HANAMI

HPC ALLIANCE FOR APPLICATIONS AND SUPERCOMPUTING INNOVATION: THE EUROPE - JAPAN COLLABORATION

Funded by the European Union

EuroHPC Joint Undertaking

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DELIVERABLE 2.3

Collaboration Plan

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Lead Authors	Sophia Honisch (USTUTT)
Contributors	-
Peer Reviewers	Laure Caruso, CEA Pihla Kauranen, CSC
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Glossary of Terms

Item	Description
ADAC	Accelerated Data Analytics and Computing Institute
CoE	Centre of Excellence
EDIH	European Digital Innovation Hub
HPC	High-Performance Computing
HPCI	High-Performance Computing Infrastructure
ISC	International Supercomputing Conference
KPI	Key Performance Indicator
M	Month
NCC	National Competence Centre
TPC	Trillion Parameters Consortium
ICAIN	International Computation and AI Network

Executive Summary

The HANAMI project, funded by the EuroHPC Joint Undertaking under the EU-Japan Digital Partnership, is designed to foster collaboration between the high-performance computing (HPC) communities of Europe and Japan. The project focuses on enhancing and optimising HPC applications in scientific fields such as environmental sciences, biomedicine, and materials science. By leveraging the unique strengths of both regions, HANAMI aims to elevate global competitiveness and innovation in computational science.

Deliverable 2.3, the Collaboration Plan, outlines the strategies, goals, and activities necessary to strengthen collaboration within the HANAMI consortium and with external stakeholders, particularly focusing on the EU HPC ecosystem and Japan's HPC institutions. With an emphasis on fostering synergies, the collaboration activities engage internal stakeholders, academic and industrial partners, and key initiatives such as CASTIEL 2. The document also sets up a framework for monitoring and evaluating the effectiveness of collaboration activities, using Key Performance Indicators (KPIs) to measure progress and adjust the approach as necessary. The deliverable's ultimate aim is to ensure HANAMI's impact and sustainability through meaningful, lasting partnerships across the EU and Japan.

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1. Introduction

The HANAMI project, an initiative funded by the EuroHPC Joint Undertaking under the EU-Japan Digital Partnership, seeks to advance collaboration between European and Japanese high-performance computing (HPC) communities. This collaboration focuses on developing and optimising HPC applications across various scientific domains, including environmental sciences, biomedicine, and materials science. By leveraging the strengths and resources of both regions, HANAMI aims to enhance the global competitiveness of HPC applications and foster innovation in computational science.

Deliverable 2.3, the Collaboration Plan, is a strategic document outlining the approaches, goals, and activities necessary to strengthen collaboration within the HANAMI consortium and with external partners. This document excludes activities related to policymakers and funders, as these are comprehensively covered under WP7 (D7.1). Instead, the focus here will be on academic, industrial, and other relevant stakeholders, with a special emphasis on the CASTIEL 2 project and the broader EU HPC network.

The Collaboration Plan (D2.3) is structured into several sections to comprehensively cover the different aspects of collaboration within the project. Following the introduction, section 2.1 details HANAMI's objectives and the specific goals of Task 2.3 within WP2. Section 2.2 is dedicated to stakeholder mapping, where key internal and external stakeholders are identified and analysed. This section differentiates stakeholders based on their relevance to HANAMI's goals, explicitly excluding policymakers and funders, who are addressed under WP7.

Subsequently, in section 3.1, the deliverable presents the collaboration strategy, which details the approaches and key messages for fostering collaboration between European and Japanese HPC communities. This includes strategies for engaging with CASTIEL 2 and other EU-funded projects, as well as methods for expanding and leveraging the consortium's networks. Chapter 3.2 provides an overview of the planned and undertaken collaborative activities, including workshops, conferences,

and participation in external events. This section also covers the dissemination of project results and the engagement with external stakeholders. To ensure the effectiveness of these collaboration activities, the deliverable includes chapter 3.3 on monitoring and evaluation. This section outlines the framework for assessing the success of collaboration efforts, detailing the Key Performance Indicators (KPIs) related to WP2 and Task 2.3, and explaining the mechanisms for adjusting the collaboration strategy based on feedback and outcomes.

Finally, the deliverable concludes with a summary of the key points and a discussion of the next steps (section 4) until the final report in M36.

2. Analysis

2.1 Objectives

Kicked off in M4, Task 2.3 within WP2 is designed to support HANAMI's overarching goal of fostering collaboration and knowledge exchange between European and Japanese HPC communities. Specifically, this task coordinates the project's collaboration strategy with external stakeholders, focusing on engaging key partners within the priority scientific domains of environmental sciences, biomedicine, and materials science. Through structured engagement with external stakeholders, Task 2.3 enhances HANAMI's reach and impact within the broader HPC ecosystem. This task aims to leverage the collective expertise within the HANAMI consortium to promote best practices in HPC application development and optimisation. By facilitating the sharing of knowledge, experiences, and resources between Europe and Japan, Task 2.3 seeks to strengthen the ties within the HPC ecosystems of both regions.

A significant part of this task is to expand the consortium's networks, mapping the extended connections of its members to identify new opportunities for collaboration and build relationships with relevant actors in the HPC landscape. A crucial element of this effort is the engagement with the CASTIEL 2 Coordination and Support Action (CSA), establishing and maintaining a close relationship with the National Competence Centres (NCCs) of EuroCC 2 and the European HPC Centres of Excellence (CoEs). In addition to this, the task includes organising and executing various collaborative activities such as workshops, conferences, and digital events to foster interaction between stakeholders, thereby increasing the visibility of HANAMI and promoting its objectives. Finally, Task 2.3 also focuses on ensuring that the outcomes of the HANAMI project are widely disseminated within the HPC community, supporting the project's impact and sustainable, mutually beneficial collaboration.

2.2 Stakeholder Mapping

Before defining the collaboration strategy and activities for HANAMI, the stakeholders firstly have to be analysed – both from the internal and the external perspective. An overview of key stakeholder groups is provided in the following Table 1. The numbers behind the category name will be reflected in the stakeholder map, see Figure 1 following the stakeholder list.

Stakeholder	Category	Description & importance for HANAMI
HANAMI Consortium Members (EU, i.e. Grant Agreement members - funded)	Internal Stakeholders, 1	CEA coordinates the project, the other partners all have their specific roles as outlined in the Grant Agreement, some more focused on organisational parts and others with specific tasks in the scientific areas. These stakeholders are crucial for

		the project, as they are responsible for the success of the scientific results and a close collaboration with the Japanese partners.
HANAMI third parties (i.e. Japanese colleagues and industrial - non funded)	Internal Stakeholders, 1	RIKEN R-CCS provides access to the Fugaku supercomputer, the other partners, namely University of Hyogo, Tokyo Institute of Technology (TITECH), National Institute for Materials Science, Yokohama University, University of Tsukuba, University of Tokyo, Research Center for Advanced Science and Technology (RCAST), National Institute for Environmental Studies, Kyushu University, and Japan Agency for Marine-Earth Science and Technology (JAMSTEC) are each focused on one of the core scientific domains that HANAMI deals with. These stakeholders are highly relevant for HANAMI, as they have the power to help achieve a successful outcome in close collaboration with the European consortium partners.
CASTIEL 2	European HPC Ecosystem, 2	The coordination and support action of EuroCC 2 and the European HPC Centres of Excellence. CASTIEL 2 is a strategic partner for HANAMI, facilitating interactions within the EU HPC ecosystem and more than 40 further funded projects in that field.
Further EU-funded and national/regional	European HPC Ecosystem, 2	HPC-focused projects that could benefit from HANAMI's results or contribute to its

HPC EuroHPC Hosting Entities		outcomes (e.g. EUPex, EUPILOT, EUMaster4HPC, DestinE, ETP4HPC).
HPCI, Japan	Japanese HPC Ecosystem, 3	A network of supercomputing centers in Japan with a federated system for sharing HPC resources within Japan, with joint calls for resources etc. that could collaborate with HANAMI on various scientific applications.
European Universities and Research Institutes	Research Stakeholders, 4	Beyond the consortium members, other European academic institutions that are active in HPC research could be potential collaborators. This includes national research institutes, as well as non-HPC EU- and nationally funded projects alike. These projects focus on specific scientific domains and could benefit from or contribute to HANAMI's objectives.
Japanese Universities and Research Institutes	Research Stakeholders, 4	Universities and research centers that specialise in computational science or the key scientific domains and could contribute to or benefit from HANAMI's efforts, e.g. Tohoku University, Hokkaido University, Osaka University, Kobe University, Kyoto University, Nagoya University, etc.
Scientific User Communities	Research Stakeholders, 4	Researchers in domains like climate modeling, genomics, and materials science who use HPC resources are crucial stakeholders. Their needs and feedback will help shape HANAMI's activities and outputs.
Industry Partners and Users	Industry Stakeholders, 5	Companies in Europe and Japan that rely on HPC for research and development,

		particularly in biomedicine, materials science, and environmental sciences, could be key stakeholders in HANAMI's collaborative activities.
The European Interest Group (EIG) CONCERT-Japan, ADAC, TPC, ICAIN	Industrial and Research Collaboration Network, 6	Networks such as the European Interest Group (EIG) CONCERT-Japan are international joint initiatives, which support research and development collaborations between EU and Japan. These could connect HANAMI to other relevant stakeholders and serve as multiplicators.
EU-Japan Centre for Industrial Cooperation	Industrial and Research Collaboration Network, 6	The EU-Japan Centre for Industrial Cooperation is a joint initiative that promotes collaboration between European and Japanese industries, focusing on research, innovation, and technology transfer. For HANAMI, this center is a key partner in fostering industrial engagement, facilitating cross-regional collaboration in HPC applications, and enabling technology transfer between the two regions. It supports HANAMI's goals by connecting industrial stakeholders and promoting joint innovation efforts in fields like materials science and biomedicine.

Table 1: HANAMI Stakeholder List

Stakeholder mapping is a critical step in understanding the landscape in which HANAMI operates and identifying the key actors involved. This mapping focuses on the (HPC) ecosystem in both Europe and Japan, excluding policymakers and

funders, as outlined in D7.1. Further stakeholders will be monitored, assessed and added during the course of this project according to HANAMI's needs.

In order to prioritise stakeholders of highest relevance, all identified collaboration stakeholder categories have been assessed in a Stakeholder Engagement Matrix (Figure 1). The respective numbers are indicated in each stakeholder category in Table 1. These numbers are reflected in the Matrix below. This Matrix will serve as an orientation for the impact on HANAMI and thus the relevance for activities towards these stakeholders.

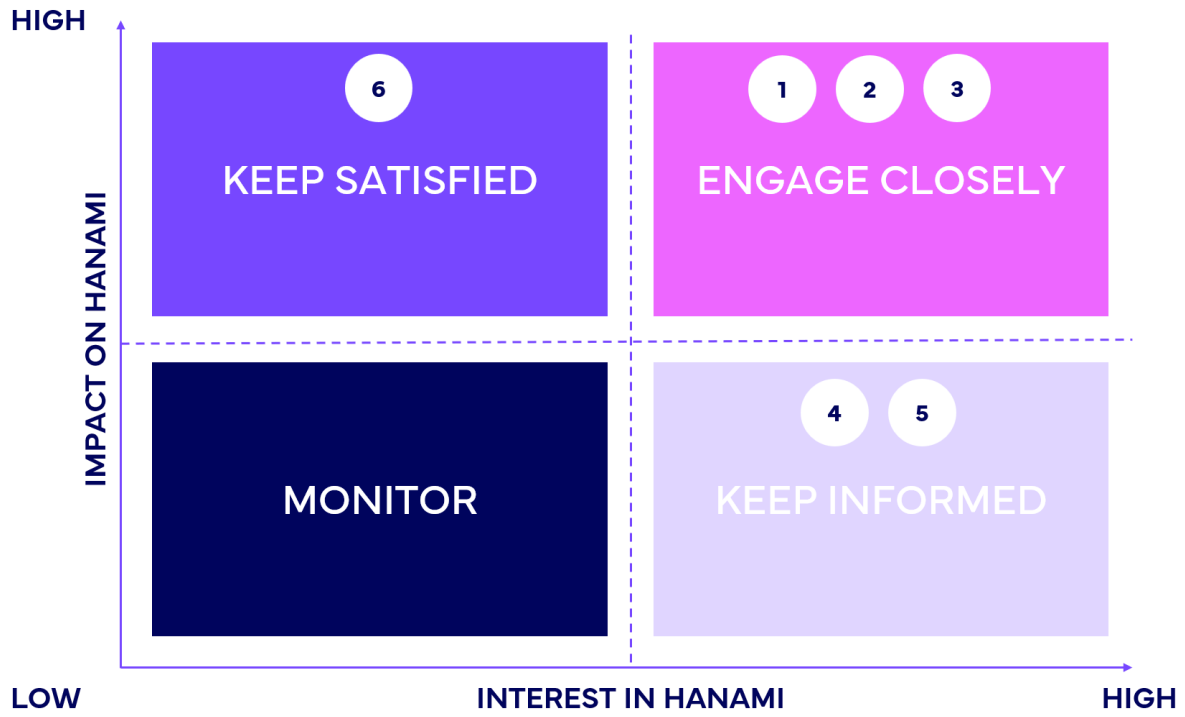

Figure 1: HANAMI Stakeholder Engagement Matrix

According to this assessment, most activities planned will be with the Internal Stakholders (1), as well as the European (2) and Japanese (3) HPC Ecosystems, while the Industrial and Research Collaboration Networks (6) can be useful multiplicators, and general Research (4) and Industry (5) Stakeholders should be kept informed about the ongoing activities of HANAMI. More details on specific activities will be provided in section 3.2 Activities.

3. Strategy

3.1 Approaches and Key Messages

In order to achieve HANAMI's goals and foster strong EU-Japan collaboration within the HPC domain, it is essential to engage each stakeholder group with tailored approaches and clear key messages, knowing their needs towards HANAMI. Below is a strategic outline that provides both the overarching approach to engagement for each group and the respective key message.

1. Internal Stakeholders (EU & Japan Consortium Members)

Approach: Internal stakeholders form the backbone of the HANAMI project, driving the scientific and technical work. Collaboration within this group must be highly structured, with regular touchpoints to ensure cohesion, clarity, and shared progress. The consortium members need to stay aligned across regions, sharing insights, resources, and expertise for successful project outcomes.

Their Needs: Consortium members are integral to the project's success, relying on close collaboration to achieve scientific objectives, optimise HPC applications, and generate impactful results.

Key Message: Collaborative excellence through shared expertise and resources

2. European HPC Ecosystem (CASTIEL 2, Other EU-Funded HPC Projects)

Approach: Engagement with the broader European HPC ecosystem is crucial for HANAMI to build on existing HPC knowledge and foster collaborations that enhance the project's impact. Through coordination with CASTIEL 2 and other EU-

funded initiatives (e.g. ETP4HPC), HANAMI can position itself as a key partner in the European HPC landscape and further amplify its results. This will be done by regular exchange, joint organised events and sharing of best practices.

Their Needs: By engaging with HANAMI, European HPC projects and organisations gain opportunities to share expertise, enhance their own capabilities, and apply the project's HPC advances in scientific domains like climate and environmental modelling, materials science, and biomedicine.

Key Message: Building strong synergies for HPC innovation in Europe for interaction with Japan

3. Japanese HPC Ecosystem (HPCI, Research Institutions)

Approach: The Japanese HPC ecosystem, particularly through HPCI and key research institutions, offers HANAMI access to cutting-edge technologies and research capabilities. Building close partnerships with these stakeholders is critical for facilitating a strong EU-Japan collaboration in high-performance computing, particularly in the fields of climate modeling, biomedicine, and materials science.

Their Needs: Engaging with HANAMI allows Japanese HPC institutions to participate in leading-edge research collaborations and gain access to European expertise, broadening their scientific reach and fostering transcontinental innovations in HPC.

Key Message: Strengthening transcontinental collaboration for HPC advancements

4. Research Stakeholders (Universities, Institutes, funded non-HPC projects, User Communities)

Approach: Engaging the broader research community beyond the consortium allows HANAMI to build a wider network of academic and scientific users who can benefit from its HPC advances. Active involvement of these stakeholders will provide valuable feedback on project outcomes and help shape future HPC applications.

Their Needs: For research stakeholders, engaging with HANAMI offers access to high-performance computing solutions that can significantly advance their work in key scientific domains, providing resources and collaborative opportunities they may not otherwise have.

Key Message: Driving forward computational research through cross-continental collaboration

5. Industry Stakeholders (European & Japanese Companies)

Approach: Engaging industry stakeholders is key for ensuring that the HPC applications developed under HANAMI are both relevant and applicable to real-world challenges. Industry partners from fields such as biomedicine, materials science, and environmental modeling will provide practical perspectives that can shape and validate the project's outputs.

Their Needs: Industry stakeholders stand to gain access to cutting-edge HPC solutions that can address pressing challenges in their fields, such as more efficient material simulations, improved environmental models, and advancements in biomedicine.

Key Message: HPC-driven solutions for industry challenges in biomedicine, materials science, and beyond

6. Industrial and Research Collaboration Networks (EIG CONCERT-Japan, EU-Japan Centre for Industrial Cooperation)

Approach: Collaboration with industrial and research networks such as EIG CONCERT-Japan and the EU-Japan Centre for Industrial Cooperation will help broaden HANAMI's reach, providing additional opportunities for engagement with cross-regional stakeholders. These networks will act as multiplicators, connecting HANAMI with industries and research initiatives in both regions.

Their Needs: Through HANAMI, these networks gain a valuable bridge between EU and Japanese HPC initiatives, facilitating cross-regional knowledge transfer and fostering innovations that benefit both research and industry.

Key Message: Connecting the innovation power of Europe and Japan

3.2 Activities

Initial collaboration activities were already undertaken with a preliminary plan based on the request for information on regularly visited events by project partners. In the following Table 2 you can find an overview of these measures, along with the a short description, an explanation of which stakeholders were targeted with these, and a reference link for further information.

Activity	Timing	Description	Target Stakeholder Category	Reference Link
EuroHPC Summit 2024	March 2024	HANAMI's first international appearance at the EuroHPC Summit in	European HPC Ecosystem	EuroHPC Summit

		Antwerp. A project poster was presented, promoting objectives and research areas.		
Kick-off Meeting	April 2024	HANAMI Project started with a meeting in Paris, uniting Europe and Japan partners. Objectives and procedures for the project's execution were set.	Internal Stakeholders	HANAMI Kick-off
ISC24	May 2024	HANAMI was presented at ISC24 in Hamburg, with an interactive session at the EuroHPC booth. The event facilitated engagement with the HPC community.	European HPC Ecosystem	ISC24
TERATEC Forum 2024	May 2024	HANAMI featured at the 19th Teratec Forum, presented at the CEA booth. This event brings together international experts in HPC, AI, and quantum computing.	Industry Stakeholders	TERATEC Forum
WSSP Spring 2024	June 2024	HANAMI was presented at the Workshop on Sustained Simulation Performance (WSSP), co-organised by HLRS and	Japanese HPC Ecosystem, Research Stakeholders	WSSP Workshop

		Tohoku University, focusing on HPC simulation performance.		
International HPC Summer School 2024	July 2024	HANAMI flyers were distributed at the International HPC Summer School in Kobe to promote the EU-Japan collaboration in HPC among participants.	Research Stakeholders	HPC Summer School
SC24 (BoF Session)	November 2024	HANAMI hosted a Birds of a Feather (BoF) session at SC24 with panel discussions and audience interaction, focused on fostering international collaborations in HPC.	All	SC24 BoF Session
General Regular Sharing of Calls	Ongoing, quarterly	The HANAMI team consistently shared relevant project calls with partners to ensure active collaboration and participation.	Internal Stakeholders	N/A
Requests for Information on Ongoing Events	Ongoing, frequently	The HANAMI team regularly requested updates on relevant EU-Japan HPC-related events to ensure project participation, particularly during the initial phases.	Internal Stakeholders	N/A

Table 2: Collaboration Activities M1-M9

According to the approaches outlined in section 3.1 Approaches and Key Messages, a continued plan for activities has been developed with a timeline. For a birds-eye view, this overview is available in the Gantt chart below (see Figure 2). The details on each activity can be found thereafter.

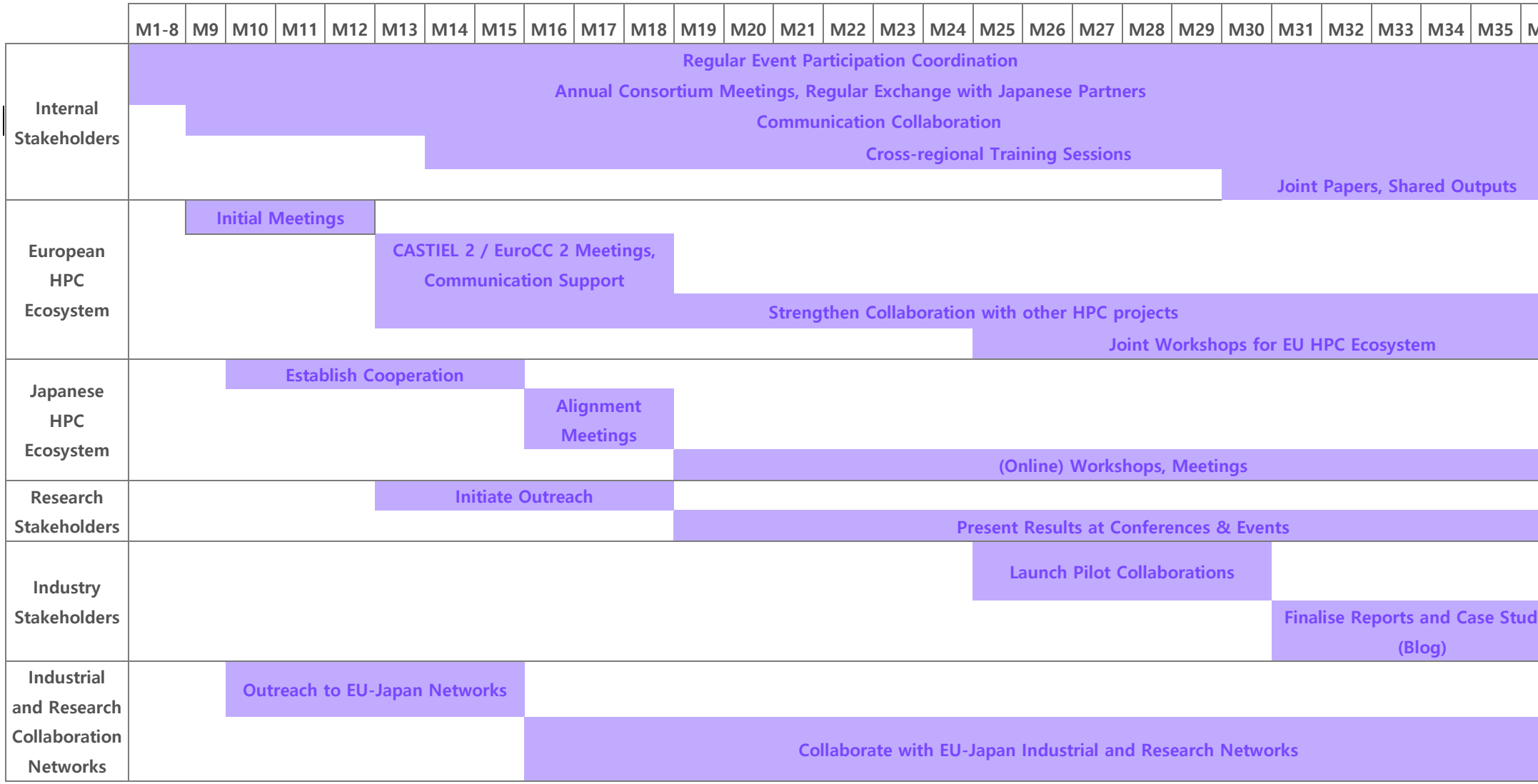

Figure 2: HANAMI Collaboration Activity Plan

More details related to the activities shown in the Gantt chart will be outlined in the following paragraphs.

Internal stakeholders Activity Plan:

- **M1-M36**: Regular coordination of HANAMI collaboration at HPC-related events partners participate in**M1-M36**: Annual consortium meetings to review scientific progress, share lessons learned, and adjust project workflows as needed
- **M1-M36**: Participation of Japanese partners in regular HANAMI consortium meetings
- **M9-M36**: Communication collaboration: Social media posts promoting HANAMI on the social networks of the Japanese institution, blog posts written by Japanese partners, social media campaigns targeting Japan, Japanese media outreach (e.g. HPC Wire Japan)
- **M14-M36**: Organise cross-regional training sessions on HPC best practices, targeting both European and Japanese partners for knowledge exchange
- **M30-M36 (and beyond)**: Focus on joint scientific papers and shared outputs for dissemination to the broader HPC community

European HPC Ecosystem Activity Plan:

- **M9-M12**: Initial meetings with CASTIEL 2 to align HANAMI's objectives with the larger EuroCC 2 and European HPC goals. Identify synergies for collaboration. Ensure a strong presence at core community events, e.g. ISC High-Performance, EuroHPC Summit, etc.
- **M13-M18**: Participate in CASTIEL 2 and EuroCC 2 events to present HANAMI's progress and facilitate knowledge exchange between the projects. Get communication support, e.g. by sharing information about HANAMI via the EuroCC and HPC CoE communication channels
- **M13-M36**: Strengthen collaborations with other EU-funded projects by organising joint events or contributing to shared scientific goals
- **M19-M26**: Offer joint workshops to the EU HPC Ecosystem (promotion also via CASTIEL 2 and the larger network) to promote the integration and

adoption of HPC applications in European industry sectors, specifically in materials science and environmental modeling

Japanese HPC Ecosystem Activity Plan:

- **M10-M15**: Establish formal cooperation with HPCI and select Japanese research institutions to introduce HANAMI and identify initial collaboration opportunities
- **M16-M18**: Host virtual meetings to align priorities and scientific goals between EU and Japanese partners
- **M19-M36**: Organise workshops and technical meetings (in Japan) to advance collaboration on specific HPC applications

Research Stakeholders Activity Plan:

- **M13-M18**: Initiate outreach to European and Japanese universities through academic conferences and webinars, showcasing HANAMI's progress and potential research applications
- **M19-M36**: Present results at international conferences and events, targeting user communities in relevant scientific domains (e.g., climate modeling, genomics)

Industry Stakeholders Activity Plan:

- **M19-M24**: Participate in industry forums and conferences to introduce HANAMI's potential to solve industry-specific challenges
- **M25-M30**: Launch pilot collaborations with selected industry partners to apply HPC solutions to industry problems (e.g., material simulations or environmental forecasting)
- **M31-M36**: Finalise reports and case studies (blog posts) based on these industry collaborations to demonstrate the effectiveness of HPC solutions developed under HANAMI

Industrial and Research Collaboration Networks Activity Plan:

- **M10-M15**: Reach out to the EU-Japan Centre for Industrial Cooperation and other networks for an initial presentation of HANAMI and discuss opportunities to collaborate, particularly focused on technology transfer and industrial collaboration in HPC applications
- **M16-M36**: Collaborate with EIG CONCERT-Japan and other networks on hosting joint EU-Japan events, focusing on innovation and research synergies, particularly in biomedicine and materials science

3.3 Monitoring and Evaluation

This part of the deliverable focuses on monitoring and assessing the success of collaboration efforts defined and planned for the entire project runtime. Key

Performance Indicators (KPIs) will help to establish measurable target values and evaluate the work performed regularly. The KPIs table will be checked and updated monthly. According to the status identified, respectively, the collaboration strategy might be adapted from time to time.

Measurement Item	**Target Value by M36**	**Status M9**
Joint scientific papers between EU/Japanese partners	min. 5	1
Cross-regional HPC training sessions	min. 3	0
Blog articles by Japanese partners	min. 6	0
Media coverage by Japanese media	min. 2	0
Social media (organic) campaigns targeting Japan	min. 3	0
Alignment meetings with CASTIEL 2	min. 2	0
Online workshops with CASTIEL 2/EU HPC organisations	min. 3	0
Joint events or projects with other EU-funded initiatives	min. 6	2
Cross-regional events participation	min. 5	1
Presentations at international conferences	min. 6	0
Online workshops with Industrial and Research Collaboration Networks/offered to industry	min. 2	0
Meetings/formal exchange with industry stakeholders	min. 2-3	1

Figure 3: HANAMI Collaboration KPIs

A collaboration tracker in the form of a table, including a short activity description, date, responsible partner and person, collaboration partner and measurable results, to keep track of the progress and report the activities regularly will be established by WP2 and in exchange with all project partners. Regular surveys as well as

updates with project partners will ensure that all ongoing measures can be monitored.

4. Conclusions

The HANAMI project has initiated efforts to promote collaboration between the European and Japanese HPC communities since its launch, laying a strong foundation for significant impact by the end of the project.Through targeted efforts, the project will foster knowledge sharing and establish key partnerships, notably with European and Japanese HPC Ecosystems, Research Stakeholders from both regions, Industry Stakeholders, as well as Industrial and Research Collaboration Networks. Internal and external stakeholder engagement activities have been structured to build a sustainable collaboration framework, enabling the alignment of HPC efforts across scientific domains such as climate modeling, biomedicine, and materials science, but also between the two HPC ecosystems and the wider scientific audience.

Deliverable 2.3 provides a clear and actionable collaboration strategy for the next steps of the project work, with an emphasis on leveraging cross-regional synergies, expanding networks, and promoting joint research. The activities planned through M36, including workshops, conference presentations, and joint publications, will ensure that the project's outcomes are impactful and relevant to both European and Japanese stakeholders. Regular monitoring through KPIs will help track progress and ensure the collaboration remains focused and productive throughout the project’s lifecycle.