

# INVEST IN THE CLEAN ENERGY FUTURE WE WANT

## TEN RECOMMENDATIONS TO ACCELERATE COMPETITIVE CLEAN ENERGY INNOVATION WITH 'HORIZON EUROPE'

■ **THOMAS PELLERIN-CARLIN**  
Head of the Jacques Delors Energy Centre, Jacques Delors Institute

Doubt is spreading over Europe's capacity to build a better future for all. Many parents fear their children will be worse off than they are. Four months ahead of the European elections, the European Union (EU) has a chance to challenge this mind-set by setting a new horizon for its Research and Innovation (R&I) policy.

The European Commission, Council and Parliament are indeed negotiating 'Horizon Europe', the next EU Framework Programme for R&I<sup>1</sup>. This comes at a time when Europe is engaged in the **energy transition: a radical change of the way we heat, power and transport ourselves**, to ensure better lives on a clean planet.

The EU and European States ended the year 2018 with the [EU Long Term Strategy](#) and the [international climate negotiations](#) at COP24. They made the right promises; they now need to walk the talk. Horizon Europe is key in that regard, because **there will be no energy transition without transformative innovation**<sup>2</sup>.

This policy brief aims to inform the negotiations and implementation of Horizon Europe, to **help the European Union invest in the clean energy future we want**. It thus makes **ten recommendations** to 1) strengthen EU **R&I Missions**, 2) focus the **European Innovation Council** on providing patient capital to innovators, and 3) **invest sufficient public funding** into these promising innovations.

### 1. Energy innovation matters for European competitiveness

European competitiveness in the 21<sup>st</sup> century is driven by Europeans' capacity to innovate<sup>3,4</sup>.

A well designed EU R&I policy is thus critical to ensure European prosperity in the face of rising competition from others countries. In the clean energy sectors, Europe leads on wind power, but China already won the solar

panel race<sup>5</sup>, and China and the US are currently leading in electric vehicles and batteries.

If Europe loses the global clean energy race, Asian and American companies will eventually take over what will be left of the European energy and transport industry.

Yet, **Europe has all the right cards to win the game**. It has excellent scientists, brilliant innovators, well-trained workers, dynamic cities, and enough capital to perform the necessary investment. To pave the way for Europe's industrial renaissance, Europeans only need to play their cards in an efficient and timely manner, starting by understanding why clean energy innovation is particular (cf. Section 2) and how to design Horizon Europe accordingly (cf. Section 3).

### 2. Clean energy innovation differs from innovation in other sectors.

#### 2.1 Technological energy innovations combine both a technology and a market risk

Energy innovation requires targeted public support because it is riskier<sup>6</sup>. To understand this, let us focus on clean energy technological innovation and compare it with medical and software innovation.<sup>7</sup> All are affected by a 'technology risk' (i.e. will my technology work?), and by a 'market risk' (i.e. will my innovation find its customers?), but in a different manner.

#### Medical innovation is characterised by a high technology risk and a low market risk.

For instance, developing a cure to AIDS entails a high technology risk (i.e. will this cure actually work?). It however has a low market risk as a cure to AIDS will find customers.

#### Software innovation is characterised by a low technology risk and a high market risk.

For instance, the technology needed to build

The author would like to thank Greg Arrowsmith, Abrial Gilbert d'Halluin, Pascal Lamy, Emilie Magdalinski, Sébastien Maillard, Julia Reinaud, Pierre Serkine, and Philippe Tulkens for their valuable comments on this policy-brief.

a mobile phone app is straightforward. This new app may however never find its market due to irrelevance or competition.

**Clean energy technological innovation combines both a high technology risk and a high market risk.** For instance, a company developing a way to produce electricity with the power of the waves faces a high technology risk: will it be able to cheaply produce electricity? It also faces a high market risk: will it find a market if wind/solar power become even more competitive?

## 2.2 The European Union and European States adopted energy targets that cannot be reached without more clean energy innovation.

Clean energy innovation is driven first and foremost by a political endeavour: ensure that Europe and the world avoid catastrophic climate change. The EU just adopted the **'Clean Energy for all Europeans'** package that, amongst other things, almost doubles the level of ambition of deployment of renewables and energy efficiency in the 2020 decade – that starts in 344 days. Each EU State furthermore ratified the Paris Agreement and thus committed to build a **carbon-neutral economy**. That is to say that in around 30 years, humans should not emit a gram of CO<sub>2</sub> more than they can capture.

Let us be clear, **none of that will happen without deep and transformative innovation.**

## 3. Horizon Europe – ten recommendations to make it work for clean energy innovation and competitiveness

With 'Horizon Europe' the European Commission already proposes to (A) mobilise through R&I Missions, (B) set-up a European Innovation Council and (C) increase the EU budget for innovation. This is a leap in the right direction. European States and the European Parliament should further build on it.

### 3.1 Strengthen EU R&I Missions to mobilise researchers, innovators, cities and citizens.

Innovation is not done in a vacuum. It requires a direction. R&I Missions are a new tool to create a better future for Europeans by giving

an explicit direction to innovation<sup>8</sup>.

Missions can represent the 'missing link' between a policy objective (e.g. Sustainable Development Goals) and concrete R&I projects supported by the EU (e.g. clean mobility solutions for cities). Missions should be the tool to develop multiple bottom-up solutions (e.g. housing renovation, urban planning, smart grids, etc.) with targeted outcomes based on milestones<sup>9</sup>. To ensure the alignment between EU, national, local, public and private actors, Missions should furthermore be cross-disciplinary, cross-sector<sup>10,11</sup> and cross-actor.

To make the best of EU R&I Missions in the context of the energy transition, this brief suggests to:

- Recommendation n°1: co-elaborate, with like-minded EU territories and cities, an **EU R&I Mission aiming at making 100 EU territories/cities carbon-neutral by 2030**. This would demonstrate that the energy transition could swiftly become a reality across Europe.
- Recommendation n°2: **ensure proper citizen involvement in Horizon Europe's Strategic Planning** and in the elaboration of Missions. The European Commission proposed steps in that direction, which some National Governments now oppose. This risks having Brussels' inter-institutional power play watering-down the ambition of Missions.
- Recommendation n°3: **create**, after the European elections, **the position of a "European Commission Vice-President for Innovation"** that will be able to promote a crosscutting innovation agenda, including by improving the policy framework to accelerate the deployment of clean energy innovation. He/she should work hand-in-hand with relevant actors inside<sup>12</sup> and outside the Commission to ensure the success of EU R&I Missions.

### 3.2 Focus the European Innovation Council on its main potential: providing patient and risk-tolerant capital to promising innovators.

Europe needs to support innovators throughout the entire innovation value chain:

from lab to market, from an innovative idea to a market-ready reality. As already well analysed by the [Druid Collective](#), innovation is risky, return on investment takes time, and the **private sector is unwilling to take that amount of risk, especially in the energy sector.**

In this context, the European Commission proposes the “European Innovation Council” (EIC): a tool managed by the European Commission with high-quality staff actively managing important amounts of EU funding (around 15 Billion euros). The EIC should help innovators find their path (EIC pathfinder) and accelerate the deployment of their best ideas (EIC accelerator<sup>13</sup>).

An important design feature of the EIC is its time horizon. If it were to be set too close to market practices (3-5 years), it would risk to overlap with private venture capital. To meet the needs of breakthrough innovators, the EIC should provide patient and risk-tolerant capital with a time horizon that is likely to be in the realms of 10-15 years.

It furthermore remains unclear at which stage of the life of a company the EIC can have the most impact. As a Brussels-based centralised organisation, it seems unlikely that the EIC would be the best tool to support start-ups at an early stage in a more efficient manner than existing decentralised EU entities (e.g. [European Institute of Innovation and Technology](#)) and national/regional innovation initiatives (e.g. [Danish Innovation Fund](#)). It may however become the critical tool to scale-up a start-up after its early stage.

This policy-brief thus suggests to:

- Recommendation n°4: focus the EIC on **providing patient and risk-tolerant capital** to those innovations that need time (e.g. 10-15 years) to flourish. The EU needs to act in the 2020s to create the next generation of carbon-neutral technologies and innovations that have to be market-ready by 2030/2040 to meet the market demand from world countries that aim for [a carbon-neutral economy by 2050/2060](#).
- Recommendation n°5: focus on **transforming high-potential early-stage clean**

**energy companies into successful European Champions.** Without this crucially needed focus, Europe’s best innovators will continue to relocate to the US or Asia.

- Recommendation n°6: **create a specific ‘energy, climate and mobility’ window** within the EIC. This would send a positive signal to clean energy innovators that are often frustrated by the attention given to digital innovation.
- Recommendation n°7: ensure that national initiatives, especially the [recent Franco-German ones](#), complement the EIC. To do so, National Governments may give the EIC a seat at the board of all their innovation funds. To the greatest possible extent, civil servants should **keep complexity inside**. This would help innovators focus their time in delivering the best innovation, rather than spending too much time trying to understand where to look for public support.

### 3.3 Increase the budget to ensure that promising innovations are not lost because of lack of funding.

Budget matters. EU researchers and innovators are currently drastically under-funded. This leads to having even excellent R&I projects being turned down by the EU because of lack of funding. As a token prize, the European Commission gives to some projects a ‘[Seal of Excellence](#)’ in the (often vain) hope that someone else will provide support. In other words, today as Europeans, we collectively decide not to finance excellent projects that would better our lives and boost our economy.

The EU must therefore do more. This is why the “[Lamy Report](#)” called for “doubling the overall budget” for Horizon Europe, while the European Commission suggests an increase to 94Bn€ for the 2021-2027 period, and now the European Parliament calls for 120Bn€. This is also why this brief calls to:

- Recommendation n°8: **ensure that not a single cent of EU money gets misspent by going to fossil fuels.** In the face of rising challenges to the EU and democracy, European decision makers cannot claim to champion clean energy if they continue to finance dirty energy projects.

- Recommendation n°9: **increase the Horizon Europe budget to 120Bn€**. Furthermore, to ensure the EU leads by example, at least 35% of Horizon Europe investments should go to climate change-related R&I, as the European Commission currently proposes.
- Recommendation n°10: build synergies. Even with 120Bn€, Horizon Europe will only represent around 10% of public R&I spending in Europe, and around 4% of all public and private R&I spending in Europe. **The European Commission should thus build more synergies** with other EU funding tools<sup>14</sup>, national schemes, and transparently cooperate with private actors, as it already does with Breakthrough Energy Ventures.<sup>15</sup>

## Conclusion

European policy makers talk big about developing new business opportunities, fighting climate change, and creating quality jobs. Horizon Europe gives them the opportunity to walk the talk: invest EU money where it is most important to help European businesses become the competitive providers of goods, services and quality jobs of the energy transition.

This is key to protect Europeans from climate change and to boost the competitiveness of European companies. This is also **key to ensure the political sustainability of the European energy transition**. A socially-fair and democratically-supported energy transition needs Horizon Europe to create jobs, improve the quality of life and demonstrate that the EU is building a better future for all Europeans.

**Acting now would send a positive message to European citizens who will vote in 23-26 May 2019.**

1. Philipp Staender, "Research policy: guide to the negotiations on Horizon Europe", Jacques Delors Institute-Berlin, July 2018
2. Innovation is here understood as the action of introducing something valuable and new to a given organisation. This can be an innovation in terms of new business model, behaviour, technology, values, social norms, etc.
3. Thomas Pellerin-Carlin and Pierre Serkine, "From Distraction to Action – towards a bold Energy Union Innovation Strategy", Policy Paper No. 167, Jacques Delors Institute, June 2016.
4. Donald Kuratko, The entrepreneurial imperative of the 21st century, Business Horizons, 2009
5. Industrial Innovation for Competitiveness (i24c), Scaling-up innovation in the energy union, May 2016.
6. Clean energy innovation is even riskier whenever it requires a broader socio-technical system changes. F. Geels and al., 'Reducing energy demand through low carbon innovation : a socio-technical transitions perspective and thirteen research debates', Energy Research & Social Science 40, 2018.
7. Gaddy Benjamin, Sivaram Varun, O'Sullivan Francis, "Venture Capital and Cleantech: the wrong model for clean energy innovation", July 2016
8. Marianna Mazzucato, Mission-oriented research & innovation in the European Union, European Commission, February 2018.
9. The US Department of Energy 'SunShot Initiative' is often presented as an example of smart management of energy innovation.
10. The Council of the European Union's January 10 draft position on R&I Missions include areas such as: "Adaptation to Climate Change, Cancer, Healthy Oceans and Natural Water, Carbon-Neutral and Smart Cities, Soil Health for Sustainable food".
11. For an example of an already cross-sector EU-funded research project, see [ENABLE.EU](#).
12. Including DG Competition to see how to adapt EU competition law for a swift deployment of the innovations needed to reach the EU energy-climate policy objectives.
13. The European Commission proposes the Accelerator to "provide financial support to not yet 'bankable' or investors-attractive innovators and companies that have the ambition to develop and deploy in EU and international markets their breakthrough innovations and to scale up rapidly".
14. The Jacques Delors Institute (Paris & Berlin), and the European Policy Centre, are currently working on this specific issue as part of a report for the European Parliament. Questions on this can be directed to my colleague [Eulalia Rubio](#).
15. See for instance [my 17 October 2018 tweet](#) on Bill Gates and the European Commission teaming-up to finance clean energy innovation.

Managing Editor: Sébastien Maillard

- The document may be reproduced in part or in full on the dual condition that its meaning is not distorted and that the source is mentioned
- The views expressed are those of the author(s) and do not necessarily reflect those of the publisher
- The Jacques Delors Institute cannot be held responsible for the use which any third party may make of the document
- Original version
- © Jacques Delors Institute