



IAEA

International Atomic Energy Agency
Atoms for Peace and Development

IAEA Overview on Radiation Science and Technology R&D

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COORDINATED RESEARCH ACTIVITIES

Uniting the World Through Research!



Promoting and coordinating cooperative research (within NA, NE and NS)



Dissemination of information through Reports and Databases, Scientific and Technical Publications



Providing opportunities to scientists in developing and developed countries to work together to solve problems of common interest



*Proven techniques tested and ready to be transferred. **CRPs leading to TC Projects!***

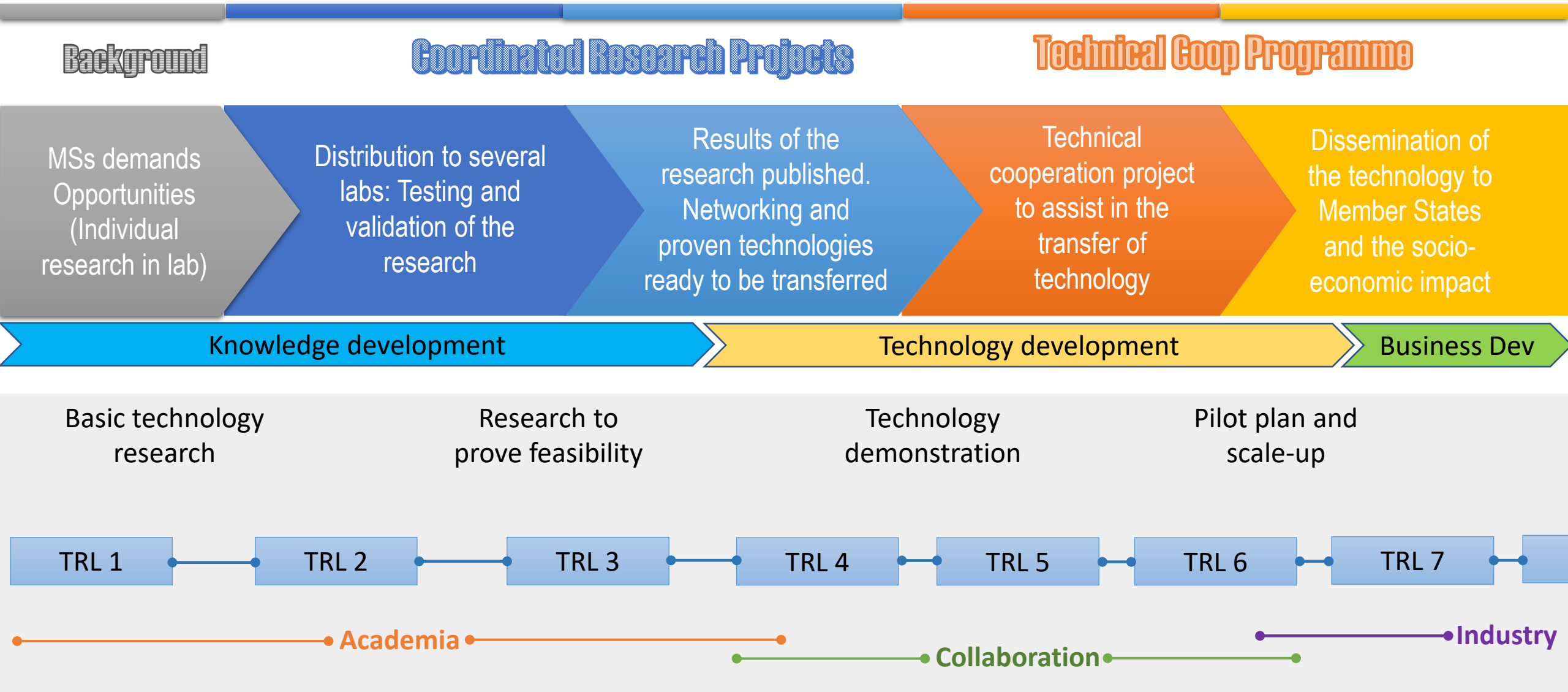
Background

Coordinated Research Projects

Technical Coop Programme


MSs demands

COORDINATED RESEARCH ACTIVITIES




2

Nuclear Energy



0

Water and Environment



2

Food and Agriculture



3

Radiation technology



Health and Nutrition



Radiation safety



CRAs at A Glance



CRPs per Major Programme in 2022

Major Programme	CRPs
Health and Nutrition	10
Food and Agriculture	15
Water and Environment	20
Radiation Safety	25
Radiation Technology	30
Nuclear Energy	35

Statistics

- 144 active coordinated research projects (CRPs)
- 1802 active contracts/ agreements
- 79 Research Coordination Meetings (RCMs)

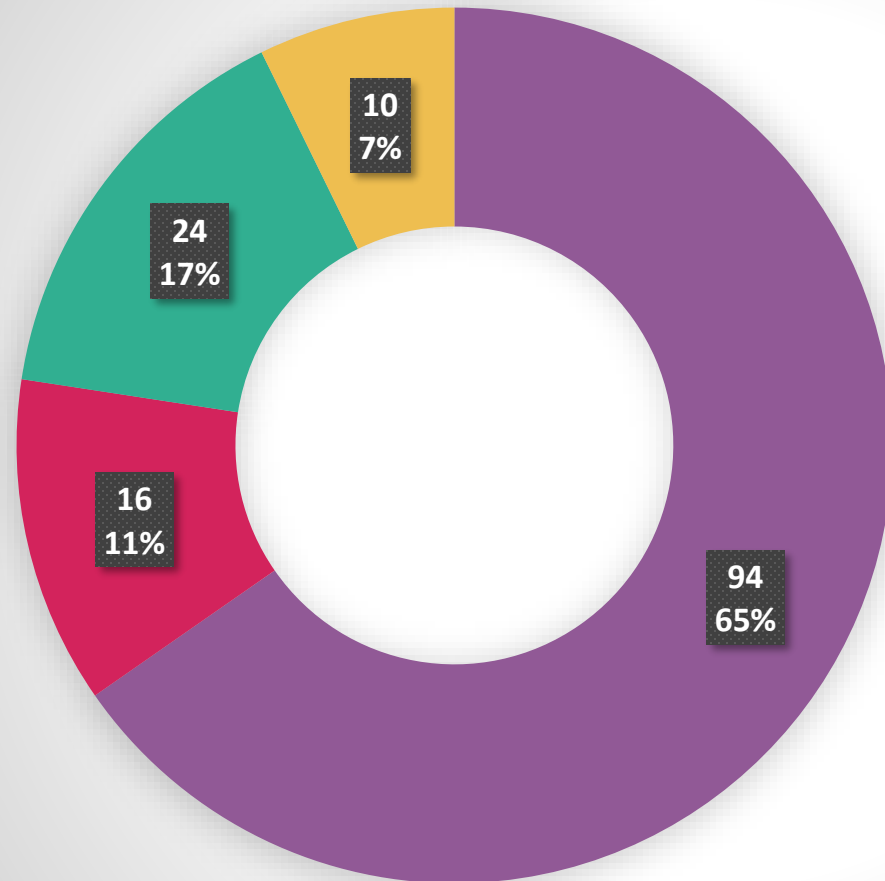
Participation

- 120 Member States from different regions
- 1198 Institutes
- Average duration: 5 years

Funding

- Total IAEA direct CRA expenditure of €7.7 million
- Funding mainly by RB; limited EB resources
- Average award: €7 000/year

CRPs per Major Programme in 2022



- Nuclear Techniques for Development and Environmental Protection
- Nuclear Power, Fuel Cycle and Nuclear Science - Prog 1.4 (NA)
- Nuclear Power, Fuel Cycle and Nuclear Science
- Nuclear Safety and Security

2

0

2

3

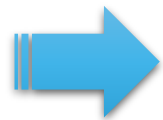
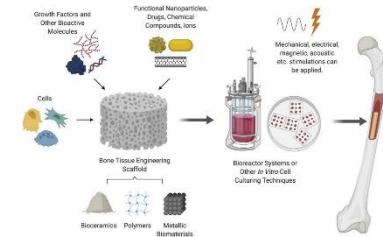


Coordinated Research Projects

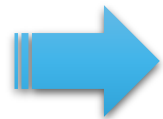
Radiation Processing Technology

Health Applications

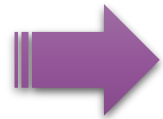
- **Sterilization of Healthcare Products**
 - Decontamination of raw materials
 - Medical Devices, Packaging Materials, Toys
 - Tissue allografts, blood components
- **Advanced biomaterials**
 - Biomaterials, functionalised polymers
 - Nanomaterials for medical and industry



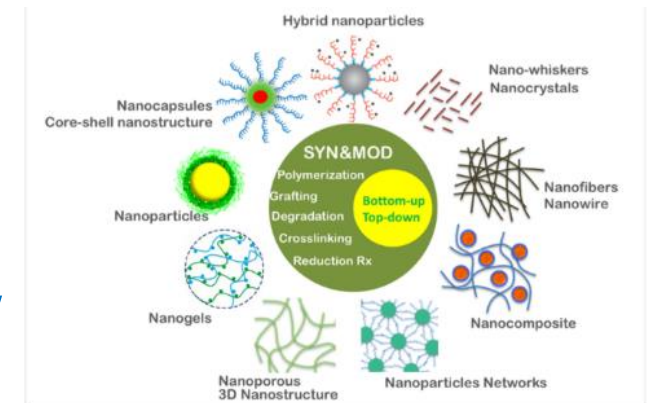
F22070: Enhancing the Beneficial Effects of Radiation Processing in Nanotechnology (2019 -2023)



F23035: Radiation Effects on Polymer Materials Commonly Used in Medical Devices (2021~2025)

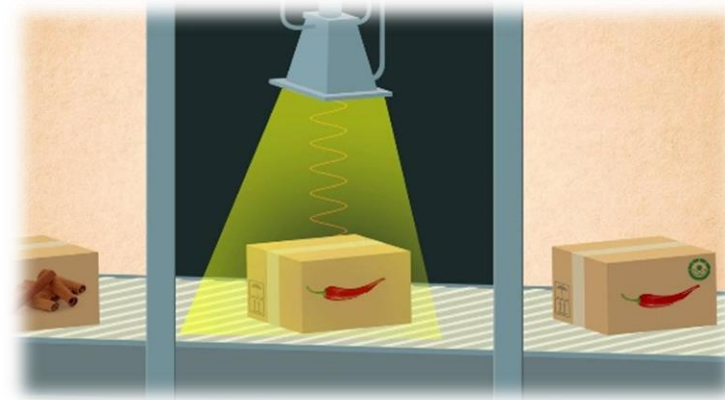


F22079: Biomaterials for sustainable health care (2024~2028)



Food applications (in cooperation with NAFA)

- Irradiation for Sanitary purposes
- Phytosanitary treatment
- Sterile Insect Technique (SIT)
- Surface disinfestation
- Mutation breeding

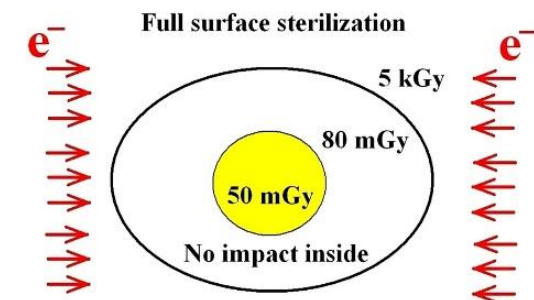


➡ **D24015 Radiation-induced Crop Diversity and Genetic Associations for Accelerating Variety Development**

➡ **D44004 Mosquito Irradiation, Sterilization and Quality Control**

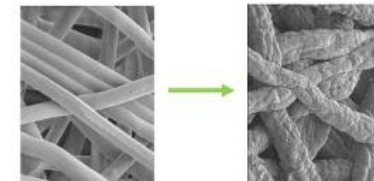
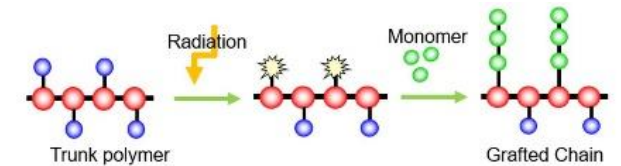
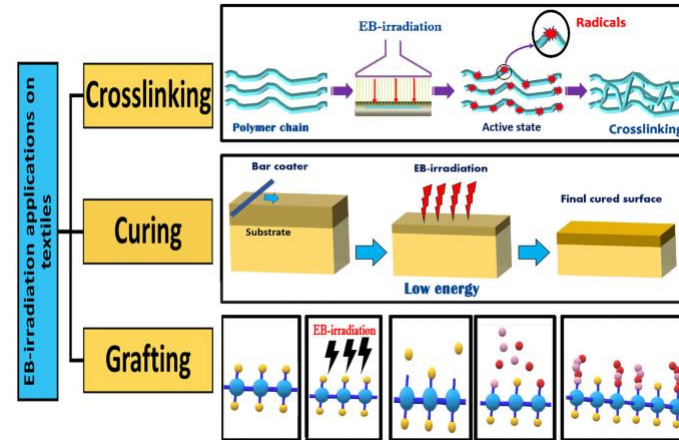
➡ **D61026 Phytosanitary Treatment of Food Commodities and Promotion of Trade**

➡ **D61025 Innovating Radiation Processing of Food with Low Energy Beams from Machine Sources**



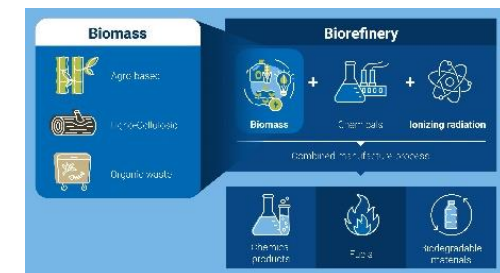
Industrial Application/material science

- **Cross-linking of Polymer**
 - Improve mechanical and thermal property
 - Wire and cable production, Surface Curing
- **Coating/curing on surface**
- **Grafted polymers**
 - Provides new functional properties
 - Heavy Metal adsorbent
- **Degradation of Polymers**
- **Oxidation**
 - Compatibilization



➔ **F22072: Development of Grafted Membrane for Cleaner and Sustainable Energy (2019~2023)**

➔ **F22081: Strengthening the Use of Biomass for Synthesis of Bioplastics and Other Compounds, Using Radiation Technology (2023-2027)**



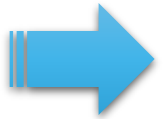
Preservation of Cultural Heritage

- **Disinfection of Cultural Heritage**

- Microbial decontamination
- Controlled biocidal effects

- **Consolidation of Porous materials**

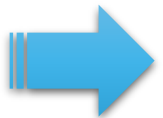
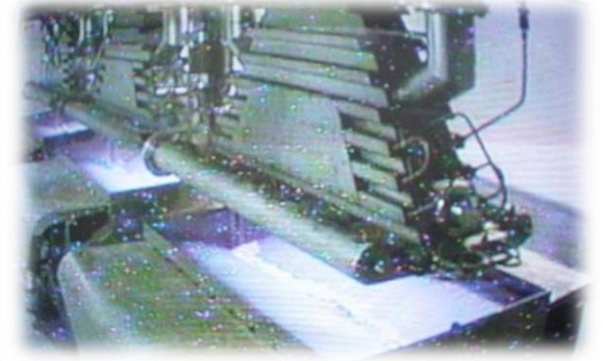
- Improve the mechanical properties of porous material



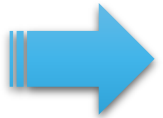
F22082: Development and Implementation of Cultural Heritage Preservation using Ionizing Radiation Technology (2023- 2027)

Environmental Applications

- Flue Gas Treatment
- Industrial Wastewater Treatment
- Sludge Hygienisation
- Upcycling of Plastic Waste



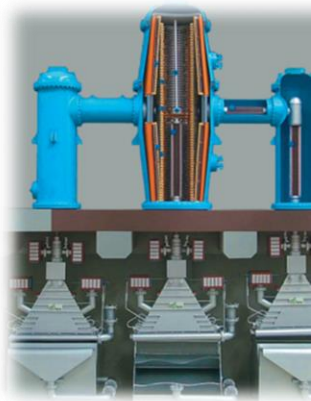
F23033: Radiation Inactivation of Bio-hazards Using High Powered Electron Beam Accelerators (2018 -2022)



F23034: Removal of Emerging Organic Pollutants in the Wastes by Radiation (2019 -2023)



F23036: Recycling of polymer waste for structural and non-structural materials (2021~2025)



Coordinated Research Projects

Radiation Processing Technology

				2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026		
Polymer Modification	Bio-Medical	Tissue Engineering	F23030 (2015-2019)	3rd RCM 02-05 MAY		4th RCM 08-12 APR		Closing 21 Oct	Closing 12.07		Closing 1Q	-----			TECDOC (in progress)	
		Packaging Materials	F22063 (2013-2017)	Closed 30 OCT		TM 20-24 May										TECDOC (in progress)
		Biomaterials for sustainable health care	F22079 (2023-2028)					CM 08-11 NOV	TM 08.29-09.01			1st RCM 2Q	TM 2Q	2nd RCM 2Q	Proposal (2023)	
	Grafting	Membrane for Adsorbent	F23026 (2007-2011)													
		Membrane for Sustainable Energy	F22072 (2020-2024)	TM 07-11 MAY		1st RCM 17-21 FEB		2nd RCM to 2022	2nd RCM 05.16-20	3rd RCM 10.9-13	Closing 1Q	TM 3Q				
	Natural Polymer	Agriculture, Healthcare, Industry & Environment	F22046 (2007-2011)			TM 07-11 MAY		CM moved to 2021	TM 10.11-15	-----						Publication (2017)
		Reutilizing natural polymers	F22081 (2023-2028)					CM 02.16-18	TM 06.13-17	1st RCM 09.11-15	2nd RCM 4Q	TM 4Q	2nd RCM 1Q	Proposal (Dec 2022)		
	Recycling of Polymer	Degradation of polymers	F22039 (2003-2006)													
		Recycling for novel materials	F23036 (2021-2025)	CM 10-13 DEC		TM 01-04 OCT	CM moved 27-30 OCT	1st RCM to 2022	1st RCM 04.04-08	2nd RCM 11.20-24	TM 2Q	Closing 4Q	Proposal 09 SEP 2020			
	Nano-Technology	nano-sized delivery	F22064 (2015-2019)	3rd RCM 02-05 MAY		4th RCM 11-15MAR		Closing 04 DEC 2019								
energy and environemnt		F22070 (2019-2023)	TM 02-06 OCT	CM 16-19 APR	1st RCM 18-22MAR	RCM to 2021 14-18 SEP	2nd RCM 13-17 SEP	TM 08.29-09.01	CM 3.27-30	3rd 1Q Closing 3Q						
Cultural Heritage	preservation/ consolidation	Regin for Restoration	F23032 (2016-2020)	TM 04-08 JUN		3rd RCM 07-11 OCT		Closing 11 NOV	Closing 25 Mar							TECDOC (in progress)
		Implementation of Cultural Heritage	F22082 (2022-2027)			TM moved 16-20 NOV		CM 02.22-26 TM 11.22-26	1st RCM 05.08-12		2nd RCM 4Q	TM 4Q	3rd RCM 4Q	Proposal (Jun 2022)		
Environmental Applications	sludge	Removal of Biohazards	F23033 (2018-2022)	1st RCM 25-29 JUN		TM 08-12 JUL	2nd RCM 02-06 MAR	3rd RCM 11.29-12.03	3rd RCM (V) 1.31-2.04	Closing 1Q						
	water	Emerging Organics	F23034 (2019-2023)	TM 08-12 OCT		1st RCM 04-08 NOV		2nd RCM 26-30 APR	2nd RCM 07.25-29	TM 10.16-20	3rd RCM 4Q	Closing 1Q				
	gas	GHG - Carbon footprint reduction	F22080 (2024-2029)					CM VOCs 04-08 OCT	CM 11.28-30	TM 06.12-16	1st RCM 1Q	2nd RCM 3Q	TM 3Q			
Emerging Application							TM to 2021 09-13 NOV	TM 01-05 NOV	TM 11.21-25	TM 06.12-16	TM 4Q	TM 4Q	TM 4Q			

IAEA COLLABORATING CENTERS

in Radiation Processing Technology & Industrial Technology



Radiation Processing:



Industrial Radiation:



Radiation Processing:



Industrial Radiation:



IAEA COLLABORATING CENTERS

in Radiation Processing Technology & Industrial Technology

			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
Collaborating Centers	MNA (Malaysia)	Ms Marina Bt. Talib												Re-design (09 2019)
	INCT (Poland)	Mr Andrzej Chmielewski												Re-design (06 2020)
	ININ (Mexico)	Ms Luz Maria Moreno Romero												Re-design (12 2021)
	ARTI (Korea)	Mr Namho Lee												Re-design (11 2021)
	NCEBR (USA)	Mr Suresh D. Pillai												Re-design (09 2019)
	NCRRT (Egypt)	Mr Hassan A. AbdEl-Rehim												New (10 2019)
	ARC-Nucléart (France)	Mr Laurant Cortella												New (09 2022)
	CGN (China)	Mr Shijun He												Proposed (10 2022)

IAEA Overview on Radiation Science and Technology R&D



*Promoting and coordinating cooperative research (**academia, scientific organisations, industry**)*



*Dissemination of information through Reports and Databases, Scientific and Technical Publications (**Databases, CRP Reports, Guidance documents, International Conferences**)*



Providing opportunities to scientists in developing and developed countries to work together to solve problems of common interest (CRPs are the best platform for exchange knowledge and experience)



*Proven techniques tested and ready to be transferred. **CRPs are indeed leading to pilot scale prototypes!***

THANK YOU FOR YOUR ATTENTION!

