Deliverable D4.6: *Final report on engagement with the private sector*

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Comments	*This progress report describes the level of interaction with industry users and partners, including infrastructure usage through transnational access and research collaborations. Feedback from a survey of users from the private sector is used to inform future recommendations for the research infrastructure.*

EUROCHAMP-2020 has an extensive range of simulation chamber facilities and calibration centres that can serve as excellent testbeds for a wide range of instruments and technologies. Highly specific atmospheres can be generated in response to the particular needs of industry users and the performance of products can be evaluated through comparison with a range of reference measurements. Performance can also be tested under a variety of conditions (different types and concentrations of gases and particles, temperature, relative humidity, light intensity etc.) and many technical aspects such as stability, reproducibility and interference from specific atmospheric constituents can all be assessed. The EUROCHAMP research infrastructure thus has huge potential as a platform for providing support to industry users in a number of key technological areas, including; development and manufacture of scientific instruments, gas and particle sensors, de-polluting materials and the atmospheric impact of new chemical products.

Interactions with industry encompass three areas of activity: direct engagement, Transnational Access and ongoing research collaborations.

Direct Engagement

Members of the EUROCHAMP-2020 consortium have established links with over 70 companies/SMEs in the private sector. Nine of these companies were Associated Partners in the project, while five innovation managers from the private sector were members of the Innovation Advisory Board. EUROCHAMP-2020 partners are in regular contact with their industry partners and many also have ongoing research collaborations, as highlighted below.

The Innovation Advisory Board recommended two main courses of action to attract new users from the private sector; (i) develop and maintain a high level of activity on social media (Twitter and LinkedIn) to promote EUROCHAMP-2020 services to a large audience, and (ii) to attend targeted conferences and trade fairs to engage with potential users directly.

The Twitter activity has been especially successful in raising the profile of the research infrastructure; with 511 tweets posted and almost 1000 Followers, Figure 1.

Figure 1. Screenshot of the EUROCHAMP-2020 Twitter page (accessed 16th September 2021).

The following three conferences were targeted in order to reach potential new partners and users in the private sector:

- 1st EU Environmental Research Infrastructures–Industry Joint Innovation Partnering Forum (Grenoble, France, 18-19 May 2017): http://www.envriplus.eu/2017/01/26/1st-eu-environmental-ris-industry-forum/. This event facilitated fruitful discussions on the way forward for industry-academia partnerships within the research infrastructures framework. It also provided excellent networking opportunities and face-to-face meetings with potential industry users.
- Analytica 2018, the world's largest trade fair in analytical scientific equipment (Munich, Germany, 31 March - 3 April, 2018): (https://www.analytica.de/index-2.html).
- Pollutec 2018, international trade show for environmental equipment, technologies and services (Lyon, France, 27-30 November, 2018) (http://www.pollutec.com/).

Figure 2. Engaging with potential industry users at Analytica (left) and Pollutec (right).

Transnational Access

Transnational Access (TNA) to 16 atmospheric simulation chambers and four calibration centers was available for industry users free of charge. The TNA was advertised through the project's home page, social media channels and the websites of individual partners. TNA for new industry users was also promoted at international trade fairs.

The EUROCHAMP-2020 Project Office prepared a set of instructions to facilitate the application process and provided assistance whenever needed. New industry users were offered advice (by the WP4 leader and by the Project Office) on the facilities that were most suitable for their needs. Once a facility had been identified, the host partner worked with the industry user on the design of the experiments/tests required and in preparing the TNA form.

Overall, there were 12 TNA awards involving industry users in EUROCHAMP-2020. Summary details are provided in Table 1.

Table 1. TNA projects involving industry users in EUROCHAMP-2020.

Industry name, country	Project title	Chamber (Partner)
ENOVEO, France	Microbial Life in Frost Flowers: determining seeding sources and spatial structure	RvG-ASIC (UEA)
Ionicon Analytik GmbH, Austria	Direct aerosol chemistry investigations with advanced mass spectrometric methods	PACS-C3 (PSI)
Blue Industry and Science, France	Factory boundary pollutants monitoring	EUPHORE (CEAM)
Environmental Physics Bologna, Italy	Characterization and calibration of a new instrument for filter-based measurement of aerosol absorption coefficient at 5 wavelengths	CESAM (CNRS-LISA)
PM_TEN, Italy	Characterization of a Blaustein Atomizer system	CESAM (CNRS-LISA)
Aerodyne Research, USA	EESI-Vocus Optimization, Kalibration, and Evaluation (EVOKE)	PACS-C3 (PSI)
Ionicon Analytik GmbH, Austria	EUROCHAMP PTR-MS Intercomparison Campaign	HELIOS (CNRS-ICARE)
ENI (Ente Nazionale Idrocarburi), Italy	Determination of the enhancement factor and of the size distribution for secondary PM formed during atmospheric aging of gasoline vehicle exhaust	ILMARI (UEF)
Catalytic Instruments GmbH & Co. KG, Germany	Assessment of the Influence of Photochemical Aging on the Physical, Chemical, and Optical Properties of Black Carbon Particles	MAC-MICC (UMAN)
Haze Instruments, Slovenia	Aerosol absorption enhancement due to realistic coatings - different instrumental approaches and calibration	CCSM (PSI)
U-Earth Biotech Ltd, Italy and UK	AIRTIME: AIrcel peRformance aT helIos chaMbEr	HELIOS (CNRS-ICARE)

Optind Solutions Ltd, India	Characterization of a broadband integrating nephelometer over the wavelength range 400 and 550 nm: Aerosol optical parameter retrieval	IASC (UCC)

Research Collaborations

Private sector companies have also been using the EUROCHAMP-2020 infrastructure through a wide range of formal and informal research collaborations, summarised in Table 2 below.

Table 2. Summary of research collaborations (outside of TNA activities) between EUROCHAMP-2020 partners and private sector companies.

Partner	Industry name, country	Description of Activity
CNRS-LISA	PlumeLabs, France	Evaluating the performance of new air quality sensors; identification of cross-sensitivities and potential artefacts, to aid the optimisation of algorithms for data generation.
BUW	BASF, Germany	Research project to study the effects of photochemical smog on various products.
KIT	Palas GmbH, Germany	Development and calibration of instrument specific aerosol sensors.
KIT	schnaiTEC GmbH, Germany	Development of instruments for monitoring combustion particles and cloud particles.
KIT	Bilfinger Noell GmbH, Germany	Development of a new and innovative mobile instrument for atmospheric measurements of ice nucleating particles (INP). The instrument is the first of its kind for fully-automated long term INP measurements at high sensitivity and time resolution.
CEAM	PORCELANOSA, Spain	Testing the performance of a new photocatalytic material under a variety of simulated atmospheric conditions in the EUPHORE chamber.
CEAM	A number of SMEs from several countries	Assessing the performance of low-cost sensors in the context of using CO_2 measurements as a proxy of ventilation rate and risk of COVID-19 infection.
CNRS-ICARE	Chromatotec, France	Development, testing and improvement of GC-MS instruments.

FORTH	Fasmatech, Greece	Development and testing of a new time-of-flight mass spectrometer for measurements of volatile, intermediate volatility, and semi-volatile organic compounds in the atmosphere.
FORTH	Thrace Plastics, Greece	Rapid testing of a wider range of materials and their combinations (in layers) for the construction of masks that can be used for prevention of transmission of covid.
UEF	ENI, Italy	Investigations of the effects of fuel reformulations on secondary aerosol formation potential of passenger vehicle emissions
UEF	Vitrocell Systems GmbH, Germany	Testing of aerosol air-liquid interface cell exposure systems in toxicological studies of air pollutants
INFN	PM_TEN & Dado lab, Italy	Development and testing of a new sampler for size-segregated, continuous sampling of airborne particulate matter.
INFN	C.P.G. LAB Srl, Italy	Testing of low-cost aerosol and gas monitors, developments of techniques to explore the interaction of nanoparticle with electromagnetic radiation.
INFN	Comune di Genova, Italy	Testing of low cost air quality and meteorological sensors
UAIC	CONITECH Ltd, Romania	Design and construction of a new temperature control system for the ESC-Q-UAIC chamber to enable studies from 2°C to 40°C.
NCAS-UEA	AutoNaut Ltd, UK	Investigations into ice-repellent materials and coatings to enable deployment of the AutoNaut unmanned surface vessel in cold environments.

Six of our research collaborations have been posted on the "Success Stories" page on the Innovation section of the EUROCHAMP-2020 website to highlight successful collaborations between EUROCHAMP-2020 partners and the private sector, Figure 3. This helps demonstrate how the chambers and calibration centres can be used for TNA visits and collaborative research.

Figure 3. Web page highlighting successful collaborations with the private sector.

Results from the Survey of Industry Users

The EUROCHAMP-2020 survey on user needs and collaborations with the private sector was conducted at the very end of project, in August 2021. All industry collaborators were invited to participate. The link to the survey is: https://forms.gle/8WKM43nEtTB3MFSM6. A pdf download of the survey and the anonymised responses is provided in the Appendix.

- The survey was completed by 12 people from 11 different companies based in 7 different countries.
- The size of the companies ranged from start-ups (33%) to SMEs (42%) and large multi-nationals (25%).
- Scientific instrument development and manufacture (50%) was the most represented industry sector, followed by pollution abatement (16.7%) and software, services, data for environmental technologies (16.7%).
- Most respondents were starting a new collaboration with a EUROCHAMP-2020 partner (41.7%), while some were one-off users (25%) and long-term collaborators (8.3%).
- The vast majority of respondents discovered EUROCHAMP-2020 through a personal contact in their network (82%).
- 58% of respondents accessed chamber facilities in a different country to which they are based.
- The collaborations were supported by the TNA programme (33%), company funds (33%) and other sources (33%), including research awards.
- The collaborations supported the companies at all stages of their research, development and innovation process (pre-competitive research, feasibility studies, proof-of-concept, commercialisation and ongoing product development).
- The EUROCHAMP-2020 partners provided a wide range of services for private sector users including, access to chamber and calibration facilities, co-design of tests and experiments, specialist training on chambers and associated instrumentation.
- When asked about their overall experience of working with their EUROCHAMP-2020 partner, 75% of respondents gave the top rating (5 on a scale of 1 to 5).

- The industry users indicated that the collaboration with EUROCHAMP-2020 produced a range of tangible benefits for their company including product development, improved testing protocols, knowledge generation and publicity.
- The collaborations have also stimulated further research and several companies are seeking long-term relationships with EUROCHAMP-2020 partners.
- The most popular measures to further develop collaborations with EUROCHAMP-2020 partners were EU or nationally funded projects (41.7%), match-making events (25%) financial subsidies (16.7%) and industry training programmes (16.7%).
- The respondents indicated that the most efficient ways to promote new collaborations would be participation in events and industry trade fairs combined with effective use of social media and networking.

Recommendations for the future

The feedback from the survey is very positive and indicates that the EUROCHAMP-2020 partners have been effective in providing valuable services to private sector companies. Going forward, there are a number of recommended actions to support and enhance collaborations with the private sector:

- Continue to promote the chambers and calibration facilities by participating in targeted conferences and industry trade fairs.
- Maintain a high level of activity on social media and continue to expand the network of contacts in the private sector.
- Continue to review and, if necessary, streamline the administrative procedures for access and data usage in order to lower the bureaucratic hurdles to industry co-operation.
- Investigate and pursue research funding opportunities with companies, especially start-ups and SMEs with limited financial resources.

Some EUROCHAMP-2020 partners are now involved with ACTRIS and many of these actions can be carried out within that framework. However, it is also important that EUROCHAMP-2020 partners continue to operate and engage with users at both the national and European level, in order to achieve sustainability.

Appendix: screenshot of the first page of the survey.

EUROCHAMP 2020

EUROCHAMP-2020 survey on user needs and collaborations with the private sector

Since 2009, EUROCHAMP has been actively promoting access to a large variety of atmospheric simulation chamber facilities in Europe. Over the last 12 years, access has been provided to a wide range of users from the research community as well as the private sector.

The aim of this survey is to obtain information about past and current collaborations between EUROCHAMP partners and the private sector, as well as useful feedback that can be used to improve the facilities and services that we provide for companies working in scientific research and innovation.
We kindly invite you to share your experience and your views on EUROCHAMP services by participating in this 10 minute online survey.

Please complete this form by 30 August 2021.

For any questions or technical problems, please contact John Wenger (j.wenger@ucc.ie) of Matilde Oliveri (matilde.oliveri@lisa.ipsl.fr).

Thank you very much for your valuable cooperation!

John Wenger (Innovation Platform leader)
Matilde Oliveri (EUROCHAMP-2020 Project Office)

A pdf download of the survey and the anonymised responses is provided below.

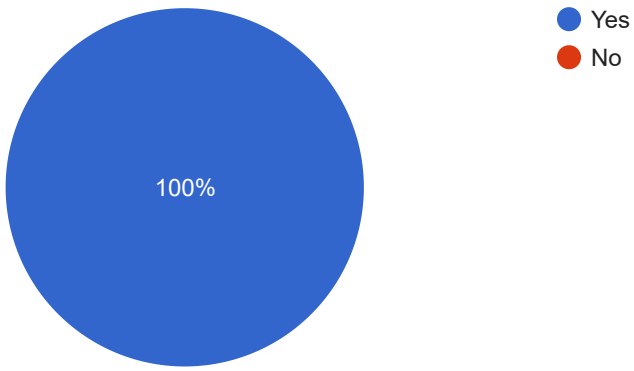
EUROCHAMP-2020 survey on user needs and collaborations with the private sector

12 responses

Publish analytics

Informed Consent

12 responses



First name and last name

12 responses

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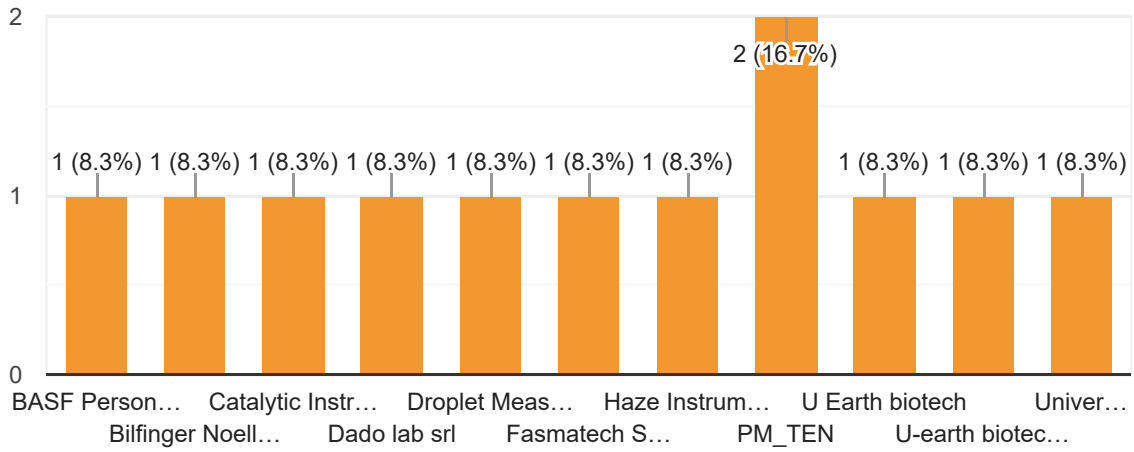
Organization/company

12 responses



Role

12 responses

Engineering

Scientist

Magnet Technology, Head of Business Development and Sales

Director of Business Development

professor

CEO

Sales director

Laboratory Analyst

Senior Manager Automation, Hair Care Performance and Data Management

Email address

12 responses

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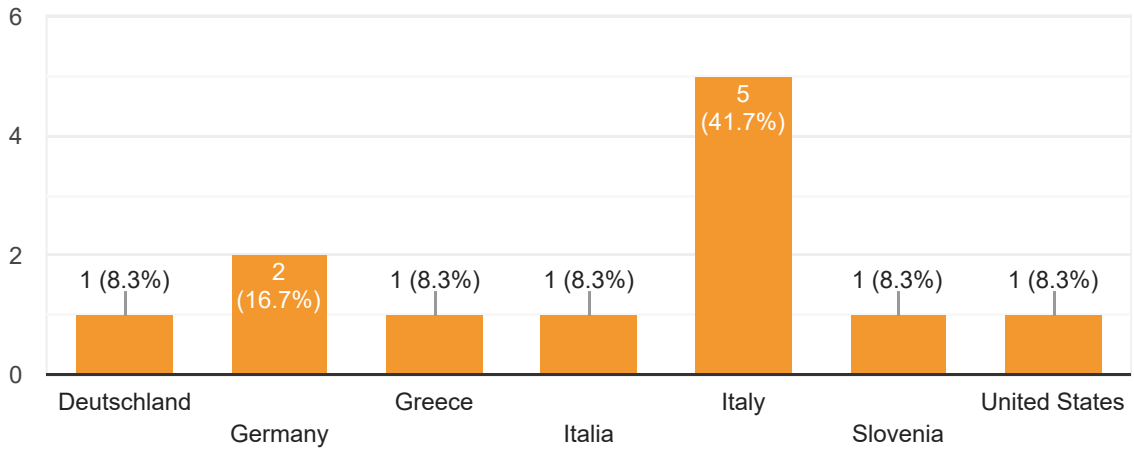
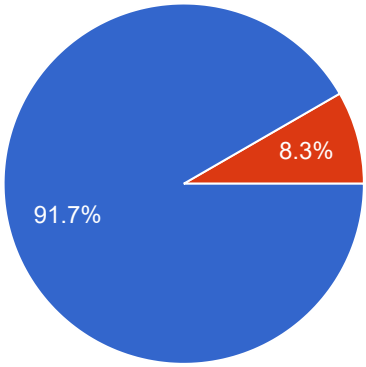
In which country is your company located?

12 responses



Gender

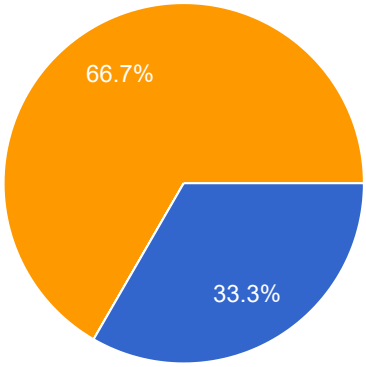
12 responses



- Male
- Female
- Prefer not to say
- Other

Your answers are on behalf of:

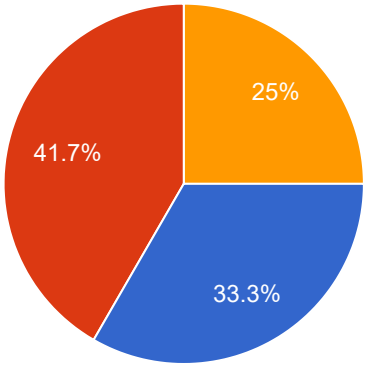
12 responses



- Yourself
- Your department
- Your whole organization/ company

What is the size of your company?

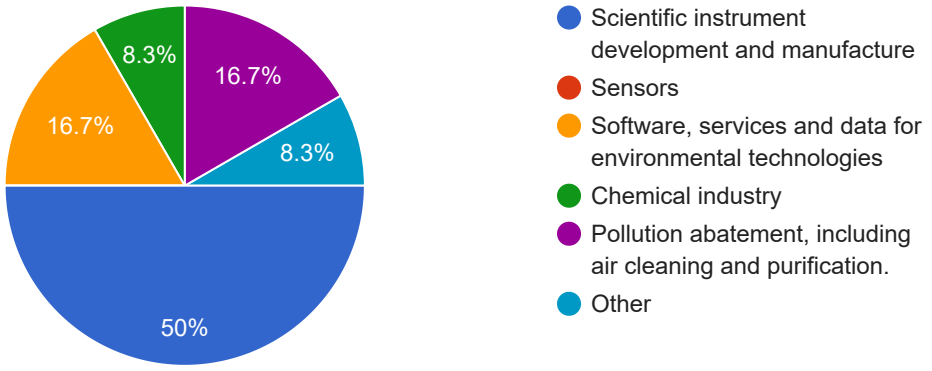
12 responses



- Start-up or micro company (staff headcount: 1-9)
- Small to medium size enterprise (SME) (staff headcount: 10-250)
- Large company (staff headcount: > 250)

Which sector is your company in?

12 responses



If you ticked “Other”, please add further details:

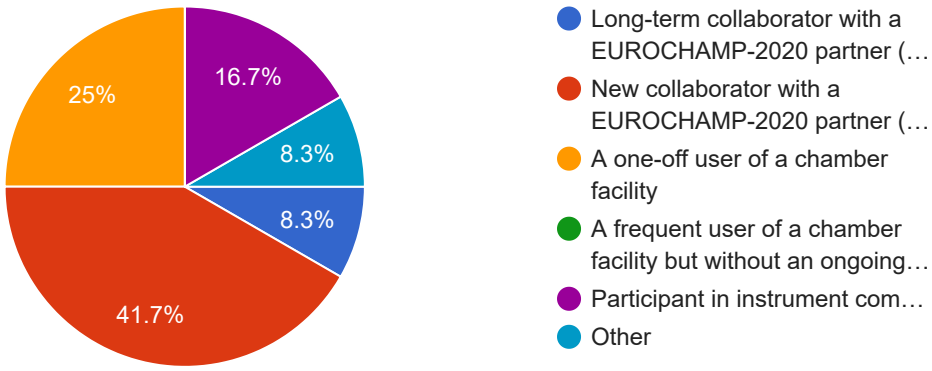
1 response

Education/Research

Your relationship with EUROCHAMP-2020

What best describes the nature of the relationship between your company and EUROCHAMP-2020?

12 responses



Please add further details:

7 responses

Won an european project and gained a 3 weeks access to HELIOS smog chamber

We developed an INP instrument togenthe with a scientific partner

The intercomparison of instruments is paramount to establish normalized and standardized results. The science community via universities, institutes and other entities are leading the path for instrument manufacturers in how and why to quantify and validate their scientific discoveries, which are the basis for a educated and substantiated decision process.

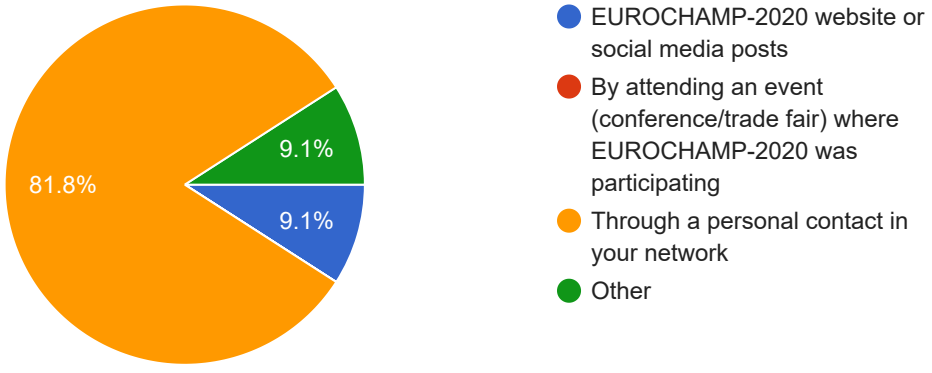
We used the ILMARI chamber to determine the enhancement factors and of the size distributions for secondary PM formed during atmospheric aging of gasoline vehicle exhausts burning different reformulated fules produced by Eni (the Italian oil company)

Master thesis

Fasmatech's new PTR TOF MS platform will be connected to the chamber and

If you or your company are new collaborators or users, how did you come to know about EUROCHAMP-2020 facilities and services?

11 responses



Please add further details:

6 responses

Contacted thanks to our senior project manager

European Project

I went in touch with collegaues at the University of Eastern Finland in Kuopio after asking information to EUROCHAMP

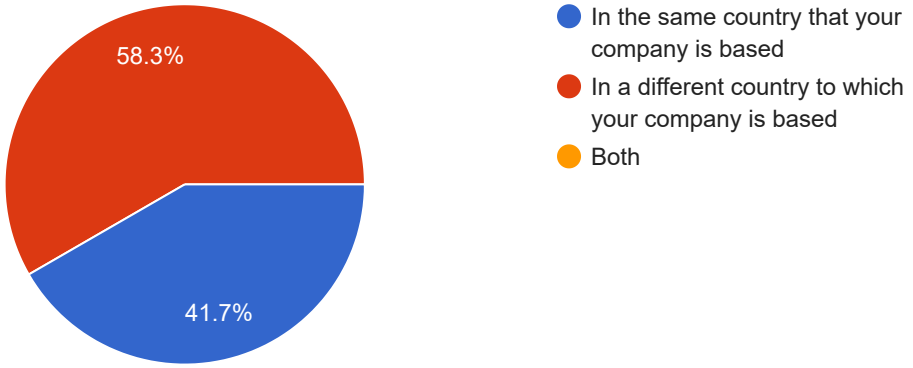
We cooperate with INFN Genova for optical sensors development

Prof Spyros Pandis

Long term collaboration with PSI, Tropos, UH, UC...

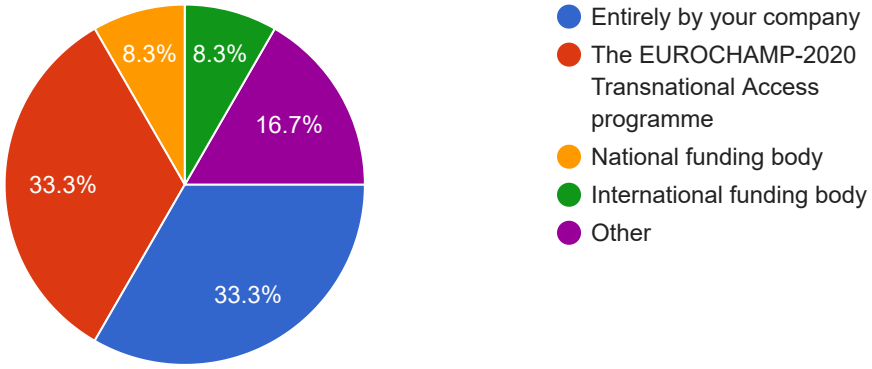
Where did your company access chamber facilities?

12 responses



How was your collaboration with EUROCHAMP-2020 supported financially?

12 responses



If you ticked “Other”, please add further details:

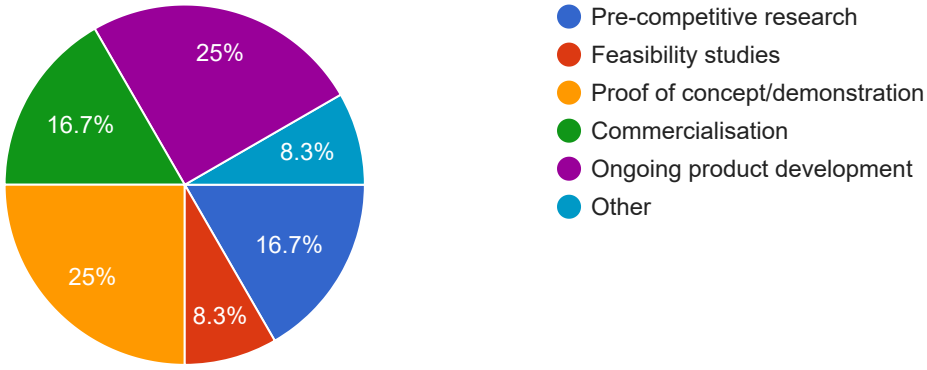
2 responses

Not yet used directly

With additional own funding.

At which stages of your company’s research, development and innovation process did you access EUROCHAMP-2020 facilities and services?

12 responses



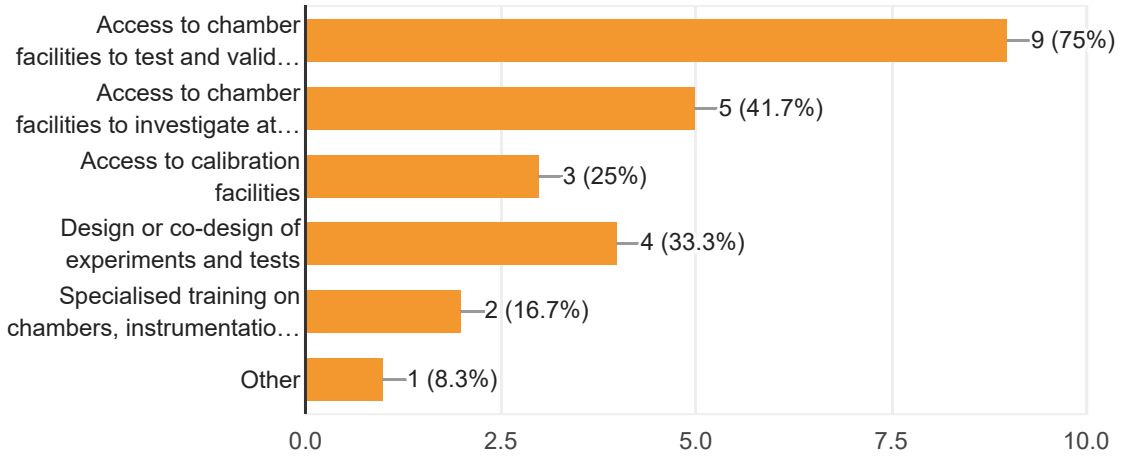
If you ticked “Other”, please add further details:

0 responses

No responses yet for this question.

Which of the following services did EUROCHAMP-2020 provide for your company?

12 responses



Were there any services that EUROCHAMP-2020 could not provide for your company?

5 responses

No

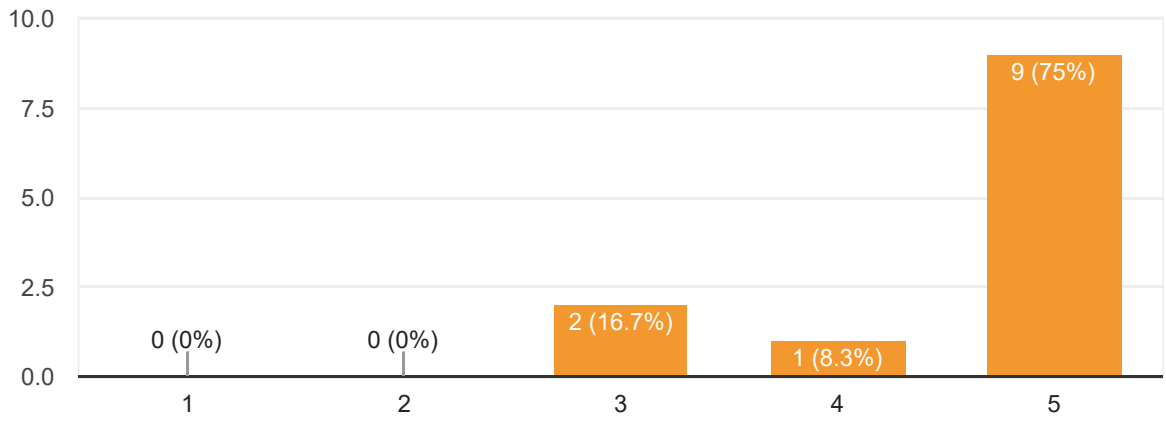
Fast data analysis

no

No. We got everything we wanted and more.

How would you rate your overall experience of working with your EUROCHAMP-2020 partner?

12 responses



Has the collaboration with EUROCHAMP-2020 resulted in tangible benefits for your company? Please explain your answer.

10 responses

Allowed us to pinpoint some flaws in our device

yes, after collaborative development we brought product to the market

Company publicity and awareness

we are still working on the experiments, we expect to have good results in the future that will help us in developing a testing procedure for new reformulated fuels

Access to unique facilities helped the company to highlight its innovative attitude and stress its role in the market and with collaborators

Development of new equipment

Generation of know-how on the interaction of atmospheric free radicals with human hair

Has the collaboration with a EUROCHAMP-2020 partner stimulated further research and collaborations? Please explain your answer.

9 responses

Currently studying ways to correct the flaws and improve the air cleaning device

yes, we started and think about further developments

The various partners are contributing to the answers and conclusions of understanding the impacts the human society has on the environment locally as well as globally. We have to continue this work to fully understand the impacts and form the best suitable countermeasures thereof.

we are looking for a long-term collaboration with Univiersity of Eastern Finland

We are working on perspective projects with possible wider collaborations

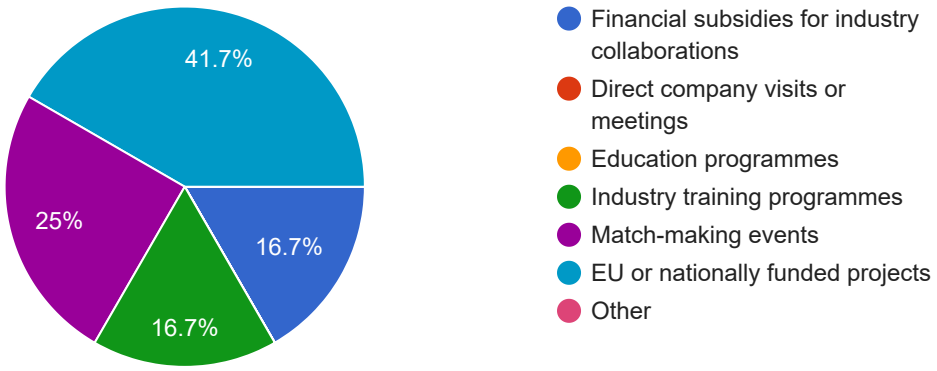
currently on-hold

Yes; through increased contacts.

Yes, the reuslt were communicated and received positively by potential customers

Which of following measures would be beneficial for developing collaborations between the atmospheric simulation chamber community and industry?

12 responses



If you ticked “Other”, please add further details:

0 responses

No responses yet for this question.

What would be the most efficient ways to promote new initiatives related to public-private collaborations? (Participation in fairs and events, email circulars, social media, etc.). Please leave us your suggestions.

10 responses

Social media presence and participation in events would be pivotal

fairs, workshops

Networking events, in person conferences

individuation of potential industrial problems and direct contact with interessed companies

Promotion of facilities network on social media and organization of dissemination events at local scale

email newsletter

lower bureaucratic hurdles to industry cooperation (both sides!)

Fairs and events would be useful.

Please add any other comments, feedback and suggestions for improvement of our services.

2 responses

Extremely useful facility for instrumentation development and benchmarking studies

Our experience was exceptional. And that is before taking into account the brief reprieve from covid-related restrictions.