

11. Action 11: An ERA for green energy transformation

1.1. Purpose of the Action and expected outcomes

This Action aims at setting and implementing strategic priorities that deliver on the ERA agenda, by prioritising investments in R&I towards the green transition, improving access to excellence, translating R&I results into the economy and deepening policies that promote the free circulation of knowledge.

Accelerating research and innovation and improving collaboration between private and public R&I in the Member States with a view to early market introduction of clean technology solutions is crucial to achieving the ambitious targets set by the European Commission to become climate neutral by 2050 and to reduce greenhouse gas emissions by at least 55% by 2030 compared to 1990.

Part of Action 11 is foreseen to contribute to the achievement of three key outcomes, as outlined in the European Research Area Policy Agenda 2022-2024:¹

- Policy approach for a cooperation framework on R&I driven safe and sustainable low-carbon energy technologies;
- Development of a green hydrogen R&I ERA pilot action, while ensuring consistency with other related initiatives and without prejudice to the relevance of a broader hydrogen R&I policy approach;
- ERA4FutureWork: a policy approach (at local, regional, national and EU levels) to address research and development (R&D) funding for the Future of Work.

Action 11 is part of the priority area 'Taking up together the challenges posed by the twin green and digital transition and increasing society's participation in the ERA' and linked with Actions 10-14 focussing on the twin green and digital transition and the challenges for society and R&I linked to them. The action is particularly closely linked to Action 12 of accelerating the green/digital transition of Europe's key industrial ecosystem.

1.2. Implementation of the Action

Based on the Council Conclusions of 1 December 2020, the Commission and interested Member States kicked off the process for a green hydrogen R&I ERA pilot action. The '**Agenda Process on the ERA pilot on Green Hydrogen**' was built around three thematic workshops on transport and infrastructure, market stimulation and production throughout 2021 to identify urgent research and innovation questions for Green Hydrogen competitiveness. The results of the agenda process were summarised in a strategic research and innovation agenda (SRIA) on green hydrogen – the major outcome of the R&I initiative within the ERA – and were published on 18 March 2022.

In the Commission Staff Working Document (2022) '**Building a European Research Area for clean hydrogen – the role of EU research and innovation investments to deliver on the EU's Hydrogen Strategy**'² the European Commission details how it will jointly with the Clean Hydrogen Joint Undertaking actively promote and support activities to ensure implementing the ERA Pilot on green hydrogen.

The Temporary Working Group (TWG) on hydrogen was set up in 2023 to implement the Strategic Research and Innovation Agenda (SRIA) of the European Research Area (ERA) pilot on green hydrogen and coordinate the work on hydrogen. It will be supported by a Horizon Europe Coordination and Support Action.

The **European Strategic Energy Technology Plan** (SET Plan) aims to accelerating the deployment of clean energy-technologies. It provides a common vision, goals and coordination for accelerating the development and deployment of efficient and cost-competitive low-carbon energy technologies. The SET Plan was established in 2007 and since the creation of the Energy Union, it became one of the main instruments of the Energy Union's 5th pillar on research, innovation, and competitiveness. However, since the last SET Plan update in 2015, the EU

¹ European Commission (2021), European Research Area Policy Agenda – Overview of actions for the period 2022-2024.

² https://research-and-innovation.ec.europa.eu/system/files/2022-01/ec_rtd_swd-era-clean-hydrogen.pdf

energy policy agenda has considerably changed and ERA Action 11 underlines the need for a revision, which is ongoing at the time this report is written. A Commission Communication on the SET Plan and a SET Plan Conference³ are envisaged for autumn 2023 to communicate the changes to the public.

The revision of the SET-Plan aims at redirecting the SET Plan' scope and objectives to have R&I on energy together with the Member States. Furthermore, it aims at better supporting the European Green Deal, REPowerEU, ERA policy and the Green Deal Industrial Plan, and thus accelerating the deployment of renewable energy, including clean energy. Connecting the activities of Member States and the Commission will be essential to make the EU less dependent on energy imports and to improve the sustainable energy value chain, through research and deployment activities, This includes the Fit for 55 packages, the 2050 decarbonization target, the REPowerEU initiative, as well as the ERA Policy Agenda. Continued support for long-term research on new clean energy sources will be ensured.

One sub-activity of Action 11 proposes a pathway for future collaboration between policy makers, researchers, and stakeholders through a new action (**ERA4FutureWork**), addressing current technological, political and societal changes that impact the future of work. R&I attention should be directed towards these changes to facilitate citizen-friendly outcomes. Within this sub-action, workshops are being organised, of which two have been held already in 2023 on the green transition and working life and on the digital transition and working life.

National policy examples

In various EU Member States there are policies or programmes within which governments support the clean energy start-up policy area in order to contribute to the EU's long-term strategy of achieving net-zero emissions by 2050 and to increase renewable energy sources in the EU's energy mix. For instance, in **Germany**, the Start Up Energy Transition programme provides a cash prize, global publicity and stakeholder dialogues for clean energy start-ups from around the world, which have created at least one prototype.

In **Sweden**, the Swedish Energy Agency runs programmes which provide funding for projects to guide energy innovators to the next level of maturity.⁴ According to Eurostat, in 2021, Sweden was the Member State with the highest share of energy from renewable sources.⁵ There are various R&D schemes and programmes⁶ in place that aim at contributing to the ambitious goal to generate 100% of its electricity from renewable energy sources by 2040:

- The Sustainable Wind Energy Expansion program is a small R&D grant scheme to support the technological advancement of the wind energy sector;
- Bio+ program is a broad interdisciplinary R&D program for activities related to the use of biomass and biofuels that was launched in 2021;
- Climate leap is a broad R&D funding program for local and regional emission reduction measures in different sectors, including energy. The program prioritizes the diffusion of new technologies, improved public health and employment. The program includes the improvement of electric vehicle charging infrastructure.

The 2023 OECD STIP Survey provides additional insightful information on the **policy instruments** related to Action 11, which fall mostly into two categories: governance and direct financial support. Collaborative infrastructures account for the remaining policy instrument. The **budget** of the policies related to Action 11 are well spread between smaller and larger budgets, as shown in the figure below. The initiatives with budgets of over EUR 500 million include national strategies such as the German National Hydrogen Strategy⁷ or key

³ <https://setplanevent.presidency.eu/es>

⁴ <https://iea.blob.core.windows.net/assets/c0efd465-a914-4fe6-b3cf-cbbf96a9d8c6/Howgovernmentsupportcleanenergystart-ups.pdf>

⁵ https://ec.europa.eu/eurostat/databrowser/view/NRG_IND_REN/default/table?lang=en&category=nrg.nrg_quant.nrg_quanta.nrg_ind_share

⁶ <https://clean-energy-islands.ec.europa.eu/countries/sweden/legal>

⁷ 'Update of the National Hydrogen Strategy: Turbo for the H2 economy', Ministry website, available at: <https://www.bmbf.de/bmbf/de/forschung/energiewende-und-nachhaltiges-wirtschaften/nationale-wasserstoffstrategie/nationale-wasserstoffstrategie.html>

priorities within the Spanish Strategic Project for Economic Recovery and Transformation, which includes actions focusing on green energy transformations⁸.

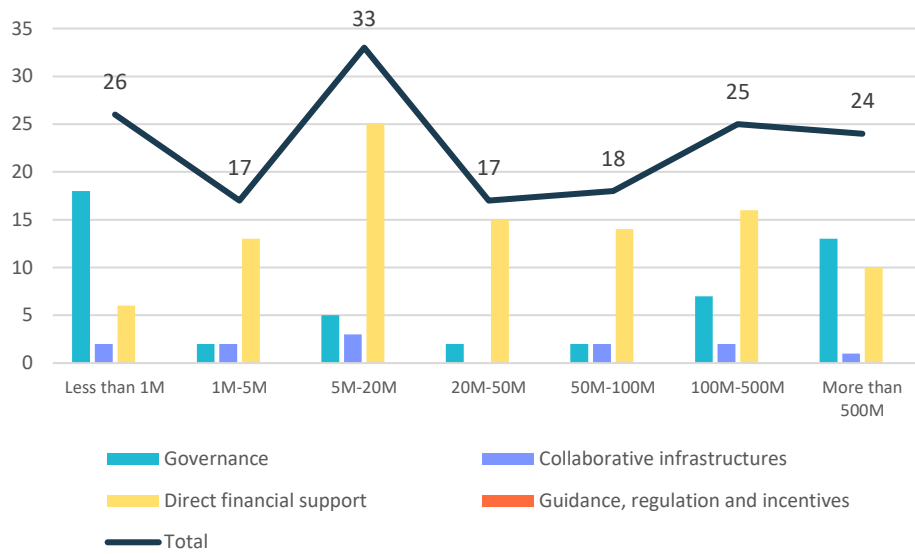


Figure 1: Action 11: Distribution of budget per policy instrument

⁸ 'PERTE of industrial decarbonization', Spanish MRR website, available at: <https://planderecuperacion.gob.es/como-acceder-a-los-fondos/ertes/perte-de-descarbonizacion-industrial>