



**Euro-CASE Working Group: Engagement with Early-Career Professionals
Recommendations for Euro-CASE Board**

1. Executive Summary

This paper presents a summary of evidence and findings from the project led by a Euro-CASE Working Group to explore national academies' engagement with early-career professionals (ECPs).

The initial findings substantiate that this is a topic of high interest and importance. It is a common priority for many national academies and becoming more so than ten years ago. The importance of engaging with ECPs is often indicated in academy statements of different sorts. Many academies have found innovative ways to do so and have created unique and beneficial offerings. The engagement is however evidently on the operational level and in a rather unstructured manner. Engaging ECPs in the governance of the academy is rare.

The survey and the interviews have also revealed that national academies operate in very diverse ecosystems, among various other professional engineering associations, and connections to research and industrial networks. Hence there is no "one-size-fits-all" standard format for European academies to enhance engagement with ECPs. Based on the evidence, the Working Group presents the following points which can be considered as best practices, guidelines and tips for individual academies wishing to enhance their engagement with ECPs. Following these recommendations would most likely result in a more strategic approach:

- a. Consider the value of engaging with ECPs**
- b. Map out the existing engagement network for ECPs on a national level**
- c. Develop a robust value proposition**
- d. Consider different levels of engagement**
- e. Engage with other academies who are experienced in specific aspects of ECP engagement**

In parallel with recommendations for national academies to enhance their engagement with ECPs, the Working Group sets out some additional recommendations concerning actions at Euro-CASE level. The Euro-CASE Board is invited to consider and discuss potential ways forward based on these recommendations:

- f. Develop a structured mechanism of interaction for Euro-CASE member academies on particular aspects of ECP engagement**
- g. Stimulate exchange between Euro-CASE academies to learn from each other**
- h. Consider the value of developing relations with the Young Academy of Europe (YAE)**
- i. Consider the value of a pan-European network to connect young engineers, industrialists and academics**

2. Background and Project Approach

At its October 2019 meeting the Euro-CASE Board launched the initiative to develop a report for Euro-CASE member academies to share information on their experiences of engagement with young professional engineers. Euro-CASE had recognized the importance of engaging directly with ECPs, who are the emerging experts and leaders within science, technology and engineering. Many academies already actively engage with ECPs, including Euro-CASE itself through the EU-US Frontiers of



Engineering program. Euro-CASE therefore saw this as a rich area for learning and exchange between academies, in parallel with its initiative to enhance communication within its network.

This paper presents a summary of evidence and findings from the project, led by a Euro-CASE Working Group, to explore national academies' engagement with ECPs. The working definition of "young professionals" was originally framed by the Euro-CASE Executive Committee to encompass young engineers who have completed their education and are in the early stages of the professional working career, either within research or within industry. The Working Group then refined the definition of early-career professionals (ECPs) for the purposes of this project as:

"individuals who are in the early years of their professional working career, ranging from PhD students to those with approximately 0-15 years' of full working experience within research, industry or enterprise"

The project gathered evidence via a survey of 17 Euro-CASE member academies, who each gratefully shared extensive information about their perspectives and experiences of engaging with ECPs. The survey has provided deep quantitative and qualitative data demonstrating the reasons identified to why academies wish to engage with ECPs, the extent to which academies aim to enhance their engagement, and their practical experiences of delivering activities and initiatives designed specifically to engage this demographic.

Five interviews with ECPs were also conducted, which broadly explored ECPs' experiences of engaging with their respective national academy. The interviewees had varying levels of engagement with the academy ranging from membership of a Young Academy to no interaction at all. While the sample size was small, the interviews reveal valuable perspectives on different aspects of ECP engagement. The approach taken also provides a methodology that could be applied for a larger cohort of ECPs, or applied directly by national academies wishing to better understand the perspectives of ECPs within their country.

The Working Group, which has been chaired by the Royal Academy of Engineering (UK) and includes representation from seven other Euro-CASE member academies, also shared its own perspectives, analysed the data and formed a set of recommendations which are presented in this paper¹. Some ideas from the Working Group about inter-academy learning are also expressed.

3. Findings from Survey and Interviews

Headline statistics from the survey of 17 academies:

- 82% (14/17) said that engagement with ECPs is a priority for their academy.
- 82% (14/17) are prioritising engagement with ECPs more than they did 10 years ago.
- 82% (14/17) said they wish to expand/enhance their engagement with ECPs.
- Only three academies rated their current engagement with ECPs as better than moderate.
- 41% (7/17) said they face barriers/challenges that prevent them from expanding/enhancing their engagement.
- 65% (11/17) said their academy's mission, strategy or business plan includes specific statements about engaging with ECPs.

¹ The Euro-CASE Working Group led by RAEng was set up in May 2020 and had online meetings on June 2, and September 3, 2020. The Group conducted a survey of Euro-CASE member academies in August 2020 (see Appendix 1) and held an initial series of informal interviews with ECPs from around Europe (Appendix 2). This resulting draft recommendations paper has been written in view of a presentation at the Board of Directors meeting in November 2020.



- Only three academies said that ECPs are regularly represented on their boards, committees and working groups (PAS; OAW; KVAB).
- 71% (12/17) of academies already offer activities/initiatives designed primarily to benefit ECPs.
- Nine academies said that their country has an external "young academy" for ECPs, but only two of the nine work with them regularly (acatech and CoFA) and only one reported having strategic relations (CoFA).
- Five academies stated they operate their own internal "young academy" model (OAW; PAS; CoFA; KVAB; ARB from 2022).

Fundamentally, the findings of the project so far substantiate the Euro-CASE Board's position that this **is a topic of high interest and importance**. A large majority of academies surveyed said that they are prioritising engagement with ECPs, and more so than they were ten years ago. A large majority also said that they wish to expand/enhance their engagement with ECPs. While the survey has revealed that **there is a large and diverse range of approaches and initiatives being** employed by Euro-CASE member academies to engage ECPs, it is notable that only two academies rated their current engagement with ECPs as better than moderate. **Clearly, there is significant scope for inter-academy learning and a strong case for a more systematic approach to facilitating exchange.**

Generally, the consensus on why academies wish to engage with ECPs is that they see ECPs as **important for the academy's future**, that it is important to give ECPs **a voice in the academy**, and that **the academy can offer benefit to ECPs themselves**. ECPs are recognised for bringing modern and dynamic input, a network of young talents but also recognition and outreach for the academy itself. One could state that the ultimate aim should be for the academies to have more impact in society and governance by involving ECPs. It was pointed out that the engagement of ECPs could be used to support important issues like diversity and equality, in a strategic manner to shape the future. The benefits of initiatives evidently vary according to the degree and intensity of the ECP activities.

It is true that almost all academies were not designed to engage with ECPs, but it is also true that several academies have found innovative ways to do so and **have created unique and beneficial offerings** for ECPs. Nowadays quite many of the academies have **statements about engaging with ECPs**, in their academy's mission, strategy or business plan. The engagement is however evidently **on the operational level and in a rather unstructured manner**, and only two academies said that ECPs are regularly represented on their boards, committees and working groups. The ECPs are clearly in general **not engaged in the governance of the academy**. In one instance, KVAB formed a Young Academy in 2012. After recognising that the central academy was missing out on opportunity for useful contributions, KVAB nowadays facilitates the input from the Young Academy members into its central boards and committees. This is however an exception. The findings also indicate that the alignment between the central academy and cohorts of ECPs, often is lacking. **Mechanisms for alignment** would be beneficial, such as common fora's.

Whereas the central academies differ to some extent, some being more focused towards science and some more towards applied research and engineering, the approaches with young academies focus exclusively or mainly on universities or have **limited attention on technological sciences and industrial careers**. Four academies state that they have their own internal "young academy" model, with a fifth launching one in 2022.

Despite engagement with the ECPs being a priority for almost all academies, and becoming more so the last decade, **few have a clear strategy to enhance engagement**. However, **most academies do offer activities/initiatives designed primarily to benefit ECPs**. Nine national academies indicated that their country has an external young academy (i.e. external to the national academy) but only one of the nine (CoFA) reported that there is a strategic relationship between the two bodies.

In terms of the wide range of national academy activities/initiatives being employed to engage ECPs, these **vary in scale, intensity and duration**. The survey shows 4 different formats: sporadic and occasional activities for and with ECPs; more lasting engagements with ECPs; building ECP



communities within or next to the academy; and positioning the ECP communities at the core of the academy activities and governance. Keeping this scale in mind may provide a useful guide for academies wishing to incrementally enhance their engagement.

Grant funding programs, events and networking opportunities are commonplace. Several academies also offer training and mentoring, prizes and cash awards, or appoint ECPs to paid positions to work on projects. There are also some unique and innovative initiatives offered, like career-mobility support, hackathons, data camps, start-up support for entrepreneurs, and educational outreach (working with ECPs to engage other young people). **The activities often seem to have evolved without much connection and are scattered within the academies, rather than there being a comprehensive engagement strategy.**

The unique position of most Euro-CASE academies, in **bridging academy and industry**, is identified as offering value to ECPs. Also, the **interdisciplinary character** and the role in addressing grand engineering and societal challenges is considered important. The main reasons indicated why ECPs want to engage with academies include professional insight and development, networking and developing skills in science communication. However, the initial interviews conducted with ECPs, show that ECPs themselves may be **less aware of the value** (or may simply not recognise any) in engaging with national academies, hence there is **a need to create and then promote a clear “value proposition”** for engaging with academies, since it's not always easy to see what the specific outcomes are. The ECPs also may fail to see any obvious route to structured engagement, at least at the point of their current career stage, perceiving that academies are closed communities of senior researchers and professionals. This shows **a lack of structured offerings** and **difficulties in maintaining engagement** when an activity, a program etc. is finished. Many academies identified shared challenges, including **limited ability to communicate effectively** with ECPs, **lack of relevance** and **limitations of funding, staff support and resources**, which has become a more acute issue in 2020. Lack of a formal membership structure is also mentioned as an obstacle. However, ECPs themselves don't seem to expect a formal membership, and it is therefore likely that the lack of structured offerings and a clear value proposition are bigger obstacles. Lack of time for ECPs is mentioned but the findings do not indicate it to be a severe obstacle overall. Formal barriers to collaborate with ECPs or young academies do not seem to exist.

The findings suggest that **the national context must be considered** when developing engagement with ECPs, i.e. by national academies within their own national environment. In some countries, most notably the UK, an extensive professional network for ECPs already exists as provided for by a web of Professional Engineering Institutions (“PEIs”, which provide certification to engineers in the UK). Nine academies also said that their country has an external “young academy” for ECPs that represents the same/similar professional disciplines covered by their academy. Clearly it is important that a national academy offering is **a unique and complementary addition to what ECPs already obtain via existing networks**, and while understanding how to link with these networks and young academies and complement them the best way is of course of great interest, this is not taken into account in this study. In the example of PEI networks in the UK, these bodies offer certification, professional development and networking benefits to ECPs, but within narrow professional disciplines. The national academy's unique offering can therefore be to bring together broader groups of engineers and others for inter-disciplinary exchange, learning and inspiration.

As for the long-term flourishing of ECP communities within a senior academy there are a few good practices:

(1) in order to keep the ECP community “young”, there should be a temporary membership of the ECP community of say five years, without commitment to enter automatically the senior academy, and in order to keep the continuity, a yearly renewal of 1/5 of the membership can be planned



(2) new ECP members are selected by the ECP community itself, i.e. without patronage of the senior academy, on the basis of their commitment to work on relevant topics like the grand challenges of engineering, science communication, science and innovation policy, diversity and interdisciplinarity,

(3) the senior academy and the ECP community can as well work together when they have a joint interest in a theme and independently when they have different themes,

(4) governance of the ECP community is handled autonomously by the ECP community, but in view of the temporary membership of the ECP community a limited staff support and working budget should be provided by the senior academy.

4. Full Recommendations

As an outcome of the exercise to date, the Working Group presents a number of recommendations as follows. These are organised into two groups: guidelines and tips for national academies wishing to enhance their engagement with ECPs, and recommendations for Euro-CASE regarding possible next steps. The paper is not intended for informing broader audiences about these issues. In case Euro-CASE has such an ambition, it would have to set up a follow-up action to prepare a public statement on the importance of ECP engagement for national academies and umbrella academies like Euro-CASE.

The topic of ECP engagement is definitely considered by many European engineering or general academies as an important one. The survey and the interviews have revealed that national academies operate in very diverse ecosystems, among professional engineering associations and connections to research and industrial networks. Hence this Working Group cannot and should not formulate a one-size-fits-all standard format for the ECP initiatives for all European academies. Rather it can produce recommendations and highlight good practices that can be shared, and it is up to the individual national academies to make the appropriate plans. If there is enough interest, one approach could be a twinning programme, where one academy that seeks to enhance ECP engagement in a specific area is matched with another that has particularly relevant experience.

Recommendations for national academies

Evidence gathered via a survey of Euro-CASE member academies and a series of interviews with ECPs revealed extensive information about the experiences of European academies of engineering, science and technology. Based on the information, the Working Group presents the following points which can be considered as best practices, guidelines and tips for individual academies wishing to enhance their engagement with ECPs:

- a. **Consider the value of engaging with ECPs:** Engagement with ECPs is understood to offer a range of benefits, both to the academy and to ECPs themselves.
- b. **Map out the existing engagement network for ECPs:** In order to develop a robust value proposition for ECP engagement, it is crucial to understand which bodies, networks and offerings already exist for ECPs within each national domain, and the benefits that ECPs already receive
- c. **Develop a robust value proposition:** the national academy's offering to ECPs should be unique, valuable and complementary to what is already offered by other bodies and networks. Typically, national academies are uniquely placed to bring together diverse, multi-disciplinary cohorts to focus on grand challenges and major societal issues, although it should be acknowledged that each national landscape is different, so there is no one-size fits all solution.
- d. **Consider different levels of engagement:** there are different levels to aspire towards, depending on the academy's current progress, capacity and individual objectives. This paper identifies four levels of engagement.



- e. **Engage with other academies who are experienced in specific aspects of ECP engagement:** the survey revealed a wide range of experiences, lessons and good practices that could benefit other national academies. This paper presents an indication of where knowledge exists (see Chart 1 below), and national academies are encouraged to make contact with each other for learning and exchange.

Where an academy seeks to mobilise an ECP community outside or next to the senior academy, one can partner with communities of young engineers within professional engineering associations around challenge-based forums or within other parts of the ecosystem. These groups can then become best placed to communicate with the outside world on the academy's role in societal issues. As well selected young promising engineers the members of this ECP community will lead progress during their careers and will utilize their digital savviness.

Altogether, following these recommendations would result in a more strategic approach than what is often the case today, according to the findings.

Recommendations for Euro-CASE

In parallel with recommendations for national academies to enhance their engagement with ECPs, the Working Group sets out some additional recommendations concerning actions at Euro-CASE level. The Euro-CASE Board is invited to consider and discuss potential ways forward based on these recommendations:

- f. **Develop a structured mechanism for Euro-CASE member academies on particular aspects of ECP engagement:** develop the report, raising awareness of where specific knowledge lies within individual academies and facilitating effective communication and exchange amongst the community. As a first step, see Chart 1 for an indication of where knowledge exists in the Euro-CASE community.
- g. **Stimulate exchange between Euro-CASE academies to learn from each other:** continue the inter-academy exchange on other topics, in similar ways.

The mechanism for scientific advice for the EU government through the SAPEA project by the united forces of about 100 academies and their unions of academies (ALLEA, EASAC, Euro-CASE, FEAM), Academia Europaea and the Young Academy of Europe has proven to be very valuable and productive. A stronger ECP engineering contribution should be considered. It can also stimulate Euro-CASE to involve ECP in its activities and its role in SAPEA.

- h. **Consider the value of developing relations with the Young Academy of Europe (YAE):** YAE is a pan-European initiative of outstanding young scientists for networking, advocacy, scientific exchange, and science policy. Euro-CASE could consider whether there is a value working closer with YAE.
- i. **Consider the value of a pan-European network to connect young engineers, industrialists and academics:** a clear gap exists for a network that engages early-career engineers and industrialists as well as academics and scientists. Euro-CASE could consider whether there is value in creating a new multi-disciplinary network that forges links with existing European and national bodies for ECPs, to bring an even more diverse range of professionals together. Such a network could also bring new insights and issues to the SAPEA framework.

Chart 1: Euro-CASE Community Knowledge on ECP Engagement

The following chart provides an indication of where knowledge lies on specific aspects of ECP engagement within the Euro-CASE community of national academies, based on responses to the survey. This includes a selection of novel and successful initiatives that national academies identified as having the most impact, plus indications of where knowledge lies on more general topics.



Euro-CASE

This is not a comprehensive record and it should be noted that many other initiatives led by national academies are in operation. This resource can be considered as a first step in developing a more systematic approach to enabling knowledge sharing between member academies, in line with Recommendations f & g.



1. High impact activities (indicated by each academy as being their most impactful)		
Initiative	Impact	Academy
acaLAB	Brings together young talents	acatech
Mentoring Programme – older scientists acted as mentors for younger scientists who had recently received their first project funding	Inspiration for ECPs and raised profile of the academy among ECPs	CoFA
The Young Scientist Award	Increases ECPs' professional recognition	HATZ
Leadership Programme -	Assembles a broad range of expertise and builds strong networks in fields with the potential to be strategically important for Sweden's future industrial development. objective is to offer the next generation of R&D leaders an opportunity to develop in their role by providing a forum for fresh ideas on how research, development and innovation activities can be run. Gives ECPs a voice in the national academy.	IVA
Establishing a national Young Academy within the organisation	For ECPs: networking and connections, realising nationwide impact on importance topics, promotion of viewpoints. For academies: closer involvement of ECPs in academy activities, greater diversity of shaping academy messages, increased relevance	KVAB
Social Media Demonstration – working with a young YouTube influencer to promote an academy report	High engagement levels on social media	NATF
Research Fellowships	Improving the overall health of the engineering research sector, contributes to a recruitment base, drives the link between research and industry in high impact areas that may not be 'en vogue'	RAEng
Prizes	Increases professional recognition for ECPs	RAI



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2. Experience on general aspects of ECP engagement	
Topic	Academies with experience
Setting up and operating a Young Academy (inside the national academy structure)	OAW; PAS; CoFA; KVAB
Regular engagement with an external national Young Academy	CoFA; acatech
Linking with international-level academies for ECPs	PAS; KVAB
Involving ECPs on national academy boards, committees, working groups	PAS, OAW, IVA
Social media communication with ECPs	NATF
Setting up associate membership for ECPs	ASTR