D1.1. Overlapping interests

SET Plan Steering Group Meeting

30th April, Carlos Arsuaga (CIRCE)

SMARTSPEND

more and better designed public support for energy technology Research & Innovation

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OBJECTIVES

- Identify overlaps and synergies between technological activities included in IMPLANs
- Identify non-technology issues affecting the realization of IMPLANs
- Provide recommendations to grasp synergies
- Provide suggestions to address non-technical issues

IMPLAN	IMPLAN full title	SET plan key action
1	Photovoltaics	No.1 in Renewables
2	Concentrated Solar Power	
3	Offshore Wind	
4	Ocean Energy	
5	Deep Geothermal	
6	Consumers [IMPLAN not available]	Smart Solutions for Consumers
7	Smart Cities	
8	Energy systems: Increase the resilience and security of the energy system	Smart Resilience and Secure Energy Systems
9	Energy Efficiency Solutions for Buildings	Energy Efficiency in Buildings
10	Continue efforts to make EU industry less energy intensive and more competitive	Energy Efficiency in Industry
11	Become competitive in the global battery sector to drive e-mobility and stationary storage forward	Batteries and e-Mobility
12	Bioenergy and Renewable Fuels for Sustainable Transport	Renewable Fuels and Bioenergy
13	CCS and CCU	CCSU

Technology synergies and overlaps

Methodology

1. Analysis 12 IMPLANs

2. Synergy/overlap between 2 activities

3. New fiche

4. Validation by partner

Technology synergies and overlaps

Fiches

- Relevant IMPLANs
- Common activities
- Description of synergy + recomm.
- Common targets
- TRLs
- Budget
- MS + stakeholders

7) Development of high-temperature heat pumps	
IMPLANs concerned	9. Energy efficiency in buildings 10. Energy efficiency in industry
Common actions	9) 5.2-1 - Cost-efficient, intelligent, flexible heat pumps (also thermally driven) and heat pumps for high temperatures. 10) 3.2 - Heat or cool upgrade from low to high grade (heat pump/ refrigeration).
Description of the synergy	Both activities are aimed at developing a new generation of heat pumps with advanced performance and reduced costs. Activity 9) 5.2-1 has a very wide scope, covering different lines of work (component development, digitalisation, different applications and sizes, etc.); one of these areas –development and deployment of high temperature heat pumps for industrial processes and DHC– is very similar to the overall scope of activity 10) 3.2, which aims at demonstrating heat pumps to make cost-effective use of waste heat with high efficiency. There are some differences on the final temperature achieved (up to 170º in one case and up to 250º in the other) but the application and goals is very similar. Moreover, other areas of activity 9) 5.2-1 (interoperability and controllability) are briefly mentioned in activity 3.2. TRL levels seem rather aligned around the high part of the range (towards demonstration actions), being the budget much bigger for 9) 5.2-1 (over 50 times), which is normal considering how wide that activity is. Coordination between SET-Plan countries (e.g. Austria, Belgium, Switzerland or Italy) and the EC is encouraged when financing these activities and joint calls for funding heat pumps for industrial processes (for various temperature ranges) is suggested, particularly considering that several industrial stakeholders have shown interested and have participated in the elaboration of both activities (Euroheat&Power, COGEN, CEFIC, EUA).
Common targets / Expected results	- Heat Pump Systems: Cost reduction for small and large size heat pumps by 50% (compared to 2015 market price), development of prefabricated, fully-integrated 'plug in and play' hybrid/multisource heat pump systems and integrated compact heating/cooling plants based on modular heat pumps. - Maximising the recovery of industrial excess heat/cold in a cost-efficient manner. - By 2025, develop and demonstrate (to TRL 8) solutions enabling small and large, industries to cost effectively reduce their energy consumption by 5% by cost effectively upgrading excess heat / cold for more valuable application elsewhere in the process.
TRLs	Energy efficiency in buildings: TRL 3 to 9. Energy efficiency in industry: TLR 4 to 8.
Budget	Energy efficiency in buildings: Budget of €230 million. Energy efficiency in industry: Budget of €4 million.
Member States & Stakeholders	Energy efficiency in buildings: Countries: Austria, Belgium, Bulgaria, Switzerland, Cyprus, Czech Republic, France, Ireland, Italy, Latvia, Netherlands, Portugal, Sweden, Turkey. Main stakeholders: Euroheat&Power, EMIRI, ECTP, COGEN Europe, EGEC, EHPA, EUA-EPUE, PU Europe, ETIP RHC, Sintef Energy, REHVA, ESTIF. Energy efficiency in industry: Countries: Austria, Belgium, Switzerland, Germany, Spain, Finland, France, Italy, Netherlands, Norway, Portugal, Sweden, Slovakia, Turkey. Main stakeholders: A.SPIRE, CEFIC, COGEN, Euroheat&Power, EASE, EERA, EGEC, EPPSA, EU Turbines, EUA, EUROFER, ESTEP.
Timeline	Energy efficiency in buildings: 5 years. Energy efficiency in industry: 3 years.

Technology synergies and overlaps

Results (I)

Identified synergy	IMPLANs involved		Identified synergy	IMPLANs involved
1) Building automation systems and modelling	7 9		2) Carbon capture in HIsarna process	10 13
3) Cogeneration of heat and power in hybrid plants using biomass	10 12		4) Combination of thermal energy storage and heat pumps in residential sector	2 9
5) Deep geothermal heat sources in District Heating	5 9		6) Development of decentralised local and regional sustainable energy systems through Living Labs	8 9
7) Development of high-temperature heat pumps	9 10		8) Digital solutions for building and plant management	9 10
9) Drilling techniques and metal extraction processes	5 11		10) Geothermal resources production and use of underground	5 13
11) Guidelines, methods and tools for sustainable buildings, districts, cities and regions	7 8		12) Heat and energy extraction from reservoirs	5 10
13) High temperature thermal storage	2 10		14) Hydrogen production via electrolysis	3 12
15) Integration of local geothermal energy in the energy system	5 8		16) Integration of wave and wind energy production	3 4
17) Integration of wind energy in process industry	3 10		18) PED living labs for the decarbonisation of European cities	7 9
19) Power to hydrogen in wind farms	3 10		20) PV applications in buildings	1 9
21) Standardised batteries for building applications	9 11		22) Thermal energy storage with focus on geothermal energy	2 5

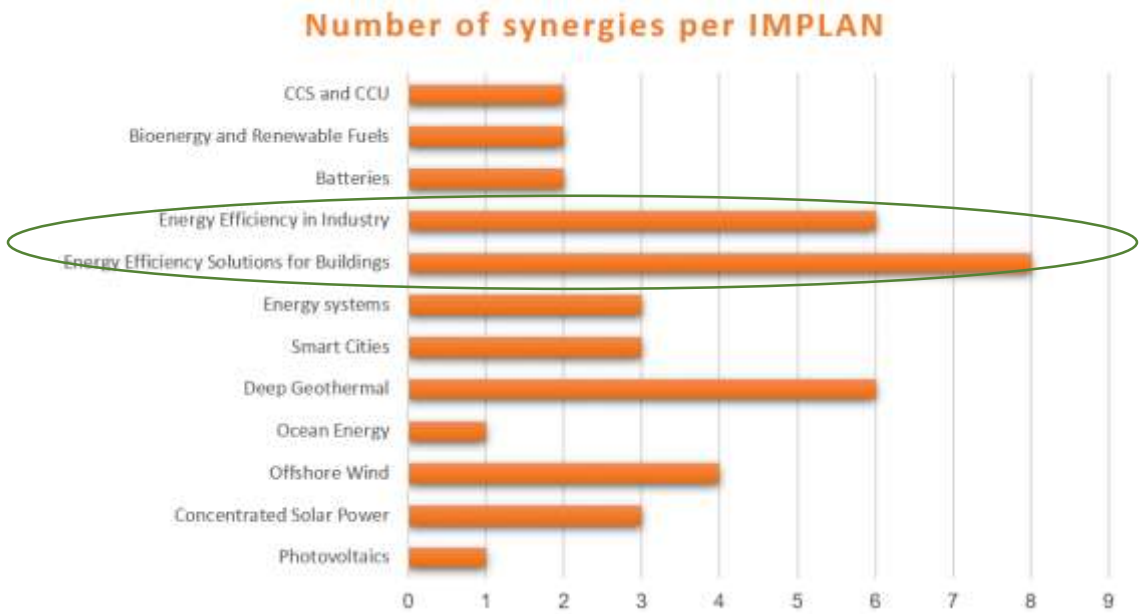


Figure 1. Number of synergies found after IMPLAN analysis.

Technology synergies and overlaps

Results (II)

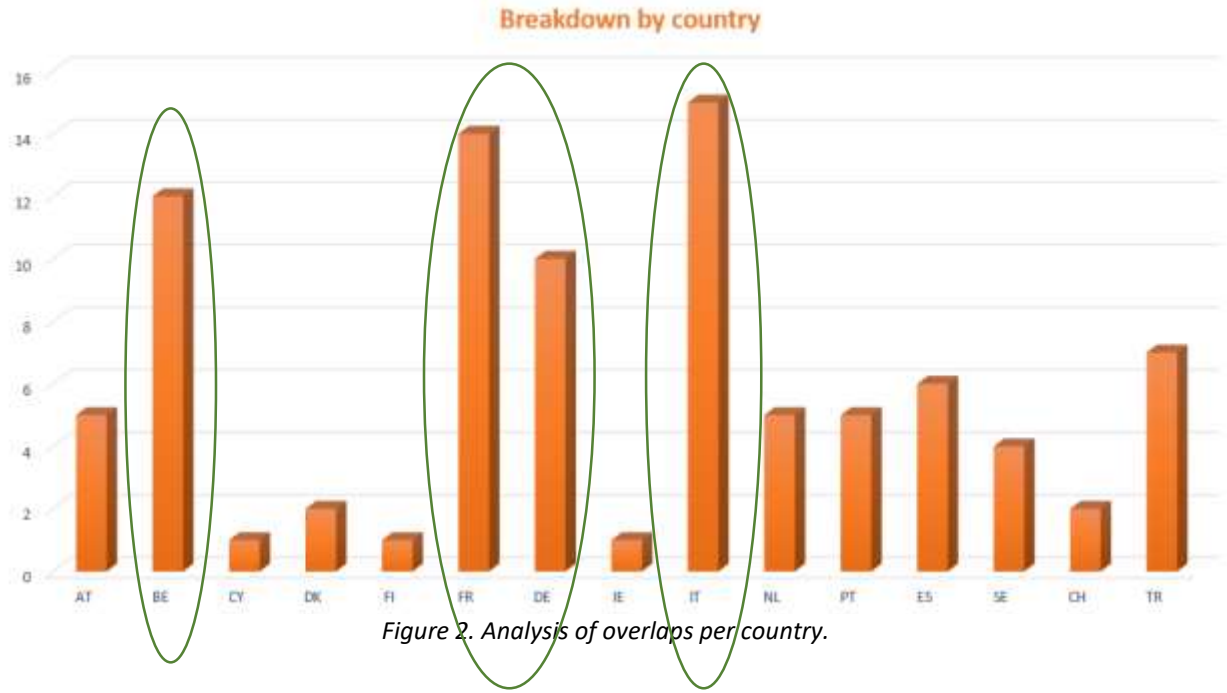


Figure 2. Analysis of overlaps per country.

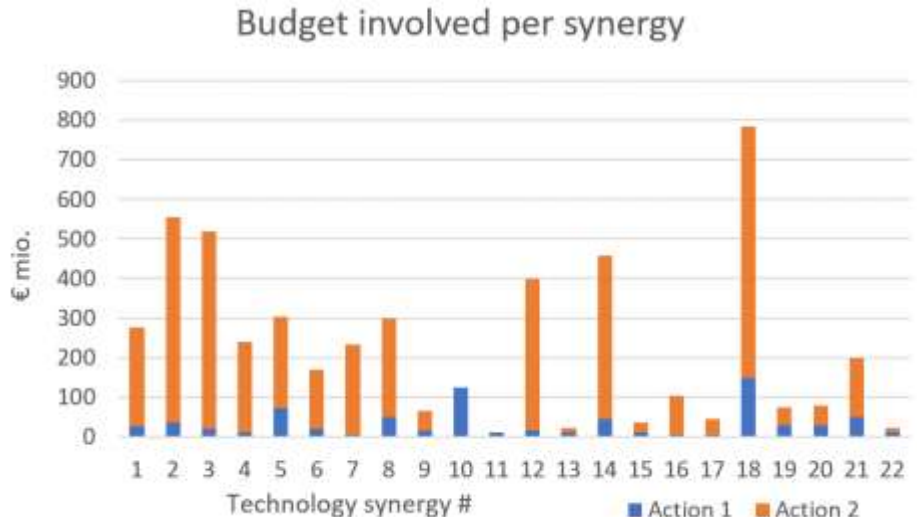


Figure 3. Total budget involved per synergy.

Non-technology issues

Methodology

1.1 Workshop

1.2 IMPLANs

2. List issues

Documentation

3. New fiche

4. Validation by all partner

Non-technology issues

Fiches

- SET Plan IWGs
- Description
- Examples
- Potential actions

13) Improving knowledge transfer mechanisms
SET Plan IWGs
Photovoltaics, Smart cities, Energy Systems, Energy efficiency in industry, Batteries and e-Mobility, Deep Geothermal, Renewable fuels & Bioenergy
Description
Adequate transfer of knowledge and technology from universities and RTOs to industry and of requirements and needs from the latter to the former is key to SET-Plan technologies. An ecosystem of cooperation between industry, research and academia should be built covering the whole value chain. A strong knowledge base is to be developed, on all TRL and MRL levels, to facilitate training of researchers, prototype developers, demonstrators and processes/products designers. Training programmes aim to transfer the latest research generated knowledge are not always well organised or adequate tools and mechanisms are not in place, thus limiting the potential benefits both for higher specialisation and for outreach and job creation. Moreover, academic curricula and educational programmes are not adapted to industrial needs, resulting in companies having difficulties to find employees with the required skills. A holistic approach is proposed for (a) the update of skills and training courses, (b) exchange of best practice between professionals, disciplines and institutions, (c) cooperation between relevant stakeholders in the market and (d) exchange of best practices on successful business models. Only this comprehensive approach will be able to address existing knowledge gaps and lack of awareness in many companies across different sectors.
Examples
• Demand for offshore wind energy is driving demand for skilled professionals in this sector. Not only is the deployment of new wind farms accelerating, but the installed based is ageing, resulting in a need for operation and maintenance personnel, which is difficult to find. • Develop the appropriate, highly specialised professional skills that are required for the bio-industry. This relates to education, training and a better knowledge transfer from science to practice, but also the knowledge exchange and cooperation between the different disciplines and parties in a value chain.
Potential action(s)
Several complementary actions are proposed: • Building an ecosystem of cooperation between academia and industry for sharing knowledge and increasing skills of students and workers along the concept of 'teaching factories' along the whole value chain. The approach should consider realistic settings (e.g. labs) and a holistic view of a specific energy sector • Mapping the methodological approaches and tools available in academia, research organisations and best practices from industry. Maps should be accessible to industry and should be disseminated to training providers in order to coordinate training efforts across Europe • Develop guidelines on multidisciplinary approaches in higher education and research programmes (particularly in Master, Doctorate and Research Programmes) for SET-Plan technologies (e.g. renewables, smart grids) related programmes. These guidelines should become a reference point for the upgrade of existing programmes or the generation of new ones. • Provide more and better support to the existing pan-European infrastructure of experimental test and monitoring facilities and infrastructures • Support the development of a wide portfolio of professional online courses adapted to industrial needs.

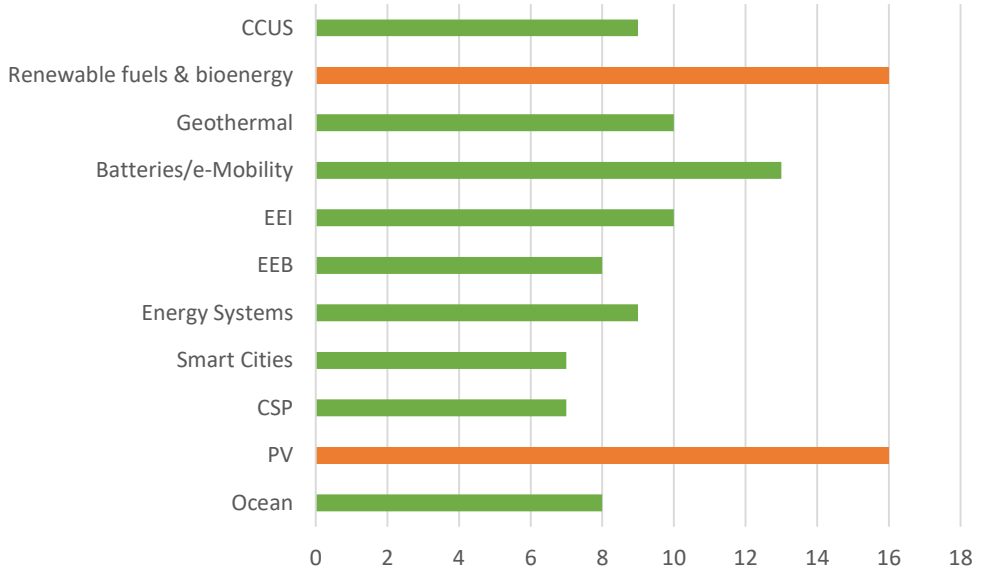
Non-technology issues

Results (I)

Non-technical issue		SMARTSPEND proposed actions
Policy and regulation	1) Towards a long-term and stable regulatory framework	Define a long-term support strategy involving all stakeholders
	2) Covering existing gaps in policy and regulation	Establish Regulatory Innovation Zones (RIZ)
	3) Overcoming potential regulatory barriers	Adopt a scheme similar to EU Innovation Deals or the Dutch Green Deal Programme
	4) Homogeneous national/ transnational regulation	
	5) Fair, faster and simplified permitting processes	Develop guidance documents promoting best practice techniques
	6) Improving public support mechanisms	Multi-year auction schedule for specific technologies Promote and adapt innovative and green public procurement instruments
	7) Reinforcing trust in cooperation instruments	Encourage cooperation mechanisms envisaged in the RED to create a more open and competitive EU market for renewables
	8) Inclusion of environmental benefits in support schemes	Develop a model for the right comparison of the full costs of competitive energies Create of a carbon tax Enforce declaration of environmental impact for the manufacturing processes of certain energy products
	9) Ensuring a level playing field for all technologies/sectors	Create mechanisms for remuneration 'out of the market' Set the conditions to new forms of contracts between relevant parties
Social issues	10) Enhancing public acceptance of innovative technologies/sectors	Use participatory techniques to engage all stakeholders Promote certifications and labels
	11) Increasing public awareness of wider benefits for society	Conduct socioeconomic analysis Adapted raise awareness campaigns
	12) Boosting customer/public engagement	Promote transparency mechanisms Use motivational approach Promote early engagement
Training & education	13) Improving knowledge transfer mechanisms	Build cooperation ecosystem Mapping existing methodological approaches and tools Develop guidelines on multidisciplinary approaches for education and training programmes Support existing pan-European infrastructure of experimental test and monitoring facilities Promote online courses for professionals
Certification & standardisation	14) Developing higher quality standards	Promote harmonisation and cross compliance Develop guidelines on environmental assessment of energy projects Ensure stakeholders participation (especially SMEs) in the development and revision of standards Synchronise standardisation processes with innovation and research
	15) Homogeneous & standardised approach to environmental impact assessment	

Non-technology issues

Results (II)



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THANK YOU!

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