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Centre of Excellence in Exascale CFD

CEEC – Centre of Excellence in Exascale CFD

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D6.2 – Communication and Dissemination Plan

WP6: Communication, Dissemination, and Exploitation

EuroHPC Joint Undertaking

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List of Abbreviations

CFD	Computational Fluid Dynamics
CoE	Centre of Excellence
GDPR	General Data Protection Regulation
HLRS	High-Performance Computing Center Stuttgart
HPC	High-Performance Computing
ISV	Independent Software Vender
KPI	Key Performance Indicator
NCC	National Competence Center
OA	Open access
PM	Project Month
SEO	Search Engine Optimization
SMEs	Small and medium enterprises

Executive Summary

This document is the second deliverable of work package 6: “Communication, dissemination, and exploitation” of the Centre of Excellence for Exascale CFD (CEEC), co-funded by the EU. This work package is concerned with the effective communication of the exploitable results of the project, management of intellectual property, and support establishing CEEC as a principal contact for cutting-edge computational fluid dynamics (CFD) on Exascale High-Performance Computing (HPC) systems.

In this deliverable 6.2, first the objectives of Work Package 6 are analysed with regards to CEEC's target audiences and tailored messages. Second, the document describes which channels and communication tools will be used in order to achieve the goals related to these target groups. Finally, the monitoring and measurement of progress and success factors will be outlined in this deliverable. This deliverable will not outline the collaboration plan, which is instead covered in D7.3.

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1 Introduction

The Centre of Excellence for Exascale CFD (CEEC) aims to boost computational fluid dynamics (CFD) to the exascale with simulations capable of helping to solve grand challenges previously too computationally expensive. To fulfil this goal, CEEC must establish itself as an authority on exascale CFD simulations among the correct stakeholders. This deliverable will outline and discuss the strategy, activities, and metrics necessary to build awareness in stakeholder target groups who can, in turn, maximise the impact of CEEC work on addressing these grand challenges.

In the first section of this document, the dissemination and communication strategy addresses the question of how information is exchanged within the project, what communication goals CEEC aims to reach, who the target groups are, and what message the project wants to deliver to each of them. In addition, communication and dissemination performance evaluation is outlined with the help of KPIs. The second section of this document explains the specific communication measures and tools the project uses in order to meet the strategy outlined in the prior section.

Additionally, this deliverable briefly describes some of the activities that can be performed in cooperation with partners beyond CEEC. Efficient collaboration on various levels is mentioned, e.g., with other European Centres of Excellence (CoEs), National Competence Centres (NCCs), or national projects/partners working on HPC-related fields. However, the full collaboration plan is described in D7.3 from work package 7.

2 Dissemination and Communication Strategy

2.1 In-Project Collaboration and Information Flow

The success of the CEEC work package 6 on Communication, Dissemination, and Exploitation highly depends on the regular input and updates of other work packages and project partners. Therefore, two sets of measures have been established to facilitate exchange and partner participation. These consist of meetings and logging. WP6 is involved in the following meetings:

Meeting Title	Members and Goals
WP6 Bi-Weekly Meeting	One member for each project partner participates in the bi-weekly WP6 meeting. The meeting is comprised of task updates on communication, dissemination, and exploitation. Additionally, each partner provides a brief overview of their institution's activities within the project.

Technical Board Bi-Weekly Meeting	CEEC work package leaders and deputies from all 7 work packages participate in the technical board meetings whose goal is to provide regular updates on the overall status of the project as well as to detect blockers on an overriding, process and management related level. It is also the forum for larger cross-work package discussion and collaboration.

Table 1: Meetings with WP6 Participation

Between meetings, WP6 members also collaborate on tasks within the project shared document space such as compiling content for the CEEC website or updating lists of future events.

Furthermore, this work package has created an excel document for tracking WP6 KPIs, which are updated and periodically reviewed with the entire project during both the technical board and WP6 bi-weekly meetings. The document keeps track of the following events:

- Publications
- Twitter Statistics & LinkedIn Statistics
- Web Analytics
- Media Relations
- Events (Including internal workshops)

These individual items will be discussed in greater detail in chapter 3.

2.2 Dissemination and Communication Goals

With the help of high quality and to-the-point-content for the targeted interest groups, a strong presence at conferences, hosting community events, publications in scientific journals, and press relations, CEEC pursues the overall goal of raising visibility of the project. This overriding goal can be split up into five more specific goals:

- Raise awareness of the benefits of using exascale CFD simulations
- Raise awareness of CEEC achievements and their potential for impact on grand challenges
- Help increase attendance to presentations, workshops, and demonstrations held by CEEC at scientific or industrial events
- Help increase attendance at workshop and training events organized by CEEC
- Transfer CEEC knowledge to users in order to facilitate impact

These goals will be supported through regular communication and dissemination activities as described below.

Additionally, the goals of community building during the CEEC project consist of linking CEEC to pre-existing communities and establishing CEEC as an authority on exascale CFD simulations. To that end, activities will focus on identifying individuals within the project partners who can act as expert project ambassadors to communities such as:

- Independent software vendors (ISVs) offering software and service in domains that routinely use or could benefit from exascale CFD simulations
- Software developers (in academia and industry), who contribute to the development of the CEEC codes (or similar applications)
- Users (from academia and industry), who are interested in making sure that future applications' developments take their requirements into account
- Trade unions, who may act as an interface between the application developers and the end users, e.g. NAFEMS

Within the upcoming weeks, we will identify all actors in CEEC who share interest in a specific code or community and connect them to the already existing codes and communities. In addition, the CEEC communication plans will be developed individually for each of the code or user -specific sub-groups in order to blend best into the pre-existing communities.

2.3 Target Groups

A well-defined audience is key to finding the best dissemination strategies to follow and messages to send. The work conducted by CEEC affects mainly three target groups within the scientific and commercial arena. In Table 2, these target groups including tailored messages are listed.

Target Groups	**Message**
Technology-interested broader public, people interested in the overall goals and progress of the project, political stakeholders	Advances in CFD simulations will contribute to meeting a variety of grand challenges impacting sustainability, flight safety, manufacturing, urban modeling, and many others. CEEC will push the state of the art of CFD forward to meet these grand challenges.
Scientific community, industrial research	The advancement of the state of the art in CFD simulation for improved scalability and efficiency at exascale will progress knowledge and thus benefit the

	wider CFD research community. The improvements made by CEEC will allow industry to use better simulation models that will contribute to their market competitiveness.
ISVs, industrial users, academic software developers	Real-life use cases will allow a quick take-up of the algorithms and methods developed in CEEC codes contributing to European CFD application excellence. The subsequent increased use of large-scale CFD simulations will stimulate the HPC market.

Table 2: CEEC Target Groups

2.4 Performance Evaluation

To monitor the progress of CEEC work package 6 activities, a number of key performance indicators (KPIs) have been identified for the overall project (Table 3). Within both the WP6 bi-weekly and technical board meetings, this progress will be updated, monitored, and discussed. It will also be included in all relevant project reports and regularly updated over the consortium "CEEC-all" email list.

Communication Measure	**Target Groups**	**Key Performance Indicators (KPIs) and Targets**
Website, promotional material (flier, banners)	Technology-interested broader public, people interested in the overall goals and progress of the project, political stakeholders	2,000 monthly unique website visitors (average) = total of 96,000 unique website visitors
Social media	Technology-interested broader public, people interested in the overall goals and progress of the project, political and academic stakeholders (Twitter), business-oriented target audience (LinkedIn)	Twitter: >600 followers; on average >=8 tweets per month, i.e. >384 tweets in total; 1.5% average engagement rate LinkedIn: >400 followers; on average >=4 updates per month, i.e. a total of 192 updates; 3.0% average engagement rate

Scientific publications	Scientific community, industrial research	20 scientific publications accepted (including conference proceedings)
Conference presentations and major presence (e.g. organization of workshops, tutorials, booths, minisymposia)	All, depending on the event and topic of the contribution	40 conference presentations 8 (co-)organized events with major presence of CEEC
Webinars	ISVs, industrial users, academic software developers	4 per year, i.e. 16 in total, >=20 participants on average
Community workshops	All	1 per year, i.e. 4 in total
Internal workshops (internal dissemination of approaches (e.g. topology, ML, wall models,...))	Internal stakeholders	2 per year, >66% of the partners involved

Table 3: Communications and Dissemination Key Performance Indicators

3 Dissemination and Communication Measures and Tools

3.1 Events

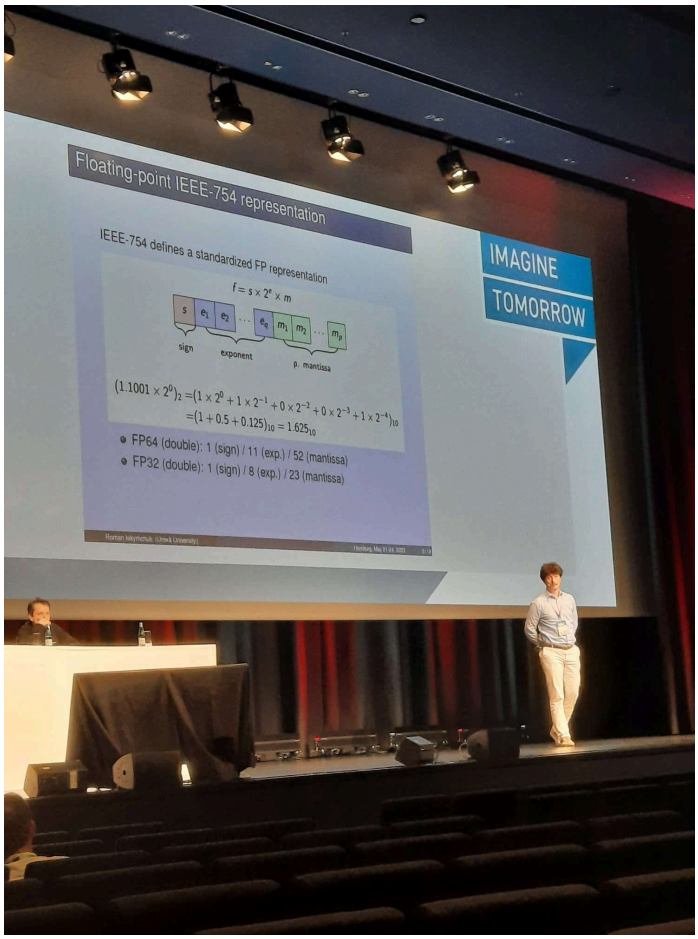

Figure 1: ISC High-Performance 2023 Focus Group

CEEC has identified a large set and variety of events with CFD, mathematical, and HPC backgrounds to visit for the purpose of networking, awareness creation, and knowledge transfer. Some of these events have already taken place within the starting months of the project with dissemination on the CEEC events calendar [1] and social media channels, as appropriate.

Title	Location	Date	Category
Scalable High-Fidelity Simulation of Turbulence with Neko Using Accelerators CUG 2023 "Sustainable Exascale"	Helsinki, Finland	11/05/2023	Conference Presentation
ISC High Performance 2023	Hamburg, Germany	21/05/2023 - 25/05/2023	Booth presence

Introducing CEEC at ISC High Performance 2023	Hamburg, Germany	24/05/2023	Booth presentation
Reliable and sustainable computations: An application-driven approach ISC High Performance 2023	Hamburg, Germany	24/05/2023	Conference Presentation
Neko: A Modern, Portable, and Scalable Framework for High-Fidelity Computational Fluid Dynamics Math 2 Product (M2P)	Taormina, Italy	1/6/2023	Conference Presentation

Table 4: Past Events with CEEC Presence

The table below provides a short list of potential events for future CEEC presence. Although the submission deadlines for this year may have passed, many of these events reoccur annually and will continue to be excellent opportunities for dissemination and knowledge transfer. All partners will also represent CEEC at relevant fluid-dynamics conferences to promote CEEC developments.

Title	**Frequency**
Workshop on Sustained Simulation Performance (WSSP)	Bi-annual
International Industrial Supercomputing Workshop – IISW	
Hyperion HPC User Forum	Annual
NAFEMS World Congress	Annual
ISC High-Performance	Annual
EuroHPC Summit Week	Annual
PASC23	Annual
ILAS2023	Annual
XR-Expo	Annual
ICIAM2023	Annual
SC2023	Annual
Helmholtz GPU Hackathon	Annual
Particles 2023	Every 2 Years
SIAM CSE	Annual
Gesinus Meeting	Annual

Table 5: Potential Future Events for CEEC Presence

In addition to the existing events related to HPC and CFD, CEEC will organise a number of its own events including minisymposia, workshops, and webinars throughout the project runtime. Four of these, the community workshops, are also project milestones listed in Table 7.

The self-organized events that take place outside of conferences are defined as follows:

- Webinars: are always online and open to stakeholders from ISVs, industrial user communities, and academic software developers. These provide the opportunity to transfer CEEC knowledge to users who can apply it to their own CFD work.
- Community Workshops: are in person and open to all stakeholders. The focus of these workshops will be defined according to project progress each year.
- Internal Workshops: preferably in person or hybrid and open only to consortium members of CEEC. These serve as an opportunity to consolidate progress and transfer knowledge among project work packages.

3.2 Publications and White Papers

Scientific publications in journals and conference proceedings help disseminate innovations and exploitable results. Therefore, project results, outcomes, and innovations will be submitted for publication in scientific journals and conferences relevant to the topic of running CFD simulations on HPC systems. The below is a selection of journals and proceedings that CEEC aims to target:

- *AIAA Journal*
- *Journal of Computer Physics Communications*
- *Journal of Computational Physics, Computers & Fluids*
- *Journal of Scientific Computing*
- *SIAM Journal of Scientific Computing*
- *ECCOMAS*
- *ERCOFTAC*
- *EUROMECH*
- *ICOSAHOM*
- *ICCFD*
- *ACM Transactions on Architecture and Code Optimisation*
- *ACM Transactions on Computing Systems*
- *ACM Transactions on Parallel Computing*
- *IEEE Transactions on Parallel and Distributed Systems*
- *IEEE Transactions on Computers*
- *Journal of Parallel and Distributed Computing*
- *Concurrency in Computation Practice and Experience*
- *Euro-PAR*
- *PLDI*

- *HPDC*
- *IPDPS*
- *eScience*
- *Supercomputing*
- *POPL*
- *CF*
- *ROSS*
- *CCGrid*
- *ICCS*
- *PPoPP*
- *CGO*
- *PACT*
- *OOPSLA*
- *ICS*
- *ICPP*
- *HiPEAC*
- *ISC*

CEEC also has a dissemination budget for open access publication (OA), which enables quality assurance of scientific publications and makes scientific achievements more easily accessible.

Given the numerous Industrial applications of CFD, CEEC will also publish white papers describing all Improvements to codes as well as best practices for exascale optimisation. To promote knowledge transfer to the broadest possible audience, these publications will not be exclusively aimed at academia but also seek to ensure that knowledge is efficiently transferred to the commercial arena.

3.3 Website

The CEEC website [2] architecture and analytics have already been addressed in detail in Deliverable D6.1: CEEC Brand and Website. The procedure for blogging will be explained in chapter 3.4 below. Future reports will address the results of website analysis more thoroughly.

3.4 News Updates (Blogging)

The “News” section of the website will act as a blog for the project. The planned frequency of posts is monthly. Especially at the start of the project, these articles will present key terms and concepts in CFD and highlight the importance of HPC in CFD to scientific advances, industrial innovation, and society.

In later stages of the project, the articles will be used to promote and explain publications, technical achievements, and potential impacts of the project. It is expected that each partner will also have a turn in providing high-quality content for the website

in synchrony with each work packages' technical milestones. However, since this work package aims for easy to read articles accessible to the general public, content will be revised to reduce highly technical language and overly long articles. To ensure both technical accuracy and high-quality writing, the expected review cycles will not allow for more than one article per week even towards the end of the project when higher frequency publications and milestones are anticipated. An overview of planned themes in the next few months is displayed below although deviations in the actual editorial plan may occur.

Publication	**Theme**
March 2023	Hello World and EU HPC Summit Week
July 2023	ISC recap and explainer
late MJuly 2023	What is CFD?
August 2023	How do CFD Simulations Work?
September 2023	What Makes CFD simulations not work?
October 2023	An overview of CEEC Codes and Potential Improvements as Explained by Lighthouse Cases

Table 6: Draft Editorial Plan

3.5 Multimedia Content

To enhance the attractiveness and accessibility of such a technical subject matter, CEEC will take a multi-media approach to communication. Some news articles may be enhanced by video content showcasing an individual in the project as an expert. Potential formats may include:

- Recordings of presentations (with prior permission)
- Interviews
- Explanatory videos
- Image videos

3.6 Print Material

By month 4 of the project, an initial print material in the form of a branded book mark with QR code was completed for distribution at early events such as ISC High Performance 2023.

Figure 2: CEEC Bookmark

By PM8 of CEEC the first version of a project brochure will be created in order to distribute at events starting in the fall. This flyer's objective is to introduce the project, lighthouse cases, and goals. Later on, a second version will be created to incorporate updated information concerning the project results and achievements. The first version of the flyer will be printed and distributed to partners for dissemination events on demand and will be made available in electronic format on the website. CEEC will also closely collaborate with CASTIEL2 and place regular project news and updates in their materials.

3.7 Social Media

CEEC uses social media not only to promote its own content but also as a tool for engaging with the wider HPC and CFD communities. Within CEEC social media Is used to:

- Increase traffic to the website
- Create a community interested in exascale CFD simulations and the codes that power them
- Inform the community about event participation or new publications
- explain the impact of CEEC activities
- promote CFD related activities in other Euro HPC projects like FF4EuroHPC [3]

In the following deliverablesD6.4 and D6.5, more detailed information will be given on user statistics and metrics of social media.

3.7.1 LinkedIn

On LinkedIn [4], #HPC, #CFD, and #exascale have been selected as communities to make the site's purpose easily understandable for visitors. Content will focus on event announcements with additional detail for trainings and workshops as compared to Twitter. Also, any publications or news stories of particular interest to industry and SMEs will be featured. Additionally, content from other projects and initiatives like EXCELLERAT or FF4EuroHPC that also work with CFD will be shared with explanations of how their work relates to CEEC or how CEEC results might have future impact on similar work and projects. In this way, industrial users who more frequently use LinkedIn will be presented with all opportunities to gain new skills as well as the context to appreciate CEEC work even in the absence of original material like industrial success stories.

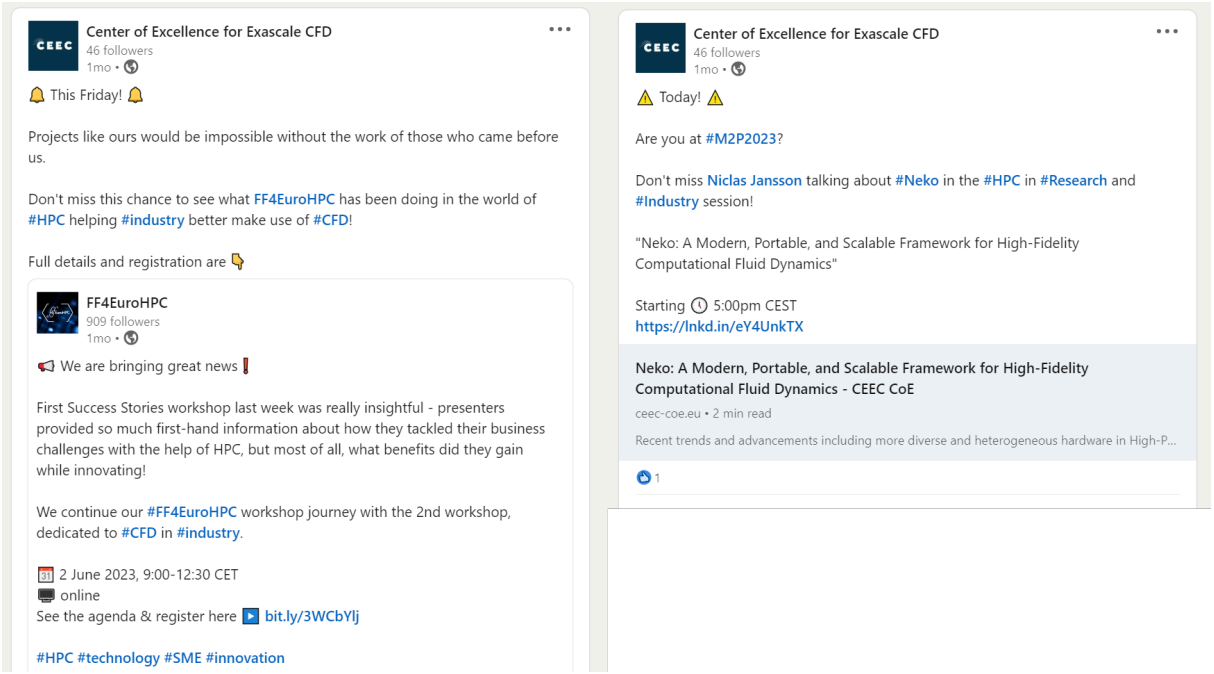

Figure 3: Example LinkedIn Posts Relevant to Industry

3.7.2 Twitter

On Twitter [5], CEEC uses #CFD and #hpc as individual thematic hashtags. In addition, when participating in events that often have branded hashtags or handles e.g.

@ISChpc, CEEC picks these up. Whenever possible, CEEC also tags relevant partner's handles such as @HLRS_HPC to posts in order to encourage engagement. A publicly visible list of the projects' stakeholders will serve as additional context.

In contrast to LinkedIn, Twitter content will primarily target the academic and general public audiences. Events of interest to students and other CFD researchers will be announced multiple times over the registration timeline and all publications will be immediately shared even before explainer news articles are available. Conversely, all explainer articles for publications, key CFD concepts, or project news will be shared with hashtags that might interest the general public such as holiday hashtags like #EarthDay or general topics like #GreenTransition combined with regional tags like #EU or #Europe. We will also look for mainstream public campaigns around green energy, sustainability, and science that can help contextualize CEEC work within societal challenges for a general audience.

In the case that Twitter becomes unsuitable for reaching our target audience, CEEC will explore alternate social media networks and communities such as the HPC Mastodon server [6].

3.8 Media Relations

Through HPC events, social media, and via the project website, this work package will maintain close contact with the HPC trade press. However, CEEC must also endeavour to reach a broader audience. A list of possible media outlets including some targeting a broader public audience, which might be further extended, are available below.

- HPCwire
- The Next Platform
- insideHPC
- Phys.org
- Science Daily
- ScienMag
- EU-magazine "Research"
- HiPEAC newsletter
- CFD Online

The success of CEEC media relations will be measured in pickups by the press, although we do not have a specific KPI. A list presenting press clippings will be updated regularly via the "CEEC-all" email list and included in future deliverables.

3.9 Newsletter

Although CEEC KPIs do not include a newsletter, this work package will set up an online newsletter, subscription page, and archive on the project website within the first year of the project. Publication Is anticipated approximately quarterly after that time depending on the frequency of events, workshops, publications, and milestones to

announce. Given the data collection limitations of GDPR, newsletter subscribers provide a valuable snapshot of CEEC stakeholder information in the form of email domains.

4 Collaboration Plan

A full collaboration plan is provided in work package 7 D7.3. However, the goal in brief is to maximise the impact of project funding by exploiting synergies with other projects. In particular, collaboration with other Centres of Excellence (CoEs), National Competence Centres (NCCS), and the CASTIEL2 project will broaden the reach of CEEC offerings and knowledge transfer especially with Industry and small and medium enterprises (SMEs) who are not directly involved in CEEC.

5 Next Steps

In conclusion, CEEC communication and dissemination will be tailored to three target groups as described in section 2.3 and measured by its progress towards the KPIs outlined in section2.4. The tools and measures described in chapter 3 will be deployed, tracked, and adjusted as needed over the course of the project using the meetings and ongoing feedback loops outlined in section 2.1 on internal communications. All of these activities will also be used to support collaborations between CEEC and other projects/programs as detailed in D7.2. Otherwise, this document will be updated during the course of the project to reflect updates and changes, which will naturally occur within the course of the project. Those updates will occur in D6.4 and D6.5 as shown below:

Number	**Title**	**Due**	**Status**
D6.1	CEEC brand and website	PM4	Submitted
D6.2	Communication and Dissemination Plan	PM6	Pending
D6.3	Exploitation plan	PM6	Pending
D6.4	Report on Communication and Dissemination	PM24	Pending
D6.5	Final Report on Communication and Dissemination	PM48	Pending
D6.6	Final Report on Exploitation and Innovation	PM48	Pending

Table 7: Work Package 6 Deliverables

The first milestone reached in CEEC with the support of work package 6 was the CEEC Brand and Website Available in PM4. This milestone was described in detail in D6.1 as well as further website updates described above in section 3.3. Upcoming milestones for WP6 are the Community Workshops that follow the schedule below:

Number	Title	Due	Status
M1	CEEC Brand and Website Available	PM4	Complete
M4	First Community Workshop Completed	PM12	Pending
M5	Second Community Workshop Completed	PM24	Pending
M6	Third Community workshop Completed	PM36	Pending
M19	Fourth and Last Community Workshop Completed	PM 48	Pending

Table 8: Work Package 6 Milestones

In the months to come, work package 6 will focus on the implementation of the communication plan drafted in this document and deepen relations with collaboration partners to achieve KPIS and, ultimately, maximize CEEC impact.

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[3] CEEC CoE [@CEEC_CoE], "📣 This Friday! 📣 Projects like ours build on the success of those who came before. Check out what @FF4EuroHPC has been doing to benefit #Industry using #HPC powered #CFD! Registration 👇," *Twitter*, May 30, 2023. https://twitter.com/CEEC_CoE/status/1663445890194079744 (accessed May 31, 2023).

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