi-purpose plant
Design and System Integration
Development of a licensing framework
P&T waste minimization and recycling
Modelling
SMR

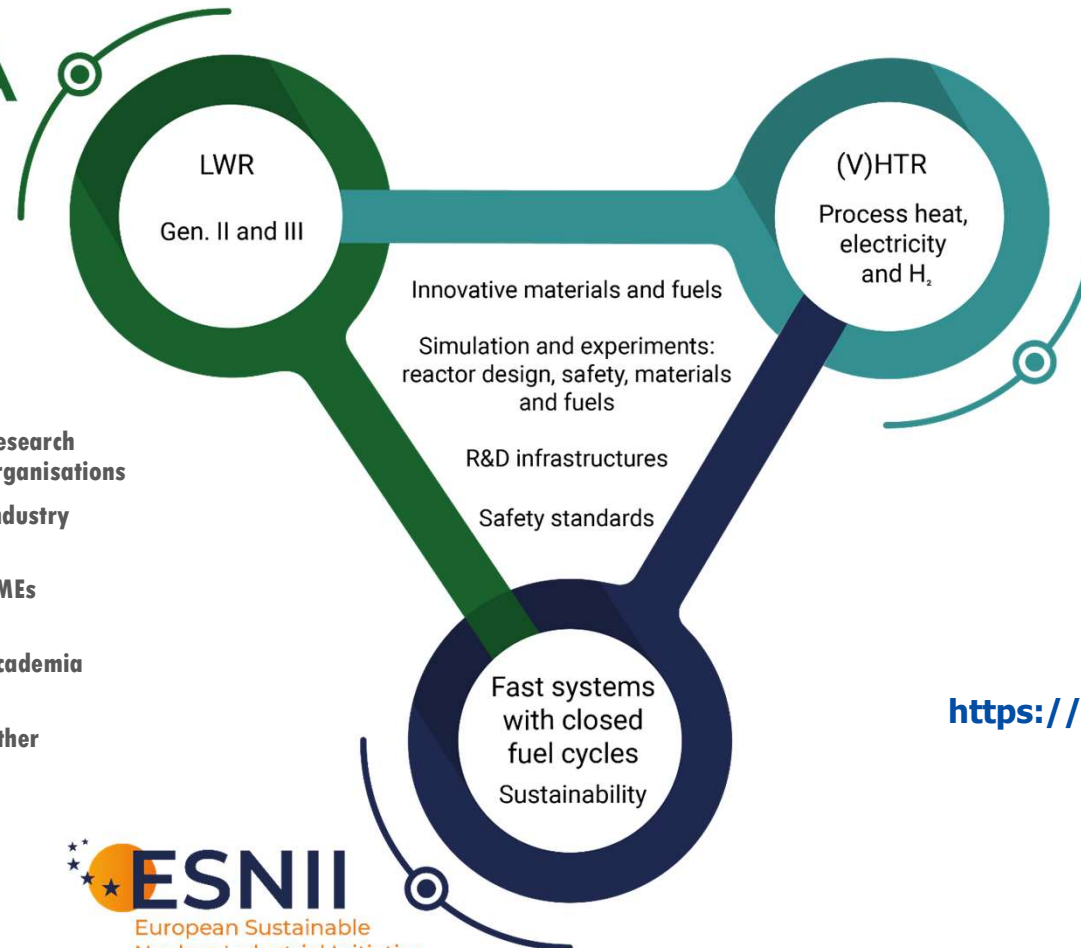
# SNETP Three Pillars



## Categories of membership

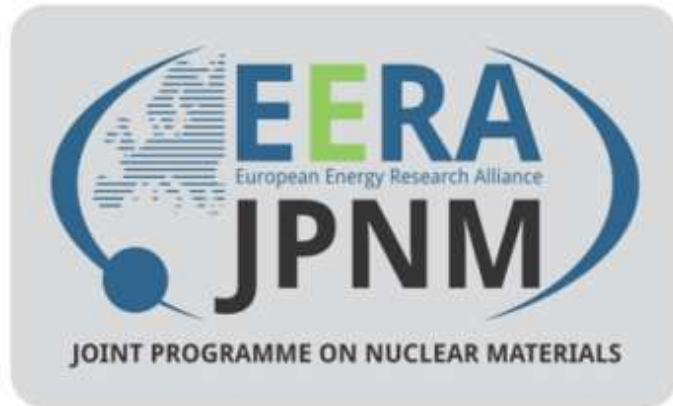


- Research organisations
- Industry
- SMEs
- Academia
- Other



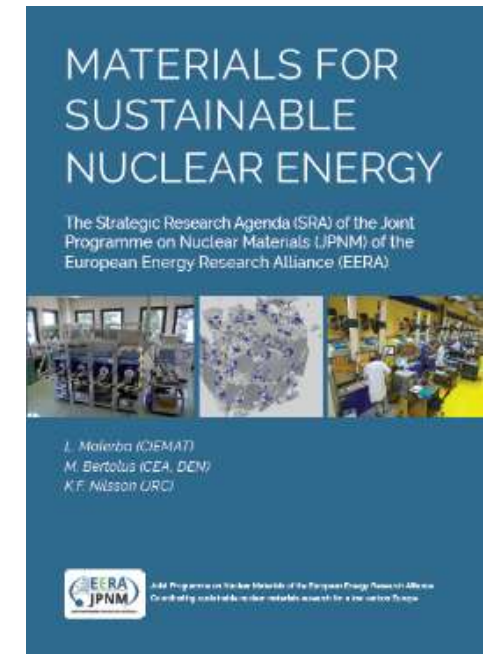
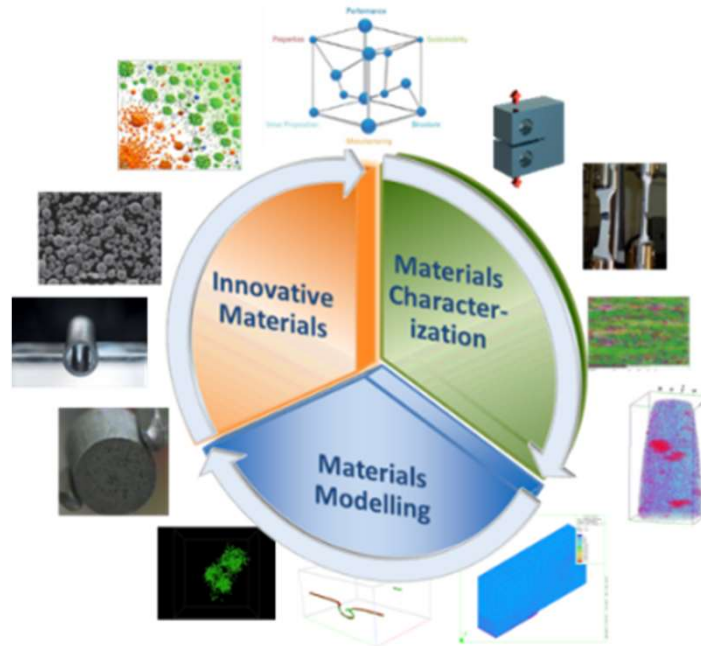
<https://snetp.eu/>

# EERA Joint Programme on Nuclear Materials



## Overarching objective:

improve **safety & sustainability** of nuclear energy, focusing on **materials issues**



**More than 50 organisations from 17 countries contribute to at least one of the 6 subprogrammes of the EERA JPNM devoted to qualification, modeling and development of structural and fuel materials:**

<http://www.eera-jpnm.eu>



- R&D
- Strategic studies
- Knowledge management
- Interacting with Civil Society



European Joint Programme  
on Radioactive Waste Management

**EURAD | 1<sup>st</sup> Annual event 16-18/03/2021**

**EURAD** <https://www.ejp-eurad.eu/>

**PREDIS** <https://predis-h2020.eu>

**IGDTP** <https://igdtp.eu/>

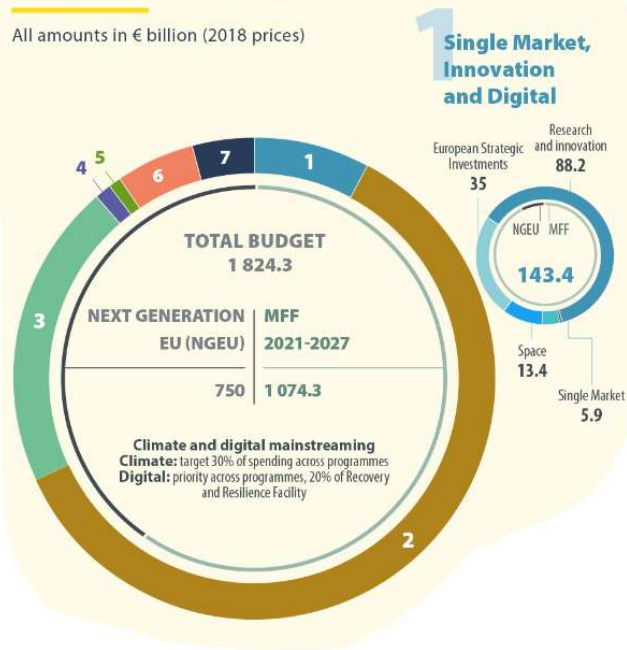




# FP9 (2021-27) Horizon Europe Budget: EUR 88,200 million

## EU expenditure for 2021-2027

All amounts in € billion (2018 prices)



	(7 years)	(5 years)
<b>Euratom Research and Training</b>	<i>EUR 1,980 million</i>	<b>EUR 1,380 million</b>
<b>Indirect RTD</b>		
• Fusion R&D	809	<b>583</b>
• Fission R&D Safety and radiation protection	370	<b>266</b>
<b>Direct JRC</b>		
• Fission Safety and safeguards	802	<b>532</b>

ITER (a dedicated EC Regulation, 7 years)	EUR million
	<b>5,600</b>

## EU Council PRESS RELEASE

**EURATOM** <https://www.consilium.europa.eu/en/press/press-releases/2020/12/18/euratom-research-and-training-programme-council-reaches-political-agreement/pdf>

**ITER** <https://www.consilium.europa.eu/en/press/press-releases/2020/12/18/fusion-energy-political-agreement-in-the-council-on-iter-financing/pdf>

## EU Council COREPER AGREED TEXT

**EURATOM** <https://www.consilium.europa.eu/media/47674/st14206-en20.pdf>

**ITER** <https://www.consilium.europa.eu/media/47673/st14217-en20.pdf>

# EU/EURATOM Fission RTD Work Programmes

~ 20%

## Geological disposal

- Decommissioning

~ 40%

## Reactor systems

- Safety of existing nuclear installation (Gen II-III)
- Advanced nuclear systems for increased safety (Gen-IV)
- Partitioning, Transmutation and closed fuel cycle
- Cross-cutting aspects (e.g. fuels, materials, simulation, nuclear data)
- Other applications (e.g. cogeneration, support to Research Reactors)

~ 20%

## Radiation protection

- Non-power applications

~ 20%

Research infrastructures  
Training and mobility  
Cross-cutting INCO

**Grand Total:**  
**Euratom Fission RTD ~ 50 Mi€ / Year**  
**Euratom Fission JRC ~ 50 Mi€ / Year**  
**Total ~ 10 % EU Public&Private**  
**Fission R&D**

# HE-Euratom Call 2021-22 Overview Schedule

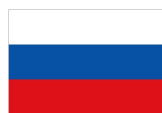
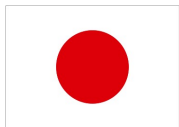
Event	Date
Drafting and Programme Committee WP2021-22 .....	<b>02/2020 – 02/2021</b>
<b>Adoption Euratom 2021-25</b> .....	<b>03/2021</b>
<b>Euratom WP2021-22 publication</b> .....	<b>04-05/2021</b>
Submission Call open.....	<b>15/05/2021</b>
<b>Deadline</b> .....	<b>09/2021</b>
Evaluations .....	<b>10 – 11/2021</b>
Negotiations/Finalisation of Grants .....	<b>01 – 05/2022</b>
Grant Agreement signature.....	<b>06/2022</b>
First projects launched .....	<b>06/2022</b>

**EC Funding and Tenders portal** <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/home>

# Perspectives



- Euratom experience with FP is **a consistent success in pursuing excellence** in nuclear science research and technology
- **Close collaboration between** EC, MSs, OECD/NEA and IAEA, GIF, WNA, International Frameworks agreements
- **Stakeholders structured dialogue** on R&D policy, safety improvements, holistic approach and early involvement in decision making
- **Industry driven ETPs, Fora** are being capitalised





# Conferences' Proceedings FISA 2019 / EURADWASTE '19 ... available!



## FISA 2019 Proceedings

<https://op.europa.eu/en/publication-detail/-/publication/9cfc43f8-cbc7-11ea-adf7-01aa75ed71a1/language-en/format-PDF/source-140481060>



## EURADWASTE '19 Proceedings

<https://op.europa.eu/en/publication-detail/-/publication/fe1b968b-cbc8-11ea-adf7-01aa75ed71a1/language-en/format-PDF/source-140505052>

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[@EuropeanCommission](https://medium.com/@EuropeanCommission)



[EUTube](https://www.youtube.com/EUTube)



[EU Spotify](https://open.spotify.com/EU_Spotify)



## EPJ N Topical issues

- TOPICAL Edition
- AWARDS Selection

<https://www.epj-n.org/>

<https://www.epj-n.org/component/toc/?task=topic&id=1234>

<https://www.epj-n.org/component/toc/?task=topic&id=1169>



**Romanian Presidency of the Council of the EU in 2019 Conferences** <http://fisa-euradwaste2019.nuclear.ro/>

**FISA 2019 Presentations**

<http://fisa-euradwaste2019.nuclear.ro/fisa/>

**EURADWASTE '19 Presentations**

<http://fisa-euradwaste2019.nuclear.ro/euradwaste/>



9<sup>th</sup> European Commission Conference on EURATOM Research and Training in Safety of Reactor Systems  
Pitești, Romania, 4-7 June 2019

# Publications – CORDIS (EC R&D Information Service)

**View all H2020 Euratom projects summaries  
and public deliverables on CORDIS**

**<https://cordis.europa.eu/>**

**H2020 Euratom projects (All)**

[https://cordis.europa.eu/search?q=contenttype=%27project%27%20AND%20\(programme/code=%27H2020%27%20OR%20programme/code=%27H2020-Euratom%27\)%20AND%20\(%27euratom%27\)&p=1&num=100&srt=Relevance:decreasing](https://cordis.europa.eu/search?q=contenttype=%27project%27%20AND%20(programme/code=%27H2020%27%20OR%20programme/code=%27H2020-Euratom%27)%20AND%20(%27euratom%27)&p=1&num=100&srt=Relevance:decreasing)

**... Latest relevant projects summaries !**

# Thank You!

