

Grant Agreement No: 731086

AMICI

Accelerator and Magnet Infrastructure for Cooperation and Innovation
Horizon 2020 / Coordination and Support Action (CSA)

DELIVERABLE REPORT

DEFINITION OF THE PARTICIPATION OF INDUSTRY DELIVERABLE: 1.2

Document identifier:	AMICI-D1.2
Due date of deliverable:	End of Month 4 (April 2017)
Report release date:	4 June 2017
Work package:	WP1: Management, coordination and dissemination
Lead beneficiary:	INFN
Document status:	Final

Delivery Slip

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Approved by	Steering Committee		8 June 2017

Deliverable:

Definition of the participation of industry

Executive summary:

This report describes the work accomplished by Task WP1.2 in order to associate industrial companies in the work of AMICI for the remainder of the project duration until June 2019. First the concept of Technology Infrastructure and the AMICI work program are briefly recalled. Then, the methodology used to establish contact with the European industrial sector is described, leading to the convening of the 'AMICI Partners and Industry Days' where companies were introduced to the AMICI work program and partnership was registered, Task by Task, on a voluntary basis. The outcome of the survey questionnaire distributed to the individual participants is summarized. Finally, the organisation of the proposed partnerships including new actions arising from discussion with industry, is presented.

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1 INTRODUCTION TO THE AMICI PROJECT

The collaboration between European Technological Facilities and Industry has been seminal for the realization of unprecedented scientific endeavors, like the Large Hadron Collider at CERN (CH), the W7X reactor at the Max Planck Institute for Plasma Physics (DE), the EU-XFEL accelerator at DESY (DE), the SwissFEL at PSI (CH), the European Spallation Source at Lund (SE), the ANKA light source in Karlsruhe (DE) and ITER at Cadarache (F) (see Fig.1) that have recently projected Europe to an undisputed position of worldwide leadership in the fields of accelerators and superconducting (SC) magnet based science.



Figure 1: Large Research Infrastructures in Europe (W7X, ATLAS, SwissFel, ESS, EuXFEL, LHC, ITER, ANKA)

The construction of such projects is only possible through the realization of a large and distributed accelerator and SC magnet **Technology Infrastructure (TI)** including high technology systems built to unparalleled quality standards and representing a major investment and asset for Europe (see Fig.2). It includes several technological facilities (see Fig.3), located at research laboratories and industrial sites, and entails:

- sophisticated R&D platforms for key technologies,
- large-scale facilities for assembly, integration and verification,
- large concentrations of dedicated, highly-skilled personnel,
- long-standing relationships between laboratories and industry.



Figure 2: Technical Platforms at CEA, CERN, CNRS, DESY, INFN, IFJ-PAN, STFC, PSI, Univ. of Uppsala

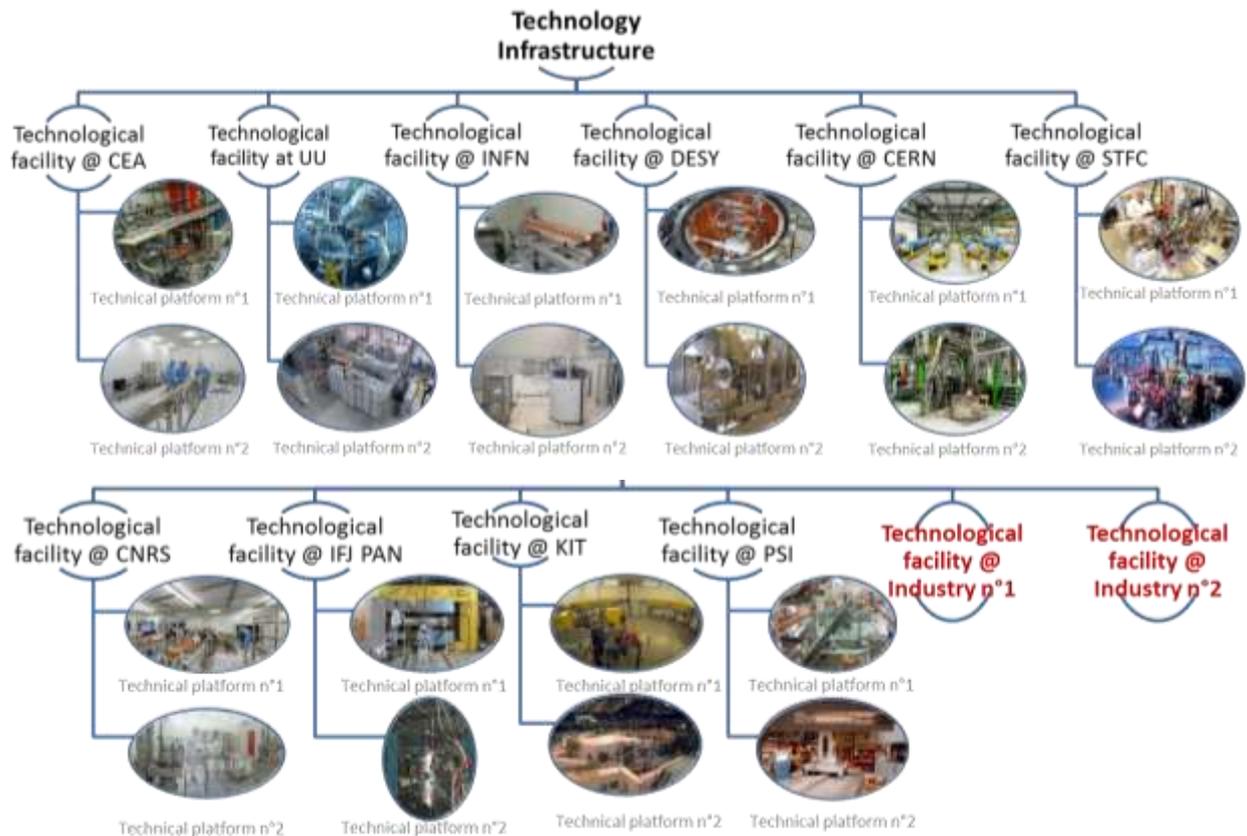


Figure 3: Technology Infrastructure tree structure and terminology

Regarding European industry, the H2020 AMICI project is charged by the EC with the challenging task of building the conditions for consolidating and exploiting these Technological Facilities:

- to strengthen the capabilities of European companies to compete on the global market, as qualified suppliers of components for accelerators and big superconductor magnets, and
- to develop innovative applications in advanced sectors such as healthcare, energy, environment and space.

Its general goal is to propose a model for the profitability and sustainability of the TI, based on the engagement of the European Commission, National Agencies and European Industry, serving innovation and scientific research: two Work Packages are specially addressing the optimization of the future impact and adequacy of the TI to the needs of Society (WP4 *Innovation*) and Science (WP5 *Industrialisation*) applications.

The WP4 *Innovation*-related activities aim at transferring the knowledge and know-how of research laboratories to industry and creating new products and new applications of direct benefit to society. For that purpose, Industry will access a pool of technical platforms made available by European Research Institutes such as test beam facilities, cryogenics, magnet and radiofrequency facilities and test benches, laboratories for material analysis and vacuum technology, for chemistry and surface characterization, for beam electronics and instrumentation, clean rooms and assembly halls including the equipment and the associated human expertise.

The WP5 *Industrialization*-related activities aim at keeping industry at the forefront of the international competition, in terms of technology, quality and costs, in view of the construction of future scientific research instruments in Europe and elsewhere. This will be achieved by fostering collaboration initiatives and opportunities between Industry and the TI that include: research and development of key technology prototypes at high Technology Readiness Level, test and verification of industrial products, professional training and apprenticeship, certification studies and training (e.g. vacuum, cleanliness, welding, etc.), harmonization and standardization studies (e.g. cryogenics, material, etc.).

By mid-2019 the AMICI project will have explored and assessed all the means to ensure that European industry:

- will have a clear information about the strategic science and technology roadmaps for the future accelerator and superconducting magnet-based Research Infrastructures worldwide and therefore they will be in a strong position to compete on the global market,
- will have a simplified and supported access to the most adequate Technical Platforms thanks to the stronger and optimized integration model established among the large existing Technological Facilities,
- will benefit from the integrated ecosystem that will foster innovation based on cutting-edge tools and developments allowing them to enhance their visibility and competitiveness in new markets,
- will overcome their technology development barriers and further develop commercial opportunities within the Research Infrastructures and wider societal markets,
- will profit from the information exchange, definition of harmonized and standardized procedures and access to databases, which should lead to cost reduction in the long term.

2 REVIEW OF THE TYPE OF ACTIVITIES PROPOSED IN THE VARIOUS TASKS IN AMICI

To achieve the goals described in the introduction, the project work breakdown was defined as shown in Table 1. The description of the activities attached to each Task is given in the AMICI Grant Agreement and on the AMICI [Web Site](#). The industry participation is particularly targeted to the tasks in the *Innovation* and *Industrialization* Work Packages. However, the *Strategy* and *Coordination* Work Package activities are also opened to such a participation.

Table 1: AMICI Work Breakdown Structure

Work Package 1: Management, Coordination and Dissemination

- 1.1: Project Management
- 1.2: Organization of the participation of industry
- 1.3: Administrative and financial project management
- 1.4: Communication and outreach activities

Work Package 2: Strategy

- 2.1: Key Technological Areas
- 2.2: Global Landscape
- 2.3: Accelerator and SC magnet Technological Infrastructures Sustainability

Work Package 3: Cooperation

- 3.1: Definition of eligibility criteria
- 3.2: Networking and coordination model
- 3.3: From cooperation to collaboration: elaboration of a collaboration agreement model

Work package 4: Innovation

- 4.1: Industry Survey – Accelerator Technologies
- 4.2: Industry Survey – Magnet Technologies
- 4.3: Identify existing good practises, and barriers to effective engagement, between Industry and the Technological

Work Package 5: Industrialization

- 5.1: Professional training and apprenticeship
- 5.2: Harmonization- Material and Component Reference
- 5.3: Harmonisation - Cryogenic Safety Procedures
- 5.4: Requirements and conditions for developing prototyping in the industry

3 ADDRESSING THE PARTICIPATION OF INDUSTRY TO AMICI

Inviting large enterprises and SMEs to become members and potential beneficiaries in the AMICI project posed one practical and one fundamental difficulty. The practical difficulty resides in the selection of both large enterprises and SMEs on a geographical and topical basis. This would inevitably have led to the selection of a very large panel of industrial members, presumably exceeding the number of the research laboratories themselves and placed the well-focused governance of the project at risk. Conversely, by selecting only a few industrial partners would not have guaranteed a suitable representation and could have given an impression to the excluded companies of unfair treatment, thus weakening the chance of their subsequent involvement in the project activities. The fundamental difficulty resides in the establishment of a common approach and in the identification of common goals within the diversity of applications and business practices.

Instead, in the Grant Agreement it was proposed to insert in the AMICI Work Package 1 ‘Management’ a specific task 1.2 aimed at organizing and activating from the beginning a broad and qualified participation of the industrial partners, through the following sequence of actions:

1. Establish the framework for industrial participation, in collaboration with laboratory Industry Liaison Officers (ILO's) and Technology Transfer offices, and select industries to consult.
2. Convene an 'AMICI Partner and Industry Days' meeting soliciting the widest participation from industry, where the set of activities described in the Grant Agreement as well as the collaboration framework for involving companies, will be presented, discussed and agreed.
3. Collect the availability of industrial companies, organize their participation in these activities, and select industrial representatives on a geographical and/or topical basis.

This work plan has been successfully implemented over the 4-month long initial phase of the project, as reported in this document, which constitutes a contractual deliverable to the European Commission.

4 ACTIONS TAKEN FROM THE PROJECT START

In this section, we detail the actions taken according to the work plan defined in the Grant Agreement.

4.1 Establish the framework for industrial participation

In accordance with the project goal of establishing from the beginning good contacts with the widest audience possible of European Industrial companies actively involved in the relevant sectors, it was indicated in the proposal that the Industrial Liaison Officers (ILO) and Technology Transfer (TT) offices of the major European laboratories represent an effective way of reaching them. Indeed, ILOs and TTs act as interfaces between the laboratories and the industrial world and are endowed with a direct and up-to-date knowledge of the companies' potential contributions and interests.

The list of ILOs setup for AMICI include the ones collaborating with CERN, ESRF, ESS, and Fusion4Energy, for a total of 40 people from 13 European countries (the 7 countries represented in AMICI plus Austria, Belgium, Denmark, Holland, Norway and, Spain,). The list was used first to introduce the ILOs with the AMICI project and, then to extend the invitation to European Industry to participate in the 'AMICI Partner and Industry Days' meeting.

AMICI-Institute representatives were also asked to use of their personal connections to spread information about the AMICI project and meeting.

Finally the project and related events were broadly advertised through the use of the AMICI public website (<http://eu-amici.eu/>) and the handing-out of leaflets (see the AMICI leaflet in appendix).

4.2 Convene a general collaboration meeting

During the first three months, efforts were directed at organizing the 'AMICI Partner and Industry Days for Scientific Technology Infrastructure' meeting which took place in Padua, on April 18-19 2017.

The goal of the meeting was to present the AMICI project to the participating companies, focusing their attention in particular on the Tasks and activities in which industry is going to play an important role, and to collect their comments, suggestions and expressions of interest in order to organize in the most effective way their involvement.

The agenda took into account advice and concerns raised by the Advisory Group during the AMICI kick-off meeting which was held in Paris on January 18, 2017. In particular, an overview of the perspectives for accelerator-based research facilities in Asia and in the Americas was provided through two talks. A poster session to present the Technological Facilities within the AMICI Technology Infrastructure was organized. Following a recommendation from the Advisory Group, the motivation for the meeting and the role expected from industry were clearly explained in a dedicated introduction talk, and further detailed during the subsequent thematic sessions on the different work packages. Note that the work packages which crucially rely on the involvement of industrial partners (Work Packages 4 and 5) were discussed in parallel round table discussions. The agenda also included two industry

presentations of success stories of cooperation between industry and research institutes in order to highlight potential benefits of such a cooperation for European Industry.

The detailed agenda of the ‘AMICI Partner and Industry Days’ is given in the appendix and more information is available at: <https://agenda.infn.it/conferenceDisplay.py?confId=13033>

4.3 Organize the participation of enterprises in the activities

At the end of the meeting the participating companies were asked to fill a questionnaire aimed at collecting feedback on the topics that had been discussed during the previous sessions and, expressions of willingness to participate in the activities. The questionnaire was also sent by email to the registered representatives including those who were not present at the meeting.

5 OUTCOME OF THE MEETING AND RESPONSE FROM THE QUESTIONNAIRE

The meeting gathered 83 participants, with roughly half being from industry (mainly from the countries of AMICI project partners but also from Spain and Denmark) and half from academic institutes.

In total 20 companies eventually delivered the questionnaire, out of 33 attending the meeting.

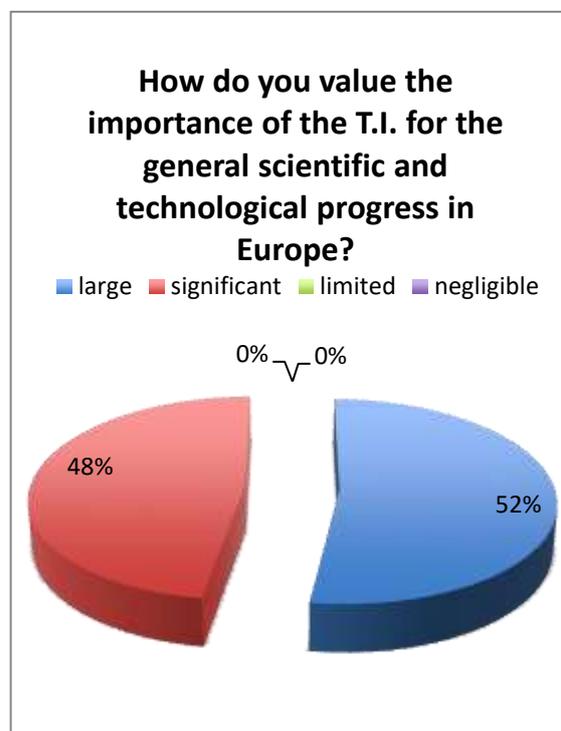
The first set of questions dealt with the general perception by the companies about the role of the European TI and the importance of the various form of collaboration that can be established with them.

The collected answers clearly indicate that there is a common strong appreciation among companies of the scientific and technological support that the TI provides to industry, and the key role this support plays for promoting the development of European high-tech industry.

Industry representatives were then asked to assess the impact for their companies that the collaboration with the TI may have, with respect to the two main goals, i.e.:

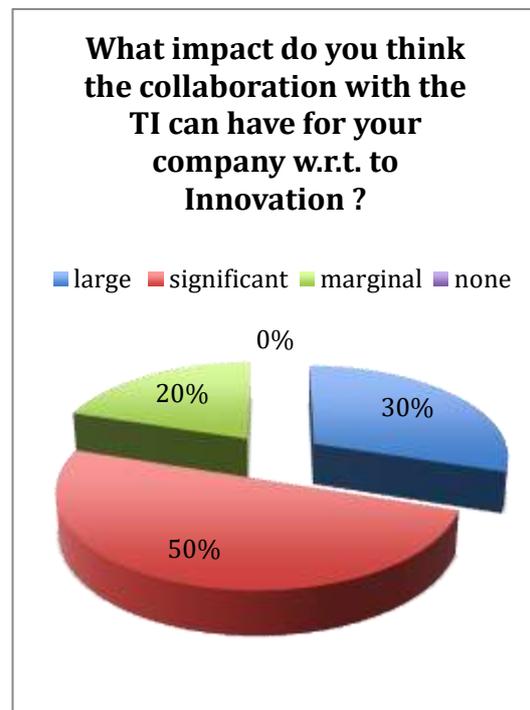
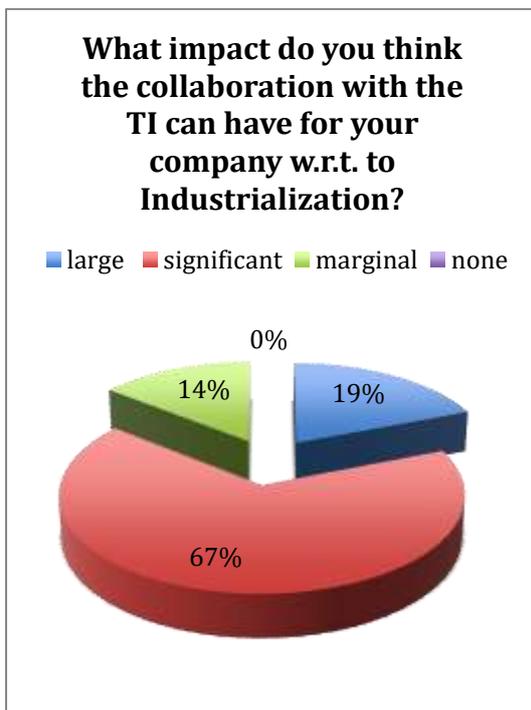
- creating the conditions for the European industry to play a leading role in the realization of future large research infrastructures in Europe and elsewhere (Industrialization)
- promoting innovation for creating new industrial opportunities and enhancing European industry competitiveness outside the research environment (Innovation)

In both cases, the opinion expressed show that there is in general a good expectation that the interaction with the TI will bring concrete benefits by fostering the industry capabilities.



Companies were also asked to indicate which aspects they perceived as the most critical in achieving the AMICI goals. The most common factors mentioned were the following:

- for the first goal (industrialization):
 - information on the plans of the Research Infrastructure,
 - definition of clear rules and roles for participation,
 - exploitation of complementarity between TI and industry,
 - adequate IP management,
 - early involvement of industry in the development of new components and processes
- for the second goal (innovation):
 - effective exploitation of the TI services by industry,
 - adequate IP management,
 - conditions for fair competition,
 - interplay between collaborative activities and competition in tenders
 - facilitated access to EC, national and regional innovation support initiatives and funds



Finally the respondents were asked to express their willingness to participate in the AMICI activities as proposed in the relevant WP tasks.

Three levels of commitment were proposed:

1. interest in maintaining contacts with the project and being informed about initiatives and outcomes of the activities;
2. interest in participating in the survey that will be carried out by the AMICI project;

3. interest in being invited to participate in the working groups and in the survey preparatory group

The outcomes indicate that:

1. for most presented topics a high number of companies are interested in maintaining contact with the project to be informed about the progress of the work and the outcomes; the numbers range, except in one case related to a very specialized activity (from 76% to 91%);
2. there is a moderate interest in participating in surveys regarding general aspects of the collaboration between TI and industry (33%), while the interest is higher for surveys that deal with specific technical topics (from 33% to 62%);
3. a significant number of companies expressed their interest in being involved in the preparation of the surveys (19% to 38%), while the interest turned out to be in general higher for the participation in the working groups (up to 67%, average of 31%).

Overall the outcome of the survey appears very encouraging for an effective and productive involvement of the European Industry in the AMICI project.

The companies that have expressed their wish to receive information on at least one topic will now be included in the project mailing list, while the ones that showed interest in participating in specific activities will be invited by the task leaders to join the relevant working groups.

6 ACTIONS THAT WILL BE TAKEN TO ADDRESS COMPANIES CONCERNS AND ISSUES EMERGING FROM THE ANALYSIS OF THE QUESTIONNAIRE AND FROM THE MEETING DISCUSSIONS

The companies participating in the Padua meeting have provided the AMICI collaboration with a list of issues, concerns and critical aspects that the Steering Committee carefully examined to check that they are addressed in the current project work programme and to extract useful indications for improving the effectiveness of the industry-related activities. The following table shows the result of this analysis.

Issue / concern / critical aspect raised by companies	WP/Task in which the issue will be addressed as described in the initial proposal	Proposed activities and possible additions to or reorientation of the initial proposal
<p>Visibility of the Research Infrastructure planning: Industry representatives would like to have a clear information of the potential market arising from the construction of future RIs on a time scale relevant for them.</p>	<p>WP 2.1 Key Technological Areas: Identify Key Technological Areas (KTA)</p> <p>WP 2.2 Global landscape: Collect the roadmaps of the major research laboratories worldwide for the different KTA identified in WP 2.1.</p>	<p>Updated timelines of the different foreseen projects worldwide will be provided with intermediate milestones and industrial opportunities. Presentation of and/or links to the different roadmaps will be made available on the AMICI website. Industry representatives will be invited to give their view on the KTAs they are most interested in and the timescale relevant for them.</p>

<p>Definition of clear rules for participation: some companies are interested in participating to the elaboration of the TI and are ready for a close cooperation, which could consist in associating industry TF in the TI. To do so, they ask for clear rules of association, in particular rules related to access, secondment of personnel, IP management, etc.</p>	<p>All tasks of WP 3 ‘Cooperation’ WP 3.1 Definition of eligibility criteria: Define eligibility criteria for the participation in the Technology Infrastructure WP 3.2 Networking and coordination model: Develop a coordination model for the use of the Technological Facilities WP 3.3 From cooperation to collaboration: elaboration of a collaboration agreement model: Standardize collaboration agreements</p>	<p>In the AMICI proposal, the establishment of the considered Technology Infrastructure is relying mainly on the cooperation between research institutes hosting large Technological Facilities: these institutes should define the criteria for participating to the TI, the rules of association or access to the TFs. Companies possessing technological facilities will be consulted and their suggestions and expectations taken into account to establish a model with clear rules.</p>
<p>Exploitation of the complementarity between TFs located at research institutes and those located in industry: some companies have expressed the wish that their TFs are considered. In particular, the work that companies are able and / or better equipped to provide should be performed on their own platforms and not in research institutes.</p>	<p>WP 3.1 Definition of eligibility criteria: Perform a census of Technical Platforms and classify them under technological areas. This analytical approach will allow to identify synergies, complementarities and duplication. WP 5.1 Professional training and apprenticeship: Promote cross fertilization between research laboratories and industry. Seconded personnel from either side may acquire knowledge and be trained on new techniques, equipment and methodologies. WP 5.4 Requirements and conditions for developing prototyping in industry: Define the requirements and conditions that will make it attractive, feasible and effective to engage companies in developing prototypes of accelerator components or large superconducting magnets.</p>	<p>In WP3.1, the census of Technological Facilities (TF) at research institutes, will be extended to industry and organized in a way that will allow potential users to identify the most appropriate TF according to their technology needs. The organization in WP5.1 and WP5.4 of professional training and prototyping between research institutes and companies will also contribute to a better understanding of the capabilities and capacities available on both sides. It will be ensured that companies have all the necessary information.</p>

<p>Adequate IP management</p>	<p>WP 4.3 Identify existing good practices and barriers to effective engagement between industry and the TI: Areas to be investigated include Intellectual Property policy, patenting rules, knowledge sharing and other critical rules related to the exploitation of competences, equipment and services available at the TI and in industry.</p> <p>WP 3.3 From cooperation to collaboration: elaboration of a collaboration agreement model: IP is clearly an issue that needs to be addressed in collaboration agreements.</p> <p>WP 5.1 Professional training and apprenticeship</p>	<p>In WP 4.3, the experience related to the management of IP between research institutes and companies or between companies participating to the same project will be shared. It is unlikely that a common solution can be found but companies will be consulted and asked to report on the problems they encounter and on examples of successful IP management. This should be then lead to proposing several possible drafts for the model of collaboration agreement in WP 3.3.</p> <p>IP management may also be addressed in WP5.1.</p>
<p>Early involvement of industry in the development of new components and processes: an earlier and closer involvement of industry in the development of new components and processes by research laboratories, could lead to making the production and assembly more efficient, streamlined and cost-effective.</p>	<p>WP 5.4 Requirements and conditions for developing prototyping in the industry: Define the requirements and conditions that will make it attractive, feasible and effective to engage companies in developing prototypes of components larger parts of accelerators or large superconducting magnets in collaboration with the TFs.</p>	<p>In WP 5.4, companies will be asked express their requests and suggestions concerning the conditions for developing prototypes. The use of the pre-commercial procurement tool will be investigated.</p>
<p>Effective exploitation of the TI services by industry: the characteristics and specificity of the different TFs should be well established in order to have a clear view of the services that can be offered to industry and how to optimize their use.</p>	<p>WP 3.1 Definition of eligibility criteria: The census and descriptions of Technical Platforms should be used to extract useful information about what services can be provided by the TFs to industry</p> <p>WP 1.4 Communication and outreach activities: a page will be set up as a guide for industries which are looking for partners in research institutes.</p>	<p>The website will present the different TFs available within the institute partners of AMICI with their detailed characteristics and the access policy. The definition of clear rules for participation in the foreseen TI will also help its effective exploitation by industry.</p>

<p>Conditions for fair competition, interplay between collaborative activities and competition in tenders: having some companies closely associated with research institutes within a structure in which R&D, prototyping and mutual training is done raises problems of fairness of competition with non-participating companies when it comes to the calls for tender.</p>	<p>Currently, no task deals with this issue.</p>	<p>This issue will be addressed in WP 4.3 <i>Identify existing good practices and barriers to effective engagement between industry and the TI.</i> A first analysis of constraints and opportunities in the European and national legal frameworks for procurement rules could be performed by slightly extending the scope of WP3.3 <i>From cooperation to collaboration.</i></p>
<p>Facilitated access to European, national and regional innovation support initiatives and funds.</p>	<p>WP 2.3 Accelerator and SC magnet Technological Infrastructure sustainability. A first TF census is currently being carried out of ongoing component development and test projects at each TF, the sharing of the costs for these project between the TF and its project partners, the financial support received from national sources for operating the TF for such projects and the current view the TF has of its own sustainability.</p>	<p>Among the proposals which will be made to guarantee the long term sustainability of the TI, some should explore the possibility to access to innovation initiatives and funds at the national, regional and European level. Conclusions will be made available to companies associated to AMICI.</p>
<p>Organize specific industrial days for the different technological areas (magnets, accelerating cavities, sensors...).</p>	<p>WP 1.4 Communication and outreach activities: Organize European Forum on accelerator and SC magnet TI at Month 24</p>	<p>This Forum could be the occasion of organizing parallel sessions for the different areas. Companies will be associated to the organization of the event.</p>
<p>Provide information about calls for tenders (CfT) that are below the EU contract publication threshold: many companies were complaining that they are not aware of all the CfT of interest for them mainly because they are used to work in a limited domain. AMICI encompassing all the domains of applications of accelerator and superconducting magnets could help them to have access to a broader range of CfTs.</p>		<p>The Project Coordination Team will collect the links to the various CfT repositories and post them on the AMICI website.</p>

7 ORGANIZATION OF THE VARIOUS LEVELS OF INDUSTRY ENGAGEMENT IN AMICI

As described in Section 5, companies have shown interest in all the levels of involvement proposed to them, i.e.: establishing and exploiting contacts with the TI, participation in the surveys and involvement in the working group activities.

7.1 Establishing and exploiting contacts with the TI

The interaction with companies during and after the Padua workshop clearly indicated that, besides demonstrating a general interest in being informed about the project activities, companies also wish

- to be presented with the most transparent vision of the evolution of Research Infrastructure plans and related technology developments;
- to start exploring the possibility of exploiting the services that the AMICI Technology Infrastructure can offer.

Therefore the AMICI collaboration will organize the first level of interaction with Industry at large providing the following to Industry:

- in addition to the regular update of the Research Infrastructure activities progress, also up-to-date information on key RI developments: the information will be conveyed through the ILOs network, the AMICI web site and a second meeting that will be organized in Month 24;
- in addition to the description of the components of the AMICI Technology Infrastructure already available on the project web site, an interactive structured map of the available services will be made available to facilitate industrial partners in identifying those matching their needs as part of the task WP3.1 and WP1.4;
- a common access point at which requests to the AMICI TI for services may be submitted - the Steering Committee will take care of collecting the current availability of services at the technological platforms and communicate it to the requester.

7.2 Organization of the surveys

It's important that the surveys targeting the European Industry are carried out by contacting a suitable selection of companies to guarantee the representativeness and the significance of the outcomes. A first group of companies interested in participating in the surveys already emerged from the workshop. In addition, the contacts already established with the European ILOs will be exploited to collect additional candidates. Information on the number and relevance of suppliers in the various industrial sectors, provided by the procurement offices of European Research Institutions, will be used to cross-check the quality and consistency of the samples.

7.3 Involvement of the companies in the working group activities

The companies willing to participate in the AMICI working groups will be invited by the task leaders to join the groups. If the presence of the Industry participants is not deemed sufficient, the ILOs will be asked to propose additional companies among the most representative for the group activities in their lists. The following table shows the number of interested companies per task, and their level of interest.

	Interest expressed by the company	Number of companies which expressed this interest
WP2 STRATEGY		
T2.1 and 2.2	<input type="checkbox"/> being informed about the outcomes	18
T2.1 and 2.2	<input type="checkbox"/> participating in the survey	7
WP3 COOPERATION		
T3.1	<input type="checkbox"/> being informed about the outcomes	17
	<input type="checkbox"/> participating in the survey	7
T3.2	<input type="checkbox"/> being part of the network	18
T3.3	<input type="checkbox"/> being informed about the outcomes	19
	<input type="checkbox"/> being invited to participate in the working group	7
WP4 INNOVATION		
T4.1	<input type="checkbox"/> being informed about the outcomes	19
	<input type="checkbox"/> participating in the survey	13
	<input type="checkbox"/> participating in preparing the survey	4
T4.2	<input type="checkbox"/> being informed about the outcomes	16
	<input type="checkbox"/> participating in the survey	7
	<input type="checkbox"/> participating in preparing the survey	5
T4.3	<input type="checkbox"/> being informed about the outcomes	19
	<input type="checkbox"/> participating in the survey	12
	<input type="checkbox"/> participating in preparing the survey	8
WP5 INDUSTRIALIZATION		
T5.1	<input type="checkbox"/> being informed about the outcomes	17
	<input type="checkbox"/> being invited to participate in the working group	6
T5.2	<input type="checkbox"/> being informed about the outcomes	17
	<input type="checkbox"/> being invited to participate in the working group	4
T5.3	<input type="checkbox"/> being informed about the outcomes	10
	<input type="checkbox"/> being invited to participate in the working group	2
T5.4	<input type="checkbox"/> being informed about the outcomes	19
	<input type="checkbox"/> being invited to participate in the working group	14

8 APPENDIX

Tuesday, 18 th April 2017	Wednesday, 19 th April 2017
<p>Introduction Convener: Dr. Mauro Morandini (INFN)</p> <p>14:00 Welcome Address</p> <p>14:10 The AMICI project: motivation and goals of the meeting Dr. Olivier Napoly (CEA)</p> <p>The future of accelerator based research facilities: opportunities and challenges for industry Convener: Dr. Sylvie Liray (CEA)</p> <p>14:40 Accelerator perspectives in the Americas Dr. Andrew Hutton (JLab)</p> <p>15:10 Particle accelerators and applied superconductivities in Asia Dr. Akira Yamamoto (KEK)</p> <p>15:40 Research Infrastructures and Technology Infrastructure: an essential link for the development of science in Europe Dr. Philippe Chamaz (CEA)</p> <p>16:10 - 17:00 Coffee break and posters</p> <p>The role and the future of Technological Infrastructures in Europe Convener: Dr. Olivier Napoly (CEA)</p> <p>17:00 Challenges in superconducting magnets Dr. Luca Bottura (CERN)</p> <p>17:20 Technological infrastructure and industry: a success story SC magnets Dr. Michael Gehring (BNG)</p> <p>17:35 Technological infrastructure and industry: a success story RF cavities Dr. Giorgio Corniani (ZANON)</p> <p>17:50 Organisation of the 'AMICI-Industry partnership session' Dr. Mauro Morandini (INFN)</p> <p>18:10 Discussion</p>	<p>Round Table Discussion 1 Chairman: Pasquale Fabricatore (INFN)</p> <p>08:30 Introduction</p> <p>08:40 Professional training and apprenticeship Conveners: Dr. Stéphane Berry (CEA), Dr. Eric Giguet (Alsyom)</p> <p>09:20 Harmonization - Material and component reference Conveners: Dr. Mohammed Fouaidy (CNRS), Mr. Bernd Spaniol (Heraeus PSDF Deutschland GmbH&Co.KG)</p> <p>10:00 Prototyping with industry Conveners: Dr. Paolo Michelato (INFN), Mr. Giorgio Corniani (Ettore Zanon s.p.a.)</p> <p>Round Table Discussion 2 Chairman: Anthony Gleeson (STFC)</p> <p>08:30 Introduction</p> <p>08:40 Industry Survey - Accelerator Technologies Conveners: Dr. Anthony Gleeson (STFC), Dr. Sophie Muller (Thales Comm. and Security)</p> <p>09:20 Industry Survey - Magnet Technologies Conveners: Dr. Pierre Védrine (CEA), Dr. Ziad Helhem (Oxford Instruments NanoScience)</p> <p>10:00 Good practices and barriers Conveners: Dr. David Alesini (LNF), Dr. Andrea Ceracchi (CECOM)</p> <p>10:00 - 10:45 Coffee break and Posters</p> <p>The collaboration with industry in the AMICI project 1/2</p> <p>11:25 Strategy: goals/activities and discussion Dr. Walid Kaabi (CNRS)</p> <p>12:05 Cooperation: goals/activities and discussion Dr. Riko Wichmann (DESY)</p> <p>12:45 - 14:15 Lunch</p> <p>The collaboration with industry in the AMICI project 2/2</p> <p>14:15 Summaries of round tables</p> <p>14:35 General discussion</p> <p>15:00 Industry feedback</p> <p>15:20 Close out</p>

Figure 1: Agenda of the “AMICI Partner and Industry Days for Scientific Technology Infrastructure”

WEBSITE:
<http://eu-amici.eu/>

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PARTICIPATING EUROPEAN RESEARCH INSTITUTES

 Commissariat à l'Energie Atomique et aux Energies Alternatives (CEA, France)	 European organization for nuclear research (CERN, Switzerland)
 Stiftung Deutsche Elektronen-Synchrotron (DESY, Germany)	 Istituto Nazionale di Fisica Nucleare (INFN, Italy)
 The Henryk Niewodniczanski Institute of Nuclear Physics, Polish Academy of Sciences (IFJ PAN, Poland)	 Centre National de la Recherche Scientifique (CNRS, France)
 Science and Technology Facilities Council (STFC, UK)	 Uppsala Universitet (Uppsala, Sweden)
 Paul Scherrer Institut (PSI, Switzerland)	 Karlsruher Institut für Technologie (KIT, Germany)



ACCELERATOR AND MAGNET INFRASTRUCTURE FOR COOPERATION AND INNOVATION



THE AMICI HORIZON 2020 PROJECT AIMS TO:

- FOSTER INNOVATION** in the field of particle accelerators and superconducting magnets
- FACILITATE INDUSTRIALISATION** by creating an open and easily accessible Technology Infrastructure for European Industry to use
- ENSURE SUSTAINABILITY** of the Technological Facilities




STRATEGY

Identify the strategic elements necessary to successfully implement a sustainable cluster of Technological Facilities in partnership with industry.

Activities: identify Key Technological Areas; collect the roadmaps of the different scientific domains using accelerators and superconducting magnets worldwide.

Benefits for European Industry: get a clear view of the strategic roadmaps; be in a strong position to compete on the global market.





INNOVATION

Promote the potential applications of mature technologies to European Industry

Activities: assess the current capability and future potential of a broad range of European commercial organisations to innovate; identify domains of societal applications and potential markets beyond Research Infrastructures; analyse good practices and barriers to effective engagement of the TPs.

Benefits for European Industry: overcome technology development barriers; further develop commercial opportunities within the research institutes and wider societal markets.


COOPERATION

Define the conditions of the coordination of Technological Facilities (TFs).

Activities: define the eligibility criteria for the participation in the Technology Infrastructure; develop a coordination model for the use of eligible TFs; standardise collaboration agreements.

Benefits for European Industry: profit from the information exchange; definition of standardised procedures and access to databases, which should allow cost reduction in the long term.

EXAMPLES OF TECHNICAL PLATFORMS AVAILABLE TO EUROPEAN INDUSTRY

- Test beam facilities
- Test stations for superconducting magnets and large size cryogenic components
- Test stations under high magnetic field
- Characterisation stations at cryogenic temperature
- Test stations for RF devices and superconducting cavities
- Chemistry, clean room and assembly facilities for superconducting cavities and cryomodules
- Characterisation and measurement laboratories
- Superconducting magnet winding and impregnation laboratories


INDUSTRIALISATION

Share with industry the needs, knowledge, techniques and quality standards of the research institutes.

Activities: define the framework for apprenticeship programs; set the basis for common knowledge and use among TPs and related laboratories and industries; standardise cryogenic safety procedures; define the requirements and conditions for developing prototypes within industry.

Benefits for European Industry: get a simplified and supported access to the most adequate platforms; be at the forefront of the international competition, in terms of technology, quality and costs.

Figure 2: AMICI leaflet