

SET4BIO: A FRAMEWORK TO ACCELERATE BIOENERGY AND BIOFUELS SOLUTIONS ACROSS EUROPE AND BEYOND

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ABSTRACT: The EU-funded SET4BIO project aims at supporting the implementation of Action 8 of the EU Strategic Energy Technology Plan (SET-Plan) on Bioenergy and Renewable Fuels for sustainable transport. The Horizon 2020 funded coordination and support action SET4BIO has developed a framework with an Implementation Toolbox with the aim of stimulating and supporting the actors and technologies of the sector. The Implementation Toolbox consist of Mapping of National Bioenergy Projects, Financing Opportunities for Bioenergy, Industry Stakeholder Map, Global Outlook, and the Innovation Challenge. These methods and tools have been applied throughout the project which started in early 2020 and ends in August 2023. The methods and tools are described in detail in separate deliverables from the SET4BIO project. There is significant potential to continue applying the methods and tools in the Bioenergy sector and beyond.

Keywords: bioenergy, stakeholders, policies, implementation, financing

1 AIM AND APPROACH USED

The objective of SET4BIO is to support the full execution of the SET-Plan Implementation Plan 8 (IP8) [1]“Bioenergy and Renewable Fuels for Sustainable Transport”; i.e., both for research and innovation lines and large-scale projects, acting as competence centre for the Implementation Working Group (IWG8) and proposing solutions and pathways to overcome the essential barriers associated to IP8.

SET4BIO is designed around a framework consisting of three pillars: activating the stakeholders, mobilizing resources, and stimulating innovation. SET4BIO has developed an implementation toolbox, which is used in the project to put the pillars into action.

2 SCIENTIFIC INNOVATION AND RELEVANCE

The SET4BIO Implementation Toolbox, consisting of different measures to support the implementation of IP8, has been developed by the project partners. It includes: Mapping of National Bioenergy Projects, Financing Opportunities for Bioenergy, Industry Stakeholder Map, Global Outlook, and the Innovation Challenge.

The toolbox is foreseen to be replicable and scalable also to other fields and beyond Europe. Some of the measures of the toolbox are shortly described in Section 3. Some of the tools and experience developed in the SET4BIO such as the Innovation Challenge are currently being used in other EU funded projects and Swedish national projects. The COVID19 pandemic impacted the project significantly and especially the innovation challenge was considerably improved and refined by being forced into an online setting. This led to the possibilities for more participants to attend and levelled out the playing field.

3 RESULTS OR PRELIMINARY RESULTS AND CONCLUSIONS

3.1 Mapping of national bioenergy and biofuels/renewable fuels projects

SET4BIO has mapped the relevant ongoing and recently finished projects at EU and national level, especially for the SET Plan countries engaged in IWG8 as well as at European level [2][3]. The projects covered contribute to the execution of IP8 covering the entire TRL spectrum, from research and development activities up to demonstration and scale-up initiatives. The project database is updated in the project period and presented in an interactive map [4] on the project website and in Figure 1. In total 317 national projects and 39 EU projects have been identified.



Figure 1: Preview of the SET4BIO Map of National Bioenergy Projects.

3.2 Financing opportunities for bioenergy and biofuels/renewable fuels

In SET4BIO both public and private funding opportunities were mapped. For public financing, institutional and competitive funding opportunities were identified in the countries participating in IWG8.

Public institutional funding is usually given to universities and research organisations and covers large thematic areas relevant to the ministries allocating the funds. Competitive funding usually provides a certain research project or infrastructure with a short-term financing. In most countries, the funds' budgets are allocated by the government or ministries and distributed through various funding agencies according to their current programmes.

A relevant challenge found in the research is that the countries do not finance the activities uniformly, neither record the expenditures according to the definitions and boundaries given in the SET-Plan. While competitive funding is available in the studied countries for the IP8 activities, the relevant research funding programmes might not cover the entire IP8 scope, and at the same time, other activities not relevant to IP8 can be included in the same funding schemes.

SET4BIO has also developed an innovative methodology to categorise financial instruments to support project developers in identifying the most suitable ones to foster the development and deployment of their project in the area of bioenergy and alternative fuels [5]. The relevant financial instruments are classified according to:

- Types of financing (grants, equity, and/or loan);
- Stage of development of a project (TRL-Technology Readiness Level);
- Funding range (amount needed by the project developer).

An interactive tool [6] has been developed basing on the research results (Figure 2).

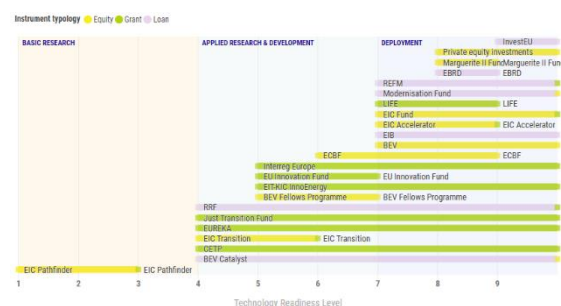


Figure 2: Preview of the Interactive Map of Financing Opportunities for Bioenergy.

3.3 Global Outlook

SET4BIO has identified the platforms and initiatives in the field of IP8, analysed their actions and targets, and benchmarked them against those of SET-Plan Action 8.

The purpose was to create understanding of different platforms in terms of their members and stakeholders, aim and targets, implementation and governance structures, projects and programmes, key outputs, geographical coverage, dialog level (policy/industry/research), and financing. In addition, the target was to gain best practices

to support the implementation of IP8 and identify collaboration opportunities for SET-Plan Action 8 stakeholders. Altogether 20 platforms and initiatives were identified and reviewed in the field of renewable fuels and bioenergy. In addition, 9 platforms in the field of clean hydrogen were covered.

The analysis shows that different platforms cover well different sectors (i.e. policy makers, NGOs, industry and research), and perform different actions, e.g., knowledge sharing, policy recommendations and research and innovation agendas, R&D&D schemes, and technology deployment.

3.4 Innovation Challenge

The SET4BIO Innovation Challenge (Figure 3) has been developed and mobilised to support the creation of innovations that stimulate increased production and use of bioenergy and renewable fuels. Thus, contributing to the implementation of the EU Green Deal vision.

The main purpose with innovation contests that are organised over time (i.e. an Innovation Challenge) is to stimulate the development of mature concepts and prototypes beyond ideas (Hjalmarsson et al. 2017), and therefore they constitute a special case of contests and competitions in open innovation. In general, such contests aim to catalyze the process to develop an outcome that could range from just an idea or a design sketch to a product or service. A key feature of an Innovation Challenge is regardless of aim that the outcome at least is materialized as a prototype or concept. This is in order to assess its viability in terms of novelty, business or scalability. In order to reach such maturity an innovation contest must be organized over time and not as a specific event (e.g. as a Hackathon).

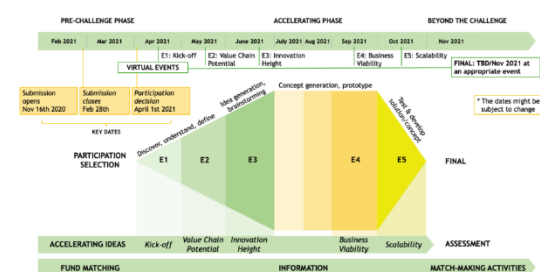


Figure 3: The timeline of the SET4BIO Innovation Challenge process.

Many different labels are used for denoting innovation contests, e.g., innovation competition, innovation tournament, idea jam, design contest and category prize. SET4BIO proposes three contest schemes to catalyze innovations throughout the TRL scale. These are:

- InnovationJam: a scheme to rapidly source and stimulate innovative concepts (TRL1-3);
- InnovationChallenge: a scheme to accelerate innovative concepts to prototypes (TRL3-5);
- InnovationPressureTest: a scheme to check the relevance and reliability of the evolving technology - from prototype to solution (TRL4-7).

An account of the design and preparation of the SET4BIO Innovation Challenge 2021, from early development and design to the launch of engaging

participating teams, is provided in two dedicated public reports [8, 9]. A description of the actual challenge is provided in a separate report [10].

4 CONCLUSIONS

The SET4BIO approach with the framework to activate stakeholder, mobilize resources and stimulate innovation has significant potential for continuation in the bioenergy sector and beyond. A structured approach with methods based on solid scientific background was applied to stimulate the progress in the sector. Monitoring activities carried out also highlighted many areas of potential improvement and synergies between EUMember States (primarily IWG8 Member Countries) and the EU funded projects and programmes.

In order to drive innovation and stimulate the innovation in the bioenergy sector, stakeholders need to be active. It is essential also to bring new actors in and share knowledge and experiences. One way to structure innovation is to use the innovation contest approach. In SET4BIO three different types of innovation contest schemes were proposed along the TRL scale.

The tools developed in SET4BIO such as Interactive Maps of Financing Opportunities, stakeholder maps and innovation challenge schemes are available for use in a wide range of sectors and will continue to serve as a solid basis for further development of the bioenergy sector.

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7 LOGO SPACE

