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Energy Systems Evaluation



SETIS
Information For Decision-making

Review of the SET- Plan Implementation Mechanisms for the period 2010 - 2012

Introduction

In the context of the ongoing discussions for enhancing and strengthening the SET-Plan in Horizon 2020, the review of its implementation for the period 2010-2012 was agreed on the December 3, 2012 meeting of the Sherpas of the European Community Steering Group on Strategic Energy Technologies. This was later confirmed by the Members of the Steering Group in their meeting of February 6, 2013.

The review would focus on: (i) the terms of reference of the Steering Group, aiming to reinforce its role, (ii) the function of SETIS, to enable the better monitoring and progress review, and, (iii) the SET-Plan implementation mechanisms, i.e. the 6 European Industrial Initiatives (EIIs), the Fuel Cell and Hydrogen Joint Undertaking (FCH JU) and the European Energy Research Alliance (EERA).

This Note describes the review process, its findings and recommendations, exclusively with regard to the SET-Plan implementation mechanisms. The outcome of the reviews of SETIS and of the terms of reference of the Steering Group will be presented in subsequent Notes.

Scope of the review of the EIIs, FCH JU and EERA

The review of the SET-Plan implementation mechanisms was performed by JRC/SETIS, upon request of the Steering Group. It was designed to address the following dimensions:

- **The appropriateness of implementation mechanisms:** adequacy of format of EII Teams, representation of stakeholders, interactions with other research and innovation mechanisms.
- **Effectiveness of implementation:** suitability of implementation plans, effectiveness of process that defines priorities and funding needs, commitment of stakeholders.
- **Delivery and impact:** output of EU, national and joint projects contributing to implementation plans and their contributions to the key performance indicators (KPIs) of the implementation plans.

It should be noted that the latter dimension – delivery and impact – could only be preliminarily evaluated given the fact that the launch of the EIIs took place in June and November 2010.

Methodology and Process

The review was guided by a questionnaire designed and distributed by SETIS to the EII teams¹, the EERA Secretariat and the Programme Office of the FCH JU on January 3 (see Annex I). The questionnaire covered the following areas:

- **Assessment of the operation of the EII Team:** number, frequency and participation in the meetings of the EII Team, relevance of the composition of the EII Team, operation of the EII Team (secretariat, working groups, agenda, etc.), interaction with the EERA and KICs, and lessons-learned from the operation of the EII Team.
- **Assessment of the effectiveness and efficiency of the implementation plan 2010 - 2012:** relevance of the duration, vision, scope and priorities of the implementation plan, use of the implementation plans for defining calls and projects under FP7, at national level and/or jointly.
- **Review of execution of the implementation plans 2010 – 2012:** List of projects (co-) funded by the Commission, Member States, or jointly, contributing to the implementation plan, total budget (national and EU) for the reporting period, achievements during the period versus the adopted KPIs, international cooperation.

Informal discussion hearings, sort of interviews, were organized later in January between each EII team, the FCH JU, the EERA and SETIS, during which, their preliminary feedback to the questionnaire was discussed.

These discussions primarily, but not exclusively, addressed issues such as: role of the European Technology Platforms (ETPs), engagement of the industry and involvement of Member States, consenting priorities in the implementation plans and their effect on the work programme/calls under FP7 and joint actions with Member States, interactions with EERA, synergies among EIIs, matching Member States' priorities and funding streams, choices for financing implementation, monitoring progress and knowledge sharing, and international cooperation.

The review in general and the hearings in particular were mainly designed for the EIIs; and they were adjusted to meet the specificities of EERA and of the FCH JU. The review of EERA took into account the EERA joint programme reviews, and in particular the KPIs already defined by EERA, and focused more on aspects related to resources and management, work plans and links with the EIIs; whereas, for the FCH JU, there was more emphasis on alignment with national programmes, the overall link with the SET-Plan and the priority-setting process.

Timeline

The following timeline of the review process was agreed with the Sherpa Group and implemented by SETIS:

¹ Specifically to their coordinators, project officers from DG ENER and DG RTD.

- January 3 – January 28, 2013: Distribution of the SETIS questionnaire – first draft inputs by EERA, FCH JU and the EIIs.
- January 30 – February 1, 2013: Hearings, organized by SETIS, with the EIIs, FCH JU and EERA, based on input provided to SETIS through the questionnaires.
- February 11, 2013: Submission to SETIS of final responses to the questionnaires.
- March 22, 2013: Presentation of the preliminary SET-Plan review findings to a forum of representatives from the EIIs, FCH JU and EERA, by SETIS
- April 11, 2013: Presentation of the SET-Plan review report to the Sherpas of the Steering Group by SETIS
- May 6-7, 2013: Presentation of the SET-Plan review report to the Steering Group and the SET-Plan Conference by SETIS.

Summary of inputs per implementing mechanism

The review framework emphasized on the lessons learned from the implementation of the SET-Plan, as the EU's technology pillar of its energy and climate change policies. The focus was on what has worked and can be even bettered, and on what has not worked as expected and can be improved. It took into account the specificities of the implementation mechanisms reviewed, but it never meant to benchmark practices between the entities reviewed. Therefore, the inputs collected during the process and summarized below should be considered in this context: albeit the perception that the implementation of the SET-Plan is somewhat lagging according to the expectations of many stakeholders, much has been achieved but much more can be attained.

It should be also noted that the EERA and the FCH JU were primarily reviewed in their role as contributors interacting with the EIIs, rather than strictly speaking on their own; both these mechanisms have recently completed their own internal reviews. For the EERA the various joint programmes were examined but not with the intention to provide specific suggestions to each.

The cooperation between SETIS and the coordinating teams of implementation mechanisms has been very good throughout the review process.

Positive attributes	Attributes that could be further improved
European Wind Initiative (EWI)	
<ul style="list-style-type: none"> • Strong involvement of the Technology Platform • Impact of the implementation plan on the development of the FP7 work programme calls and the NER300 programme • Mobilisation of Member States for the development of an ERA-Net + proposal, 	<ul style="list-style-type: none"> • Key Member State is not engaged • Limited direct involvement of industry, other than through the ETP • Missed opportunities between Member States for co-developing RD&D infrastructures (e.g. testing centres) • The implementation plan did not fully consider the ongoing market realities for

<p>notwithstanding on resources rather than technology piloting</p> <ul style="list-style-type: none"> • Preliminary link with EIGI (via an MoU!) • Developing link with the EERA Joint Programme 	<p>the sector</p> <ul style="list-style-type: none"> • A call of the FP7 work programme was pursued outside the IP priorities
<p>Solar European Industrial Initiative (SEII)</p>	
<ul style="list-style-type: none"> • Well-structured and organised EII team (informal TOR) • Strong involvement of the relevant industrial associations • Impact of the implementation plan on the development of the FP7 work programme calls 	<ul style="list-style-type: none"> • The EII comprises two sectors (photovoltaics and concentrated solar power) with vastly different needs and priorities • Limited direct involvement of industry • The photovoltaics roadmap is of questionable validity given the recent technology and market developments • The priorities of the implementation plans do not take into account the recent market developments (for PV, in particular) nor reflect the long term strategy of the sectors (CSP, in particular) • Weak link with EERA • There is no link with EIGI
<p>European Industrial Bioenergy Initiative (EIBI)</p>	
<ul style="list-style-type: none"> • Well-structured and organised EII team (informal TOR) • Strong direct involvement of the industry and the technology platform • Clear focus of the implementation plan on advanced biofuels • Mobilisation of Member States for the development of an ERA-Net + proposal on demonstration • Impact of the implementation plan on the development of the FP7 work programme calls and on the NER300 	<ul style="list-style-type: none"> • Sustained dispersion of the implementation plan activities to a large portfolio of technology pathways • Coverage of the heat and power sector despite the focus of the initiative on fuels • Key Member States with resource potential are not engaged • Policy and regulatory uncertainty • Weak link with EERA

<p>programme</p> <ul style="list-style-type: none"> • Development of the '<i>FlightPath</i>' initiative (links however need to be strengthened) 	
European Electricity Grids Initiative (EEGI)	
<ul style="list-style-type: none"> • Well-structured and organised EII team, working effectively with many groups, despite the induced complexity • Team supported by an EU co-funded Coordination Action; has dedicated meetings with Member States, albeit their involvement needs strengthening as well as this with regulators • Thorough mapping of existing projects and ongoing actions (through the JRC) • The implementation plan focuses on planning and systems integration through large scale demonstration 	<ul style="list-style-type: none"> • Given the central role of the electricity grids theme, several groupings and initiatives, including the EIGI, that exist at European level need to be better coordinated • Weak or non-existent links with other EIIs • Weak links with the EERA Joint Programme • Limited engagement by the ICT sector and OEMs • The implementation plan activities should better balance transmission and distribution issues and also address key technology component and manufacturing issues
European Sustainable Nuclear Industrial Initiative (ESNII)	
<ul style="list-style-type: none"> • Well-structured and organised EII team • Strong link with the EERA Joint Programme • Re-focused implementation plan through prioritisation with clear criteria • Thorough mapping of existing projects and ongoing actions • Established international cooperation 	<ul style="list-style-type: none"> • Limited direct participation of Member States, at least of those with nuclear clearly in their energy mix strategy • Weak industry financial commitment, especially in the later phases of the roadmap • A long term roadmap without near term impact
Carbon Capture and Storage European Industrial Initiative (CCS EII)	
<ul style="list-style-type: none"> • Strong involvement of the industry and the technology platform • Development of monitoring and 	<ul style="list-style-type: none"> • Limited active involvement of the Member States

<p>knowledge sharing processes</p> <ul style="list-style-type: none"> • Impact of the implementation plan on the development of the FP7 work programme calls 	<ul style="list-style-type: none"> • Very broad implementation plan • Policy and regulatory uncertainty • Weak link with the EERA Joint programme
Fuel Cells and Hydrogen Joint Undertaking (FCH JU)	
<ul style="list-style-type: none"> • Institutionalised programme organisation • Industry-led • Significant portion of funding implementation through SMEs • Institutionalised progress review • Preliminary international cooperation 	<ul style="list-style-type: none"> • Weak links with national initiatives and programmes • Weak overall link with the SET-Plan, developing now, and other research and innovation mechanisms • Weak link with the EERA Joint Programme (need for it in the context of the Research Grouping?) • Agility of revising the MAIP to address emerging EU priorities • Based on a business model addressing several application areas and a mixture of basic – applied research – development & demonstration that may be reconsidered
European Energy Research Alliance (EERA)	
<ul style="list-style-type: none"> • Consolidation of key national research capacities (e.g. shared use of wind R&D facilities) • Steps on positioning EERA in the research and innovation chain and creating an enduring structure to support thematic continuity • Established review process • Currently working on a business model for H2020 	<ul style="list-style-type: none"> • Weak working links with most EIIs • Not full alignment with the implementation plans of the EIIs – limited dialogue with industry in the context of EIIs • Establishment of many Joint Programmes before any feedback from the operation in practice of the early ones • Low level of self-integration of the resources - 'Virtual' resources for joint programmes • Primary focus of ongoing joint programmes on outreach activities

Funding Facts

The table below discerns the investments in the various SET-Plan Technologies in the periods 2010-2013. The exactness of these figures should be treated with caution as far as the FP7 and the Member State funding are concerned, considering: (a) difficulties with identifying which of the funded projects exactly contribute to implementation plan activities, (b) whether some of the funds were allocated before 2010 and/or are earmarked for allocation in 2013, (c) the non-optimal reporting by Member States on their national programmes and d) contributions by the Member States in matching the FP7 funding are excluded. Notwithstanding it is believed that these figures, to the best of our knowledge, are very indicative of ongoing trends.

SET-Plan Technologies	FP7 Funding M€	EEPR M€	NER300 M€	MSs M€
WIND	130,1	565	273,1	≈ 450
SOLAR – PV	85			>> 200
SOLAR – CSP	83,5		203,2	
CCS	182,8	1000		≈ 1500*
BIOENERGY	221,3		607**	> 450
NUCLEAR FISSION	132,5			357,3
ELECTRICITY GRIDS	141			≈ 360
FCH JU	450			> 350
EERA	1			~ 450

* This figure includes public investment in Norway.

** The total funding was 629,3 M€; however, one of the NER300 funded projects was not in line with the EIBI Implementation Plan

Key Findings

As noted earlier, much has been achieved with the SET-Plan in creating a momentum for 'Europeanising' the energy technology research and innovation to deliver as required for EU's energy and climate policies for 2020 and evermore so for the evolving challenges towards the 2050 horizon. It is based on this recognition, the opportunities that are definitely there, yet to be exploited, and the evolving energy challenges that require a strengthening of the SET-Plan if to transform the European energy system.

This section highlights some selective key findings of the review, upon which recommendations in the following section are proposed. These findings purposely do not dwell on such issues as financing of the SET-Plan and the associated needs for increased pooling of EU funds, coherence and coordination of decision-making process in the European energy and research innovation landscape as well as available instruments for implementation, especially for flagship and large scale demo projects.

EIIs even at this embryonic stage are proven unique mechanisms for industrial-driven research and innovation. The Teams that are leading and coordinating these however, do not fully meet their foreseen mission and key objectives. They mostly miss a balanced and representative group of industries and often of Member States with clear commitment to strategic planning, investment and coordinated implementation. Supported by the European Technology Platforms, whose contributions have been valuable, they have demonstrated capacity to prioritizing and planning of actions. However, it is their decision making and ability to putting into 'operation' the implementation plans that are limited.

Given the limited portfolio of instruments for implementation and lacking novel financial engineering options for demos of European value, the activities of the initiatives have been primarily financed through FP7, but also through the European Energy Recovery Programme (EERPR) and recently the NER300 mechanism. As such, the teams, constrained by the financing possibilities to meeting the ambition of their Technology Roadmaps, do consume exceedingly considerable effort to consenting and proposing priorities for the FP7 work programme calls. In a few occasions together with Member States the ERA-Net + mechanism is successfully pursued; interestingly enough this has been the case also for bioenergy demo plants whereas for wind energy it did not venture further than resource mapping. There is a need for clarity on the level of support and commitment to the SET-Plan from the public and private side, for instance through a multi-annual plan of investments between the Member States and/or with the Union containing different implementation modes from individual to joint efforts including institutional efforts through the EERA. This plan should be matched by solid commitments from the private side.

Although it may seem impractical to have frequent editions of the Roadmaps the recent experiences with the financial crisis, technology and sectoral market developments and the evolving challenges to the European energy system beyond 2020 point to the need for a higher degree of responsiveness to these by the roadmaps. This is more relevant for the implementation plans. Their mutual consistency, clarity and sound endorsement of the commitment to their execution and funding needs to be better addressed within the SET-Plan governance.

The links between EIIs have been limited or superficial at best. Although this may be understood for some technologies, the missing coordination between the electricity grids and the other EIIs is puzzling. This possibly reflects the lack of practical arrangements to foster interaction and collaboration between EIIs that may consolidate the SET Plan priorities at the

energy system level with clear responsibilities from the different SET-Plan mechanisms e.g. the Steering Group, EIIs, EERA etc. On the positive side one may argue that at least they are not competing with each other.

The FCH JU on the other hand was just recently 'included' in the SET-Plan operations. Accounting for its institutionalized structure and ring-fenced budget, its rapid integration with the other implementation mechanisms has been challenging.

As for the EERA, the implementation of the Joint Programmes should be sped up as a matter of priority with clear integration of the research capacities committed by its members and a stronger link to industry.

Efforts by SETIS and the EII Teams to monitor the Member States programmes, investments and initiatives in support of energy research and innovation have not been overly successful. Knowledge sharing principles that are necessary to evaluate the progress of implementable actions have not advanced, despite the strongly developing culture of 'Key Performance Indicators' (KPIs) within the EIIs. Measuring the impact of the SET-Plan on the energy policy objectives is absolutely necessary to justify its central role in transforming the European energy system and hence the need for developing and applying a practical and effective reporting system.

Key Recommendations

Organisation and structure of the EII Teams

- The scope and remit of the EII teams should be better defined and agreed upon within the SET-Plan governance structure. This would lead to a more effective implementation process, both for identifying and prioritizing actions and for committing to their execution. The leading role of industry should remain pivotal for the operation of the EIIs, preferably through their direct engagement rather than via an association umbrella. The European Technology Platforms should also maintain their facilitating role, as incubators for ideas to be further developed within the EIIs and catalysts for reaching an early consensus among industrial and other stakeholders. Yet, the roles of the Member States and of the European Commission in the EII decision-making process should be further clarified, aiming for a lean and effective organizational structure. A practical process led by the Steering Group may also be required to ensure consistency, coordination and interaction between the EIIs.
- The active involvement and commitment of the Member States to the operation of the EIIs should be stepped up. The contribution of Member States should include, but not limited to, proactive sharing of information within the EII Team on national strategies, research and innovation programmes, ongoing relevant projects and highlights of their results; defining and endorsing priorities; and committing (at least in principle) to support collaborative initiatives within the scope of the EII.
- The EII Team structures should be complemented with missing 'voices' along the full span of the research and innovation chain. While these 'gaps' are specific to each EII, additional members of the EII Team could come from research (e.g. EERA), innovation (e.g. KiC InnoEnergy), the supply chain, market uptake and regulation. The links and coordination with EERA, in particular, should be strengthened once its role in the overall landscape of technology research and development is identified. This action will ensure that each EII has a full research, innovation and supply chain perspective.

- The EII Teams must be agile and dynamic enough to identify how best to maximize synergies and integrate best with each other so as to ensure that the SET-Plan addresses energy technology from an integrated systemic viewpoint. These attributes will also help the EII Teams to deal with trade-offs between the possible overlapping objectives of various actions within the European energy research and innovation landscape. Guidance on this could be provided by the Commission.

Implementation

- The Steering Group should ensure that the implementation of the SET-Plan has a holistic energy system focus and takes into account cross-cutting issues, which may not be considered by individual EIIs. Hence, the Steering Group should provide specific guidance to the EII Teams for the formulation of their implementation plans, which should primarily aim at cost reductions based on the European vision for the evolution of the energy system and its technologies and the associated European energy technology and innovation strategy; monitor closely EII progress; and, identify areas that should be addressed jointly by more than one EII. These areas could include grid integration, knowledge spillovers, common research infrastructures and socio-economic aspects. This could be practically achieved by: (1) the development by the Steering Group, supported by SETIS with the involvement of all relevant stakeholders, of the SET Plan priorities at energy system level, and, an associated guidance document with key orientations for each EII, (2) the engagement of the Steering Group (or their Sherpas) during the formulation of the EII implementation plans, (3) the annual reporting of EII actions to the Steering Group.
- The implementation of SET-Plan should address all stages along the innovation chain. This is already fully acknowledged, and pursued as such, by the various activities in the European panorama, but uncoordinated. The current EII focus is on prototype developments, pilots and full scale demonstrations of European value, leading to deployment. Whether the stages of technology development closer to the market or with a longer term perspective would be easier to consent for and committing to, it seems to depend on the technology, on the EU added value weight of the activity and the commitment of the private sector to funding.
- The ERA-NET+ funding mechanism, already pursued by the Bioenergy and Wind Initiatives, is deemed as a valuable approach within the current portfolio of funding instruments and should be utilized by other EIIs. The lessons, albeit limited, drawn so far from the formulation of the respective proposals would be very useful for identifying the mechanism's suitability for the various technologies and their aspects thereof and for the improvement of the mechanism itself.
- Joint actions between Member States, using other mechanisms, such as the Berlin model or EUREKA, should be promoted taking into account the specific Member State interests, underpinned by their industrial strategies, their resource potential and the overall vision for the transition of the European energy system, as mentioned above. This would lead to the clustering of efforts in support of specific technological options, with significant benefits to the use of human and financial resources and to spillovers and knowledge diffusion and adoption, and hence to the overall innovation ecosystem.

Delivery & Impact

- The success of SET-Plan lies on the commitment of all stakeholders, industry, the Member States and the European Commission, to carry out the endorsed EII implementation plans. This should entail an increasing alignment of national energy research and innovation policies, the development of joint actions between Member States with a strong industrial participation, and the coordination and integration of EU and national funding.
- The results of the SET-Plan actions should be monitored and analysed regularly so as to provide feedback to the policy- and decision- making process. In particular, SETIS should be tasked to assess in regular intervals, the impact of SET-Plan on the energy policy objectives and on energy research and innovation goals of the Union; and provide the necessary information to the Steering Group for the evaluation of progress by the EIIs and for setting future priorities and targets, thus adjusting the implementation of the SET-Plan to the evolving policy and market conditions.
- The reporting from Member States on national research and innovation priorities, recent initiatives and investments need to be further enhanced and formalised. More specifically, Member States should provide to SETIS on regular intervals, such information, which will be subsequently analysed and fed to the policy- and decision-making process, as described above.

Annex I: Template for the Review of EIIs



Review of the SET Plan European Industrial Initiatives (EIIs) for the period 2010 – 2012

EII:

1. ASSESSMENT OF THE OPERATION OF THE EII TEAM:

- Meetings of the EII Team:

Number of meetings of the EII Team, the frequency and the participation (MSs, Industry representatives), summaries of meetings:

- Relevance of the composition of the EII Team:

Please justify:

- Operation of the EII Team

Describe how the EII Team is organised (secretariat, working groups, set up of the agenda etc.):

- Interaction with the EERA and EIT KICs, as well as with other EII Teams

Describe to what extend the EII Team interacts with other EII Teams, the EERA and the EIT KICs – what are the results of these interactions:

-
- Pros / cons on the operation of the EII Team

Please justify and make suggestions for improvement – note success stories as possible best practices for other EIIs:

2. ASSESSMENT OF THE EFFECTIVENESS AND EFFICIENCY OF THE IMPLEMENTATION PLAN 2010 - 2012:

- Relevance of the duration of the Implementation Plan (3 years)

Please justify:

- Relevance of the vision, scope and priorities of the Implementation Plan

Please justify:

- Use of the Implementation Plan for calls and projects funded under FP7

Please justify:

- Use of the Implementation Plan for calls and projects undertaken at Member State level

Please justify:

- Pros / cons on the effectiveness and efficiency of the Implementation Plan.

Please justify and make suggestions for improvement:

- Validity of the EII 2010-20 Roadmap

Please justify whether or not the Roadmap should be updated:

3. REVIEW OF EXECUTION OF THE IMPLEMENTATION PLAN 2010 – 2012:

Please provide:

- List of projects implemented by EC (e.g. FP7), MSs and jointly between EC and MSs contributing to the Implementation Plan 2010 – 2012
- An estimate of the total RD&D budget (EC and MSs – at least of those MSs participating in the EII Team) allocated for execution of projects and activities addressing the EII technology during the 2010-12 period
- What were the achievements of projects/activities (executed and/or ongoing) during the period versus the Implementation Plan KPIs
- What has been the overall progress of the technology since 2010 given the aforementioned investments and achievements?