

As we approach the halfway mark of Mission Innovation 2.0 in 2025 and our anticipated goals in 2030, understanding where we are and how we are doing is more important than ever. The following provides the framework for the 2024 work plan and Key Performance Indicators (KPI) that help illustrate success, challenge and opportunity for the mission and help to view our trajectory towards those 2030 goals.

Mission 2024 Work Plan & Key Performance Indicators – Green Powered Future

Plotting the path to 2030

Mission Innovation Secretariat

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Introduction

Definitions

KPIs have been divided into three categories:

Inputs – What members directly contribute to the Mission – e.g. human resources (FTEs), financial resources, and/or other ways (e.g. data sets, knowledge sharing) that members directly contribute to the Mission.

Outputs – These are the direct products of the Mission – e.g. collaborative or coordinated funding calls, new research collaborations established, reports published, stakeholders engaged, events hosted, or other projects that are *directly* the result of Mission efforts.

Outcomes – These reflect the general activity within the field of the mission on the journey towards the 2030 goals. While some activity may be a direct result of mission activity (which should be highlighted) they are often part of larger global initiatives that align with mission goals and in some cases have been inspired by mission activities. These KPIs help to plot the journey to the overarching mission goals for 2030.

NOTE: This is a living document and will be updated with new information on a regular basis

Section 1 – Key Contacts

Key Contacts

Mission Director: Luciano Martini (Luciano.martini@rse-web.it)

Additional key contacts:

Pillar 1 lead: Yibo Wang (wyb@mail.iee.ac.cn)

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Section 2- Mission Goals & Outcomes

Demonstrate that by 2030 power systems in different geographies and climates are able to effectively integrate up to 100% Variable Renewable Energy (VRE) in their generation mix while maintaining a cost-efficient, secure and resilient system.

Progress Update:

The GPFM has had a significant impact in the international green power sector in the first two years since its launch as part of MI 2.0 in 2021.

To date, the key outputs of the GPFM have been published documents and disseminated information written to inform decision makers about power systems transformation innovation priorities and the funding needed to perform R&I demonstration activities around the world. This information has also served to inform power sector stakeholders about different approaches to common innovation challenges, including successfully implemented innovative solutions, from around the world. It is believed that the GPFM’s activity has started to significantly contribute and influence GPFM members’ national R&I activity, as well as the programme of work of a few global initiatives. As stated in the TAG review report “The GPFM has successfully delivered several outputs following its Action Plan. Those include identification of 100 priority innovation gaps for green power systems, engagement with large demonstration projects in several countries and regions, workshops in partnership with e.g. China and CEM workstreams such as ISGAN, and the publication of the National Pilots Report.” The TAG report also highlighted where the Mission can improve, particularly on engagement. The recommendations were twofold: 1) engage more deeply with stakeholders, including both current members and external organisations/non-member countries, and in particular with private sector stakeholders, to maximise impact through collaboration; 2) increase communication of “knowledge emerging from the mission, answers to questions that were not known before the start of the mission.”

Outcome Indicators:

Indicator	Target	Milestones	Current
Cumulative funding spent	>100 M€/year	-	>570 M€
Number of Innovation Priorities tackled by Mission Partners	50 IPs by 2024 (100 IPs by 2030)	50 more IPs by 2030	50 -
Number of Innovation Priorities addressed by Flagship Projects	50 IPs by 2024 (100 IPs by 2030)	50 more IPs by 2030	50
Number of demo projects underway	>20	-	>70
Number of members actively contributing to the Mission	>75% (>21 out of 28)	-	90% (26)

Regular organization and engagement in Mission ExCo meetings	>4 ExCo meetings/year	-	7+
Regular update of the GPFM progress against the action plan	Periodic Progress Report every 12 months	-	Yes – Annual Report 2023 (Dec. 2023)
External engagement and knowledge dissemination of the Mission outputs	<ul style="list-style-type: none"> • Signature of Collaboration Agreements and/or MoU over a 3-year period Activities on a yearly basis: <ul style="list-style-type: none"> • >2 active contributions to workshops and events with key external stakeholders • >4 posts per month in average on the GPFM LinkedIn • >2 international workshops /year • >5 GPFM related talks at conferences and events • 1 side event organized at CEM/MI • 1 side event co-organized at CEM/MI with other CEM/MI global initiatives • Finalisation and publishing of the Internet-based Platform / GPFM Toolbox 	-	<ul style="list-style-type: none"> - MOU with ISGAN. Close interaction with other leading global initiatives such as the Power Breakthrough - 3-4 posts per month on average on the GPFM LinkedIn, according to specific GPFM engagements (workshops, events, announcements, etc.) - In the last year, METI (Japan) organised an international online workshop; China hosted an international GPFM conference in Yancheng; and we have started the development of an online webinar series for further knowledge-sharing - 1 side event co-organized at CEM/MI annually - Internet-based Platform / GPFM Toolbox under development and due for launch in October 2024 at CEM/MI in Brazil

Section 3 – 2024 Deliverables

2024 – 25 Goals

The GPFM main aim is to launch, and learn from, pilot and demonstration projects to validate innovative solutions allowing power systems in different geographical areas to integrate up to 100% variable renewable energy.

At COP28 in December 2023, 125 countries signed the “Global Renewables and Energy Efficiency Pledge”, committing to triple the world’s installed renewable energy generation capacity to at least 11,000 GW by 2030, clearly indicating that green power is a priority sector for net zero decarbonisation. This multilateral commitment at political level presents an exciting opportunity for the GPFM to put a spotlight on the role of RD&D in driving progress in this area. The GPFM is committed to helping to achieve the goals of the Renewables Pledge, and will work in collaboration with other global initiatives to do so, with a focus on the role of RD&D.

Throughout 2024, the GPFM will monitor the progress of ongoing pilots and demos to collate and then share the main outcomes (e.g. best practices and key exploitable results as well as ‘lessons learned’, risks and challenges) as part of the GPFM Flagship Project 1 “5 demos in five continents” activity. Three Task Forces have been created to oversee the demo activity over a certain continent or geographical area and monitor the projects’ progress. The GPFM is also planning to make available all main pilot project results through an online “toolbox” from which countries can pick and customize innovative solutions as appropriate to their own geographies, system conditions and national strategies. This GPFM knowledge-sharing internet-based Platform is currently under development and entering into the testing phase with the aim of being officially released at CEM15/MI-9 in Brazil. The GPFM will continue to seek other opportunities for knowledge-sharing between pilot projects, including via a new series of online webinars.

For what concerns the GPFM FP2 “Multilateral Research Programme”, consortia that submitted project proposals to the 2023 GPFM-CETPartnership call module and passed the eligibility criteria, according to a two-stage procedure, are invited to submit the full proposal to be evaluated and selected in June 2024 to start their activities in autumn 2024. Moreover, based on the success of the 2023 joint call module, GPFM will launch by Q3 2024 a new joint call module with CETPartnership TRI1 and TRI2 to increase opportunities for international cooperation and boost the GPFM FP2 “Multilateral Research Programme” implementation, focusing on transnationality and involvement of extra-EU countries.

By the start of 2025, the intention is that the internet-based platform will be fully up-and-running; the projects funded through the joint GPFM-CETPartnership call module 2023 will already be underway; and for the GPFM-CETPartnership call module 2024, the full proposal submission phase will be open.

Mission Deliverables

Priority Deliverable – committed	Details	Target Date	Output Category	Lead (Support)
FP1 “5 Demos in five Continents” Continental Task Force activities: progress monitoring and knowledge sharing	The GPFM set up 3 continental Task Forces to monitor pilots and demos progress and to share relevant information and results by involving project coordinators and updating the info with respect of the National Pilots Report released in Goa in July 2023. Each task force oversees the demos activity over a certain continent or geographical area	Q1-Q4 2024 Main outcomes to be presented at CEM15/MI-9	<i>Stakeholder engagement Collaboration and knowledge sharing</i>	Task Forces Leads: TF I Asia: China & India TF II Europe: Italy & Spain TF III: Australia & Italy
FP2 “Multilateral Research Programme” Joint GPFM-CETP call module 2024	Based on the success of the joint GPFM-CETPartnership call module 2023, to launch by Q3 2024 a new call module aiming to increase opportunities for international cooperation and boost the	Call opening – September 2024	<i>Collaborative Funding Calls</i>	Italy (including CETP TRI leads) FP2 Task Force

	GPFM Flagship Project 2 implementation.			
Launch of the online ‘toolbox’ GPFM knowledge-sharing Platform	An internet based platform which will serve as a depository for all information relevant to GPFM members, as well as a collaborative space to enable VRE innovation.	Official launch at CEM15/MI9 in Brazil, Oct 2024.	<i>Collaboration and knowledge sharing</i> <i>Stakeholder engagement</i>	China / co-leads
Release of GPFM Annual report 2024	The Annual Report will provide an update on progress against the GPFM Action Plan 2022-2024 with a focus on the year 2024.	Q3-Q4 2024	<i>Report</i>	UK / co-Leads
Private Sector Engagement workshops	Bringing together private sector stakeholders to provide input on the sector’s needs and propose new activities/collaborations. Formation of an advisory board to ensure that the Mission is pursuing activities that align with the needs of emerging power sector innovations in the market so that it can better support, enable and scale those technologies.	Q2-Q3 2024	<i>Stakeholder engagement</i>	MI Secretariat/co-leads
Action Plan 2025-2027	The GPFM will seek to further develop and deploy innovative solutions in line with the innovation priorities identified and will strive to address more than 70% of the innovation priorities by 2027. The replicability and scalability of the validated innovative solutions will be in focus.	Q4 2024	<i>Report/ Work Planning document</i>	Italy/ co-Leads
Series of online seminars to reinforce GPFM knowledge sharing approach	To plan and organize a series of online webinars and workshops on GPFM pillars-related relevant R&I themes. Intention is 1 per quarter, or more if there is enough interest.	Starting Q3 2024	<i>Knowledge sharing</i>	UK / co-Leads
2 nd Yancheng International Workshop “MI Green Power Innovation Conference”	Organisation of an Annual event to engage with GPFM coalition members and in particular, with Asian and	Q3 2024	<i>Knowledge sharing</i>	China/ co-Leads

	international stakeholders. Policy and technical sessions about key innovation priorities will be also included.			
Factsheet on key indicators for power sector for the GPFM (in collaboration with Joint Research Centre)	The factsheet will consolidate information from relevant organisations, such as IEA and IRENA, about the trends in the GPFM's focus areas such as renewables, smart grids, storage etc. It will be a valuable resource for GPFM stakeholders and will help inform decision making	Q2 2024, in time for dissemination at MI Annual Gathering	<i>Knowledge sharing Stakeholder engagement</i>	
Stretch Deliverable (Would like to do)	Details	Target Date	Output Category	Lead (Support)
Release of GPFM Progress Report on the '5 demos in five continents' Flagship Project	This Report will showcase the main progress of the 80 national pilot projects described in the National Pilots Report.	Q2 2025	<i>Report</i>	Italy / co-Leads
Established interaction & collaborations with African countries	With the support of IRENA, the GPFM will explore collaboration opportunities with African countries in order to be aware of and possibly address Africa-related R&I needs and grid Innovation Priorities	Q1-Q4 2024 and beyond	<i>Collaboration</i>	Italy/ co-Leads
Factsheets with case studies and key recommendations on the identified GPFM Innovation Priorities	Documents on specific Innovation Priorities to showcase main achievements from national pilots	Releasing 3-4 factsheets at CEM15/MI-9	<i>Report</i>	Italy/ co-Leads

Section 4 – Mission Inputs

Human Resources

The following table reflects the input provided by Mission members. In some cases, the FTE figures refer to individuals contributing to the day-to-day running of the Mission (mostly the co-leads); in other cases, these figures refer to individuals working on national pilot projects presented via the ‘5 demos in Five continents’ GPFM Flagship Project. Future iterations of this workplan will include disaggregated figures.

Country/Partner	Government Officials(*)		Contracted Technical Experts		Roles & Responsibilities
	Planned	Actual	Planned	Actual	
China	0.5	0.2	2.0	2.0	GPFM co-Lead: provides Pillar 1 Lead, Task Force/ Asian demonstration Lead. Host and organize GPFM Webinar and the 2024 MI Green Power Innovation Annual Conference
Italy	0.5	0.5	3.5	4.5	GPFM co-Lead: provides Mission Director, Pillar 2 Lead, EU and Australia-N. & S. America Task Forces co-Lead, Communications Team. Strategic co-leadership on definition of key objectives for GPFM International workshops and events at Ministerial meetings & COP. Drafting and releasing of GPFM main documents, setting up of dedicated surveys and elaboration of related outcomes
UK	1.0	1.0			GPFM co-Lead: provides Pillar 3 Lead. Contributes strategic co-leadership including input to strategy development, Mission outputs, communications and activities. Organisation of webinar series. Contributes technical expertise and knowledge-exchange.
Australia			15 (overall)	15 (overall)	Shaping Mission goals and ensuring alignment. Communication of Australian programmes progress and promoting collaboration with aligned international activities. Assessed based on two key aligned activities: - UK/US/AU - New global research centre - The Electric Power Innovation for a Carbon-free Society (EPICS) Centre (\$5.6M AUD for Australian component) https://www.csiro.au/en/news/all/news/2023/september/australian-institutes-spearhead-global-efforts-in-clean-energy-innovation - International Clean Innovation Researcher Networks - supporting integration of renewable energy & electric vehicles into the electricity grid. \$5.5M AUD grants supporting \$9M research programs. https://www.dcceew.gov.au/about/news/innovation-researcher-network-grants
India					
Saudi Arabia					

Spain	0.5	0.5	0	0	Participation in the mission activity in collaboration with the Spanish technological platforms in the energy field. Co-leadership (with Italy) of Task Force II for the identification and monitoring of pilot projects in the European area (as a contribution to the Flagship Project 1: 5 Demos in Five Continents NATIONAL PILOTS REPORT)
IRENA					
World Bank Group					
Alperia SpA	0.5	0.1	2.0	XX	Planned FTE are linked to the future national pilot project: project managers and technicians will be involved to develop and manage it. Also by participating in the Task Force II Europe activities.
Areti SpA					
Enel Grids	0.5	0.5	0	0	Executive Steering Committee, participation in webinar and events, contribution for PM publications
National Grid Group			1	1	Provide support to mission secretariat. Liaise with the rest of National Grid to ensure input into mission workstreams in a timely manner.
Icebreaker One			1	1	Provide support to the general running of the Mission. Non-profit organisation so resources are small.
LONGi	-	-	1.0	1.0	Provided project key expertise
Goldwind	-	-	1.0	1.0	Provided project key expertise
Austria	0.1	0.1	0.2	0.2	GPFM representative, national stakeholder engagement
Brazil	2.0	2.0	-	-	As a GPFM Support Member, Brazil provides relevant information about planned national pilot projects when required
Canada	1.5	1.5	0	0	As a support/tier 2 member of the GPFM, Canada has not made a formal FTE contribution to the Mission. However, Canada has provided substantive resources to date to support contributions to the Mission (i.e. at Mission meetings, events, written products, and other activities), including from NRCan's CanmetENERGY Varennes laboratory and the Office of Energy Research and Development. FTE resources provided may increase in the future, especially in supporting Canada's contributions to FP1.
European Commission	0.1	0.1			Participate to meetings, follow-up documents, give presentations etc.
Germany		0.25			GPFM representative
Japan					
Republic of Korea					
IEA					
BSI					GPFM representative. Engagement has been very low.
ENA					GPFM representative. Engagement has been very low.
GSE					

TERNA			0.2	0.2?	Provide Energy Systems Innovation expert for the Support Team contribution to ExCo meetings and task force.
Total					

(*) Government Officials or international Organization/Industry Representatives

Human Resource Gaps/Needs

Government Officials		Contracted Technical Experts		Activity at Risk	Key Contact
Planned	Actual	Planned	Actual		
1.0				Solicit coalition members to intensify their engagement to GPFM activity. Reconnecting with them to re-establish their desire to be involved with the GPFM is necessary. Someone (possibly from MI Secretariat) who can focus on engagement with members and external stakeholders would be a 'nice to have'.	

Funding/Financial Resources

The following table reflects the input provided by Mission members. In some cases, the figures refer to funding put towards the day-to-day running of the Mission; in other cases, these figures refer to funds allocated to national pilot projects and R&D funding programmes. Future iterations of this workplan will include disaggregated figures, and will include data collected from all members.

Country/Partner	Public Funding (\$)		Public/Private	Description
	Planned	Actual		
Co-Leads				
China	RMB 8mln	RMB 8mln	Public	Implementation of Asian Demonstration, development of the GPFM Internet Platform and MI Green Power Innovation Conference
Italy	€ 5mln	€ 5mln	Public	Coordination and strategic planning of GPFM activity, together with other co-Leads. Leadership and responsibility as Mission's Director and Pillar 2 Coordinator. Launching of Italian pilot and demonstration projects by means of open calls. Creation of content for showcasing and disseminating the GPFM main outcomes related to Flagship Project 1 and 2. Monitoring Key Exploitable Results from Italian and other pilot projects as part of the Flagship project 1 – Task force II Europe.

				Setting up GPFM strategic collaborations with selected international initiatives such as ISGAN, 21CPP, 3DEN, etc.
Italy	€ 60mln	€ 60mln	Public	MI dedicated funding to support national pilot projects covering the most urgent Innovation Priorities identified in the GPFM action plan. The funded projects will contribute to the Flagship Project 1 by sharing demonstrated innovative solutions with GPFM members and beyond, also by means of the GPFM toolbox.
UK	~€150 mln	~€150 mln		Delivery of the UK's National Pilot Projects: the Flexibility Innovation Programme and the Longer-Duration Energy Storage Programme, both of which are innovation funding programmes under the UK government's 'Net Zero Innovation Portfolio', and which focus on 14 innovation priorities across all 3 R&I pillars.
Core Team				
Australia	AUD (pa) \$ 3mln	AUD (pa) \$ 3mln	Public	Combination of Australian research & international collaboration activities. Note that these are direct costs aligned with these international efforts. Australian projects underway with results being shared are ~\$3B AUD, including - \$176M AUD support for deployment of 8 large scale grid forming inverters within Australia's National Energy Market (approx \$2.7B AUD total project cost). https://arena.gov.au/blog/arena-backs-eight-big-batteries-to-bolster-grid/ - Community Batteries for Household Solar program - \$200M AUD support for 400 community-based batteries. https://www.dcceew.gov.au/energy/renewable/community-batteries
India				
Saudi Arabia				
Spain	€ 25k	€ 25k	Public	Development of a web repository to share and coordinate activity in the Mission; holding coordination meetings between interested parties (including the Spanish technological platforms and public agents of the ministries interested in the mission)
IRENA				
World Bank Group				
Alperia SpA	€ 20k	€ 20k	Private	Support to GPFM communication and dissemination activities
Areti SpA	€ 20k	€ 20k	Private	Support to GPFM communication and dissemination activities
Enel Grids	€ 10k	€ 10k	Private	Support to GPFM communication and dissemination activities
National Grid Group	-	-	-	-
Icebreaker One			Non-profit	No funding input.
LONGi	RMB 5mln	RMB 5mln	Public RMB 5million Private RMB 12.5 million	The project funds are used for project research and development, including equipment procurement, material procurement, conference expenses, and personnel incentives

Goldwind	RMB 5mln	RMB 5mln	Public RMB 5million Private RMB 12.5 million	Project funds are used for project research and development, including equipment costs, material costs, conference costs, travel expenses
Support Team				
Austria				
Brazil	-	-	-	-
Canada	0	0	N/A	Canada is not currently providing financial resources directly to the Mission, as a Tier 2/Support member. NRCAN is planning to provide additional grant funding to an NRCAN-funded smart grid project, to support that project's international engagement with the GPFM and its members. Detail on this upcoming contribution will be provided in Section 5 of the workplan.
European Commission	-	-	-	-
Germany	-	-	-	-
Japan				
Republic of Korea				
IEA				
BSI			Private	No funding input.
ENA			Private	No funding input.
GSE				
TERNA			No	No
Total				

Funding/Finance Resource Gaps/Needs

Public Funding (\$)		
Planned	Actual	Activity At Risk
		With additional funds, the Mission could expand the ambition of its work program, including joint funding calls to identify exciting new innovative technologies in the green power sector. Could also increase strategic engagement with other countries and global organizations and initiatives (see stakeholder engagement section below). If the GPFM is to help in achieving the COP28 Pledge to triple renewables, increased global engagement is needed with other initiatives, private sector, potential members and regions not currently represented in the membership (e.g. Africa, ASEAN)

Other In-kind Contributions

The following table reflects the input provided by Mission members. In some cases, the information refers to activities related to the Flagship Projects; in other cases, the information refers to other activities including event planning and knowledge transfer initiatives. Future iterations of this workplan will include disaggregated information and will include information collected from all members.

Country/Partner	Planned Activity	Impact
Co-Leads		
China	From 2024-2025, based on the "Green Power Future" mission cooperation project, develop technological consultation reports in line with over 30% of the innovation priorities of Pillar1 Renewable Energies; continuously establish testing platforms or demos for extra-large wind turbine, 1 MW novel PV cell, \pm 30 kV full-DC-link power system, and a monitoring system for the ecological environment impact of PV system in marine climate; and to develop the GPFM internet platform and put it into service.	By synergy among project partners, promote technology innovation and multilateral cooperation under GPFM.
Italy	<ul style="list-style-type: none"> Italian MASE & RSE will coordinate the activity to develop and release high-level R&I documents (e.g., Action Plan 2025-2027, National Pilots Progress Report). As in the past, Italy will directly engage in defining the main objectives and outcomes of high-level events at both CEM Ministerial and COP29. Italy will coordinate with China for the seamless incorporation of the Smart Grids Innovation Accelerator (SGIA) platform within the GPFM Toolbox. As contribution to FP1, MASE, with the scientific support of RSE, will launch competing funding calls to support pilot and demo projects addressing GPFM relevant R&I topics. 	<p>Based on the new Ministerial Decree to support Italian activities in the framework of Mission Innovation, in 2024 competing calls to support national pilot projects will be launched. GPFM Italian members and all national stakeholders will be allowed to submit proposals to be evaluated and possibly granted. The funded pilot projects will have great impacts also beyond the demonstration of innovative solutions.</p> <p>Moreover, the GPFM will facilitate the broad dissemination of pilot projects' results at international level, allowing project partners and stakeholders from other GPFM countries to exchange knowledge and benefit from it. The dissemination of project results, thanks to workshops and webinars organised by the GPFM, will provide policymakers with valuable insights about the most relevant innovative solutions to be considered in future energy policies.</p> <p>GPFM strategic documents and technical reports will draw a pathway to guide R&I investments and national energy policy, as well as promote international cooperation towards clean energy modernization and decarbonisation.</p> <p>The development and use of the SGIA platform enables the sharing of technical results and best practices, fostering collaboration between the public and private sectors towards the goals of accelerate the development and deployment of innovative smart grid technologies on a global scale.</p>

UK	<p>Knowledge shared from domestic innovation programmes (Longer Duration Energy Storage Programme, LODES, and the Flexibility Innovation Programme), both of which are innovation funding programmes under the UK government's 'Net Zero Innovation Portfolio'.</p> <p>Technical leads have also shared knowledge on the development of UK standards for domestic demand-side response (DSR), including at the in-person workshop organized in Yancheng, China, in October 2023.</p> <p>Technical leads will also be contributing to knowledge sharing activities throughout 2024, including at the 2-day online workshop organized by METI, Japan, and via a series of online webinars, which the UK is organizing.</p> <p>The UK also developed the GPFM's 2023 Annual Report, and the UK's Senior Representative for Mission Innovation presented this at the official GPFM side event at COP28 in 2023.</p>	<p>The UK will be taking a more active role in leading the Mission in 2024 to help ensure its outputs and activities generate maximum impact, including through participating in and driving knowledge exchange and stakeholder engagement, including with the private sector, and links with other initiatives in this space such as GGI (for which the Secretariat is UK-based).</p>
Core Team		
Australia	<p>Australian initiatives aligned with GPFM with results shared as part of international collaboration activities.</p> <p>Australian projects underway with results being shared are ~\$3B AUD, including - \$176M AUD support for deployment of 8 large scale grid forming inverters within Australia's National Energy Market (approx \$2.7B AUD total project cost). https://arena.gov.au/blog/arena-backs-eight-big-batteries-to-bolster-grid/ - Community Batteries for Household Solar program - \$200M AUD support for 400 community based batteries. https://www.dcceew.gov.au/energy/renewable/community-batteries</p>	<p>Lessons from a system with very high distributed renewable energy resources shared with international researchers and system operators. Australian electricity system transformation accelerated with information shared by international collaborators.</p>
India		
Saudi Arabia		
Spain	<p>Exchange of information with/from technological platforms and companies (e.g. to monitor pilot projects)</p> <p>Presentation of GPFM activity and challenges in seminars and fairs related to innovation in Spain (e.g. "GENERA", "TRANSFIERE", etc</p>	<p>Dissemination of GPFM activity and potential attraction of interest from companies and public organizations in alignment with the challenges and activities identified in GPFM</p>
IRENA		

World Bank Group		
Alperia SpA	Activities will be planned and structured based on the publication of the Ministerial Decree and the actual opening of the competing calls that will allow to allocate funds on national pilot projects.	
Areti SpA	Activities will be planned and structured based on the publication of the Ministerial Decree and the actual opening of the competing calls that will allow to allocate funds on national pilot projects.	
Enel Grids	Best practice from innovative projects. Activities will be planned and structured based on the publication of the Ministerial Decree and the actual opening of the competing calls that will allow to allocate funds on national pilot projects.	Knowledge sharing
National Grid Group	Continuing updates on the pilot projects and potential knowledge shares from wider National Grid team	Continue to meet GPFM goals and targets
Icebreaker One		
LONGi		
Goldwind		
Support Team		
Austria		
Brazil	-	-
Canada	Active knowledge sharing on project outcomes from previously funded smart grid demonstration projects, until newly funded project(s) are identified. Continued engagement and knowledge sharing through Mission, including at the ExCo and Task Force levels, as well as at Mission events.	Other members of the Mission are able to learn from projects and experiences related to GPFM Innovation Priorities in the Canadian/North American context.
European Commission	Presentation at events by RVV, presentation and discussion on mission with the CETP by MG and PH	
Germany	Participation in FP1 and FP2; FP1: monitoring of projects; participation in knowledge exchange; FP2 with CETPartnership: funding of selected projects in joint call 2023; participation in joint call 2024	Establishment of an international funding network and a network of projects; exchange of knowledge between projects to improve the portability of concepts
Japan		
Republic of Korea		
IEA		
BSI		
ENA		

GSE	Activities will be planned and structured based on the publication of the Ministerial Decree and the actual opening of the competing calls that will allow to allocate funds on national pilot projects.	
TERNA	Technical contributions to workshop and/or reports on topics related to System Operations, knowledge sharing on Terna Innovation Roadmap to GPFM members, evaluating participation in proposals to be submitted for the calls that the Italian government will release in 2024	MI members gain a deeper knowledge on the challenges of the future Italian power grid, potential added value from the comparison between Terna's innovation roadmap and that of GPFM, contribution to proposal to be submitted for the Italian government calls to be released.

Intangible Resource Gaps/Needs

Activity at Risk	Impact
Strategic global engagement	If the GPFM is to help in achieving the COP28 Pledge to triple renewables, increased global engagement is needed with other initiatives, private sector, potential members and regions not currently represented in the membership (e.g. Africa, ASEAN)

Section 5 – Outputs

Collaborative and Coordinated Funding Calls

Funding Call	Public Funding		Private Funding		Description and Link to Mission Goals	Results of the funding call (when known)
	Expected	Actual	Expected	Actual		
Joint GPFM-CETPartnership call module 2024	TBD		TBD		After the successful joint call module 2023, the GPFM and the CETPartnership agreed to launch a joint call module 2024, aiming to increase opportunities for international cooperation towards the implementation of the GPFM Flagship Project 2 (FP2) “Multilateral Research Programme”. This joint call module, in line with the 2023 one will address key innovation priorities as identified by the GPFM – CETPartnership joint effort among the 100 highlighted in the GPFM Roadmap.	The new call module will be launched in Q3 2024 aiming to similar or better results as compared to the 2023 joint call module.
Natural Resources Canada (NRCan)	\$ 150,000 CAD	TBC	N/A	N/A	Leveraging the ongoing Energy Innovation Program Smart Grid Call, NRCan intends to	Results TBC. Grant expected to be awarded in autumn 2024.

Energy Innovation Program - MI GPFM Grant						launch a competitive grant process to award one successfully funded Canadian smart grid project with a dedicated grant to support that project's international engagement and collaboration with members of the MI Community as the GPFM's North American Demo project	
Australian Power System Transformation Research Program	\$ 3M	TBC	In-kind tbc	tbc		Funding call (RFQ) ~March 2024 for research work programs underpinning electricity power system transformation in Australia	Collaborative research with AEMO (Australian System operator), with outputs including reports, presentations, data sets etc.
Total							

Research Collaborations and Knowledge Sharing Communities

Planned Research Collaborations Facilitated			
Partner Countries/Org	Area of Focus	Benefit to Mission	Status
China in collaboration with GPFM members	Knowledge sharing Platform for the dissemination of the Mission's main results from FP1 and FP2	The GPFM Internet Platform aims to establish cross-border collaboration and to provide a high-level open dialogue space to promote technical innovation and wide-scale application of GPFM's achievements. The platform integrates six modules, including Experts Workplace, Information Release, Demonstration Projects, Smart Grids Innovation Accelerator (SGIA), Multilateral Research Program, and Experts Think Tank.	Advanced demo version of the GPFM Toolbox was announced and presented at the GPFM side event at COP28 in Dubai
Italy – SGIA	Platform that gathers key documents, information, data, best practices and project results in the field of smart grids	Creates a favorable framework to launch feasible projects/initiatives. Enables the sharing of technical results and best practices for the acceleration of the development and deployment of innovative smart grids technologies worldwide.	Launched in the framework of IC1.
All Members & wider network / interested parties	GPFM Seminar Series	Knowledge exchange – allowing pilot project leads (responsible for projects listed under the '5 demos in five continents' Flagship Project) to share progress updates, seek feedback and answer questions	Planning stage

Aust/UK/US	Elec Power System Transformation	Collaboration to share lessons from system operators with very high penetrations of renewables, including distributed renewables.	International Researcher Networks program established/funded ~dec 2023. EPICS Global Centre, launching early 2024.
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Events and Reports

Event/Report Title	Description	Date	Reach	Results
2-day online workshop by METI/ Japan	The workshop will focus on Policy and Technology for Grid Flexibility and Stability	12-13 March 2024	More than 100 participants remotely	Knowledge exchange and best practices sharing in the field of Grid Stability and Flexibility
GPFM Private Sector engagement workshop	As successfully accomplished in 2022, the Mission aims to organize the second private sector engagement workshop in early 2024	Q2 2024		Better understanding of the needs and challenges of the private sector and creating of an Advisory Board
MI Green Power Innovation Conference by IEE CAS	Second workshop in Yancheng, China to disseminate GPFM demo projects' results and facilitate knowledge-sharing at a technical level	Q3 2024	More than 300 experts and scholars from China, Italy, the UK, Japan, India, Sweden, Denmark, and other countries + IEA contributions attended the 2023 event.	Further strengthen collaboration among GPFM members and in particular, within Asian Demonstration Project
Report Series on GPFM Global Innovation Priorities	Technical review and trend analysis on IPs	Q3 2024	In 2023: release executive summary drafts on novel PV cell, reliability of emerging PV, off-shore wind, and novel wind power on COP28-GPFM side event	Release two or more reports on GPFM related activities
Joint event with ISGAN	Joint event to showcase the ongoing fruitful collaboration between MI GPFM and CEM ISGAN	CEM15/MI-9	More than 50 participants on site and 100+ participants remotely (if livestream will be available)	Further strengthen the collaboration between the two initiatives. Demonstrate how innovation and deployment of clean technologies in the power sector, driven/facilitated by the GPFM and ISGAN, are contributing to delivery of the COP28 Renewables Pledge.
GPFM dedicated event	A dedicated GPFM event to showcase the progress of the Mission and its related	CEM15/MI-9	More than 50 participants on site and 100+ participants	Gain more visibility during the Ministerial. Reiterate the important role of R&I activities and commitment of

	activities and the release of the National Progress Report		remotely (if livestream will be available)	GPFM towards power system transformation and to delivering the COP28 Renewables Pledge.
GPFM event at COP29	A dedicated GPFM event to showcase the progress of the Mission and its related activities and the release of the Annual Report 2024	Nov. 2024		Active discussion and knowledge exchange between coalition members' countries, progress towards FP1 and FP2. Showcase of the progress in green power innovation that the GPFM has made towards achieving the COP28 Renewables pledge.
Annual Report 2024	The Annual Report will provide an update on progress against the GPFM Action Plan 2022-2024 and especially for the year 2024.	Q4 2024	Several downloads from MI website and LinkedIn	Increasing visibility of the impact of the GPFM by highlighting key activities from across 2024, including the achievements of the Flagship Projects. Showcase of the progress in green power innovation that the GPFM has made towards achieving the COP28 Renewables pledge.
National Pilots Progress Report	The National Pilot Progress Report will showcase main trend and progress of the 80 national pilot projects described in the National Pilots Report.	Q2 2025	Several downloads from MI website and LinkedIn	Showcase GPFM main achievements, e.g. recent progress of the 80 national pilot and demo projects, or multilateral research activities in collaboration with the CETPartnership.
Series of technical webinars	Organisation of a series of online workshops focusing on relevant R&I topics	Monthly from June 2024	All members & wider network	Knowledge exchange and best practices sharing among national pilot project leads. Potential to further strengthen collaboration among GPFM members.

Stakeholder Engagement

Key Stakeholders	Objectives & Intended Impact	Results
Digital Demand-Driven Electricity Networks (3DEN)	Addressing digitalization as a key step for the future energy system decarbonization.	Mutual participation and active contribution to the events organized during Ministerial meetings and COP. Knowledge exchange considering the outcomes of the pilot projects.
International Smart Grid Action Network (ISGAN)	Jointly addressing topics related to electricity grids innovation and accelerating clean energy uptake. Work together on R&I priorities which will deliver the COP28 Renewables pledge.	Deepen the collaboration considering the foreseen activities stated in the GPFM-ISGAN Memorandum of Understanding and continuing to organize joint workshops at Ministerial meetings to address power system transformation and modernization.
21 st Century Power Partnership (21CPP)	Accelerate the global transformation of power systems with a focus on technology innovation and	Joint events at Ministerial Meetings together with ISGAN and global power sector initiatives, dealing with power system transformation

	implementation, policy, and regulatory actions towards delivering on the COP28 Renewables pledge.	
Power Breakthrough	Identify new system-wide innovations and large-scale demonstration projects, in order to accelerate delivery and share lessons. Work together on R&I priorities which will deliver the COP28 Renewables pledge.	Contribution to P3 Research & innovation and P4 Infrastructure, knowledge, capability & skills, as well as to the Power Sector Landscape Map. Knowledge exchange
In addition to the abovementioned initiatives, GPFM has in the pipeline to exploring additional potential stakeholders listed below:		
APRA/IRENA	Explore possible collaborations and discuss about R&I needs and grid Innovation Priorities for African countries. Expansion of GPFM activities into Africa will accelerate delivery of the COP28 Renewables pledge.	The first call with IRENA/APRA representatives has been held. Both initiatives committed to explore possible collaborations (future meetings and joint workshops, webinars, pilot projects, etc.)
AUDA-NEPAD	Explore possible collaborations (future meetings and joint workshops, webinars, pilot projects, etc.) and discuss about R&I needs and grid Innovation Priorities for African countries	Plan to deepen the interaction after the first interaction at COP28.
Swiss Representatives	Explore possibilities to take part in the Mission Activities	First introductory call to present the Mission, its activities and to discuss on possible CH involvement in GPFM.
Green Grids Initiative	Establish productive partnership to accelerate the construction of new infrastructure needed for a world powered by renewable energy and deliver the COP28 Renewables pledge.	Early stages of engagement

Section 6- Demonstrations

The full list of National Pilots is available in the [GPFM National Pilots Report](#). In the following a few pilots as exemplary are reported:

Name	Description	Funding (\$ and where from)	Expected Outcomes and Impact to Mission	Stage (i.e., Concept/ Design/ Deployed)
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Advanced PV Technology Verification Project (China)	Based on BC technology, establish a 1MW photovoltaic empirical verification platform. And conduct actual power generation performance verification research based on platform monitoring data.	User investment	Establish and analyze an empirical verification platform simulation model for photovoltaic modules, develop an optimized design and overall design scheme for the empirical platform, carry out empirical platform construction and actual power generation performance verification research, and achieve system monitoring and optimization.	Design
Large-Scale Nacelle Drivetrain Test Bench with 6-DOF (China)	With six degrees of freedom loading capability, simulates the real load condition of the wind turbine in the field	RMB 260 million self-financing and state funding	1. Research on experimental ability of loading with six degrees of freedom 2. The reliability of wind turbines is improved Wind turbine test bench demonstration project	Deploying
15MW Medium Voltage Grid-forming Solar PV and Energy Storage Demonstration Project	Consisting of rooftop solar PV, energy storage system, medium voltage DCDC converter, and MMC, this project is demonstrating an innovative method for developing a solar PV power plant.	User investment	1. Testing and demonstrating the performance of the medium voltage DCDC converter. This project will contribute the marketization process of the converter; 2. Exploring medium voltage DC grid forming techniques in both theory and engineering perspectives; Providing substantial carbon footprint for the local industrial complex.	Design
(Alperia #1 – Italy) Energy Flexibility in mountain regions	The project implements several different topics: - Flexibility potential of hydropower plants thanks to new algorithms and storage solutions - Power-to-mobility and power-to-x solutions to test flexibility from sector integration - Floating PV plants to be installed in existing water basins, combined with self-consumption schemes - Grid infrastructure flexibility and improved grid management	8-12 M€ - co-funded	Test overall system flexibility objectives and solutions in mountain regions	Concept

<p>(Areti #2 - Italy) Smart Charging and V2G Tools involving all Electrical Vehicles while focusing on EVs for Public Transportation to foster Grid Operation Optimization</p>	<p>The Project aims to develop at a very high maturity level effective and efficient tool to enable a positive interaction between charging stations for all kind of EVs (cars, trucks, buses,...) making them a primary source of demand response services to optimize the Rome's distribution grid operation.</p>	<p>20 M€ - co-funded</p>	<p>Strengthening the electrification of public transport thanks to: 1. the integration of big charging stations for buses into the flexibility mechanisms of the Areti's grid 2. the exploitation of the "Areti Smart Park", the Areti's laboratory for Electromobility, to test specific Smart Charge and V2G technologies</p>	<p>Concept</p>
<p>(Enel Grids #2 - Italy) DSO's grid flexibility project in Colombia</p>	<p>This pilot project aims to implement a flexibility scheme to ease grid congestions reduction guaranteeing the reliability of the service in the Sabana Norte region (within Enel concession area of Bogotá). The area is experiencing congestion events due to an increase of electricity demand and a potentially growth in the coming years.</p>	<p><5 M€ - public funded</p>	<p>The project foresees innovative and digital solution for near-real time dispatching and interactions between customers and DSO, benefitting more than 320000 customers. This pilot coordinates the availability of demand response flexibility services with the distribution system operator's smart grids, which enable the energy transition and the use of distributed energy resources, with a view to digitalize the network and customers, decarbonizing the energy sector.</p>	<p>Deploying</p>
<p>(GSE #1 - Italy) Strengthening the Institutional and Technical Capacity of the Malawi Energy Regulatory Authority (MERA)</p>	<p>The project is divided in four intertwined components: • Component 1 - to review and strengthen MERA institutional set-up / governance and organizational / operational processes; • Component 2 - to strengthen MERA's technical capacity; • Component 3 – to strengthen the economic regulation and market analysis; • Component 4 – to strengthen the legal capacity,</p>	<p>2.5 M€ - EU funding</p>	<p>1. support the modernization and industrialization of the Malawian economy. 2. enhance the governance of the Malawi energy sector by strengthening the Institutional and Technical Capacity of the Malawi Energy Regulatory Authority (MERA).</p>	<p>Deploying</p>

	administration, consumer support and digitalization processes of MERA.			
(Italy #1) RdS - Power system evolution, planning, management, and operation	The main fields of this project are: new system architecture, DC and AC transmission and distribution grid, observability, protection, control, monitoring, power quality, innovative technologies and superconductivity grid applications, planning (tool and methodologies development), adequacy, security, resilience, standardization activity and institutions support at national and international level.	18.6 M€ - public	1. pursuit of an efficient management of the Italian electricity system in order to satisfy, in perspective scenarios, operational security and quality criteria, adequacy and resilience	Deploying
UK #1 – Flexibility Innovation Programme	To support the transition to a smart, flexible and decarbonised energy system, the Flexibility Innovation Programme seeks to enable large-scale widespread electricity system flexibility through smart, flexible, secure, and accessible technologies and markets.	£65 m - public	Innovation in a range of smart energy applications across the themes of integrating systems for flexibility, data and digitalisation and markets for flexibility, which cover a total of 11 GPFM innovation priorities across Pillars 2 and 3.	Deploying
UK #2 – Longer Duration Energy Storage (LODES)	This program aims to accelerate commercialisation of innovative longer duration energy storage projects (excluding commercial solutions such as pumped hydro / lithium ion) at different technology readiness levels, through first-of-a-kind (FOAK) full-system prototypes or actual demonstrations.	£69 m - public	Longer duration storage could help reduce the cost of meeting net zero by storing excess low carbon generation for longer periods of time, helping to manage variation in generation such as extended periods of low wind. This could reduce the amount of fossil fuel and low carbon generation that would otherwise be needed and optimize the output from renewables.	Deploying