

European Leadership through Disruptive Technologies: Future and Emerging Technologies towards 2030

European Parliament, Brussels (Room: A5E-2)

7th March 2018, 18.00-20.00

Dermot Diamond (Co-Chair, FETAG)

A video of the speech is available at:

<https://www.pscp.tv/w/1eaJbpBMWMRKX>



Some of the event's keynote participants. From left to right: Dermot Diamond (SFI INSIGHT Centre), Daniela Corda (Italian National Research Council), Patrizia Toia (Member of the European Parliament), Annika Thies (Helmholtz Association of German Research Centres), Jerzy Langer (Polish Academy of Science), Thomas Skordas (Director DG CONNECT), Maria Chiara Carrozza (Sant'Anna School of Advanced Studies in Pisa), Paul Lukowicz (German Research Center for Artificial Intelligence DFKI GmbH), Olivier Frey (InSphero AG).

What is FETAG?

FETAG is panel of experienced researchers drawn from across the member states that together constitute a broad expertise resource for the programme, and provide advice on issues such as structuring of measures, priority topic selection (Proactive and Flagship), evaluation mechanisms, ways to further enhance socio-economic impact, predicting trends and opportunities, as well as enhancing the educational and training experiences of emerging young researchers, ensuring the principles of 'responsible research' are employed, and dissemination/public engagement, ways to strengthen the international dimension of, and industry (MNCs AND SMEs) participation in, research (open agenda) and so on.

FETAG meets regularly with Thomas & the FET secretariat team in an open forum of discussion and debate. The minutes and key strategic documents developed by FETAG are publicly accessible via the FETAG website .

Unique Characteristics of FET Funding Measures

FET manages three main funding measures which together span from small scale to the largest instrument under the EU H2020 programme, and possibly the largest world-wide. These are;

FET OPEN

- Unrestricted in terms of project topics, any idea can be submitted
- Bottom up; small scale (€3million, 4 years)
- Typically involves 3-4 partners. Unconventional groupings occur because its open nature
- Projects must be high risk – but with a coherent plan, risk management
- Hugely popular and oversubscribed with a correspondingly low success rate. The low success rate is an issue that has been debated at FETAG meetings and number of initiatives have been taken that will address this issue and significantly improve the success rate through to 2020.

FET PROACTIVE

- Larger in scale than OPEN - €5-6 Million; 4-6 partners; specific topics
- Topics informed by outcomes of OPEN; through discussion with FETAG, and through open solicitations for input.

Active topics for Forthcoming Calls through to 2020;

- **Artificial organs, tissues, cells and sub-cellular structures.**
- **Time**

- **Living technologies**
- **Socially interactive technologies**
- **Disruptive micro-energy and storage technologies**
- **Topological matter**

FET FLAGSHIPS

Another example of creative thinking within the FET programme. Largest research instrument within the H2020 programme;

€1 Billion budget co-funded 50% by the member states; 10-year effort; Many 100's of researchers, multiple groups from across Europe and beyond; very significant industry involvement; focused on big ideas, challenges –game changing in nature – not incremental or evolutionary – revolutionary impact is required.

Three are already established:

- (1) Human Brain;**
- (2) Graphene;**
- (3) Quantum Technologies.**

It is important to appreciate that FET-Flagships are driven by fundamental scientific challenges.

Three Additional Flagships are planned for the next wave:

Topics

- (1) ICT and Connected Society***
- (2) Health and the Life Sciences***
- (3) Energy, Environment and Climate change***

The FET programme therefore is inherently

OPEN: It embraces the broadest scope of project topics and ideas imaginable

Flexible: it embraces projects that can be small and speculative or very large scale.

Balanced: It seeks to stimulate new scientific and technological thinking from the ground up (Open, Proactive), while also developing innovative top-down initiatives (Flagships) that provide a coherent large-scale effort in order to bring research outcomes more effectively towards impact.

Cohesive: It embraces European cohesion as a fundamental principle – all FET projects must involve cooperation across Member States and Associated States.

Towards 2030: What is FET's Role in Delivering IMPACT from Research and Innovation Investment

Research and Impact

There is a disconnect (particularly so in Europe) between basic research focused on fundamental scientific questions and translating the outcomes of this research into social and economic impact. Most scientific research comes to impact through a circuitous route; and can take a long time (often 10-20 years or even more). Scientists trying to explain this in public fora appear to be evasive – apparently unable to answer apparently simple, direct questions. But this is truly an honest reflection of the complexity of the research and innovation process.

Mission Oriented Research (Lamy, Mazzucato)

The mission oriented research advocated in these reports at first glance appears to be similar to Flagships with similarities in terms of scale, duration breadth of effort, and involvement of multiple players, including citizens, communities, industry (large and small), and public and semi-private entities.

I believe this model is necessary and **MUST** be adopted – the sentiment is correct and timely. We must create more effective ways to pilot and test emerging technologies in real-use scenarios at scale e.g. through small-to-medium scale procurement competitions; and an increased focus on involvement of communities and citizens.

However, the drive for these mission-based initiatives comes from a **SOCIETAL CHALLENGE**, and the emphasis is very much on **IMPACT** within the project timescale. For these initiatives to deliver impact, the research **MUST BE WELL ADVANCED** in terms of maturity, and significantly de-risked. Project plans may well be more like an applied industrial project with straight lines from initiation through milestones to deliverables.

This is a critically important part of overall innovation pathway which is poorly developed in Europe. It has to happen, and if organised effectively, it could have a dramatic positive impact on the translation of research outcomes through to practical implementation.

However, this should not replace the current FET Flagship model which can be regarded as a mirror image effort – driven by a fundamental scientific challenge – designed to deliver a focused, large scale effort to advance fundamental knowledge; with the impact focused on scientific breakthroughs

that will ultimately emerge. But with these initiatives, the line between research effort, and impact is unpredictable. Impact is more focused on scientific advances - the societal impact could arise in areas that were not considered at the project commencement, through opportunities that did not exist at the time of project drafting. Furthermore, the timescale between (basic) research initiation and impact can be long – commonly 10+ years, and often much longer. Therefore (at least according to this perspective), in contrast to ‘Missions’, Flagships require a much more flexible and dynamic organisational structure, that could involve significant changes in players as the research progresses, and opportunities emerge.

The challenge for the ‘FET Towards 2030’ agenda is to attempt to reconcile and connect these mirror image efforts – one top down and the other bottom up in terms of driving challenges. I believe there is a need for both models, working in parallel – each informed by the other. The really big challenge then is to have an effective connection strategy, that drastically improves the pathway from basic research through to societal and economic impact. If we can deliver this agenda, I further believe that by 2030 we will have transformed research organisation, and created the means to make research real and appreciated by the citizen, through clear demonstrations of research having hugely positive impact on society. Europe can lead this transformation of research organisation and support, by retaining the FET portfolio of measures as a coherent package into FP9.

Perhaps then the social and economic benefits of our research investment will be realised first – in Europe!!