

SPIRE

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On 21 and 22 April the European Commission and the SPIRE Public-Private Partnership (PPP) organised a workshop on the impact of the SPIRE PPP and associated FP7 and Horizon 2020 projects. The workshop took place at Committee of the Regions offices in Brussels. This event was billed as the first in a series of annual impact workshops and saw some 40 process-related projects represented: 12 from Horizon 2020 and 28 from FP7.

Chairing the opening session José Lorenzo Vallés from the European Commission said that PPPs offer a framework to encourage projects to work together and supports transfer of results to the market. But key issues remain: What impact is actually achieved? How can impact be improved? And specifically for SPIRE how is it adding value?



Søren Bøwadt of the European Commission outlined the current status of SPIRE projects in Horizon 2020. “SPIRE is an integral part of the circular economy,” he stated. “As development of the circular economy requires significant RTD and Innovation investments.”

Project presentations

The first day of the workshop saw presentations on project clusters with the aim of assessing the impact achieved, the potential uptake and exploitation, the benefits of clustering and identifying good practise to maximise impact.

The first session covered efficient processes. Prof Andrzej Gorak of TU Dortmund presented results from eight projects in the domain of process optimisation: COPIRIDE, F3-Factory, INCAS, POLYCAT, SYNFLOW, MAPSYN, INNOREX, and ALTEREGO.

Prof Gorak highlighted a range of technical impacts from the development of highly selective hydrogenation catalysts through new synthesis methodologies, and novel modularised processes, process intensification and advanced design of integrated technologies, to combined reaction and separation processes. Cost reduction, better safety characteristics and improved resource and energy efficiency were also targeted.

Adaptable processes

Denilson da Silva Perez of Institut Technologique Foret Cellulose Bois-construction Ameublement (FCBA) based in Bordeaux presented a cluster of projects looking to enable the use of renewable resources, such as biomass and residues from different EU regions, and increase the efficiency and economic viability of the transport of pre-treated biomass from decentralised rural locations.

The projects were AFORE, EUROBIOREF, FASTCARD, BIOGO, CASCATBEL, STEAMBIO, MOBILE FLIP, and PRODIAS.

Five projects in the domain of modelling and elements of process control were described by Sebastian Engell of TU Dortmund. All were of high industrial relevance and covered process control and resource efficiency monitoring. Projects COOPOL and OPTICO focus on control: OPTICO examining multi-scale, multi-phase phenomena to enable new technology and processes with process improvements of ~17%, while COOPOL worked on control and real-time optimisation providing a framework for intensification of chemical processes within a limited timeframe.

MORE looked at near real time monitoring of resource efficiency indicators (REIs) producing novel analytics, and a new process dashboard including visualisation of multi-dimensional REIs. Similarly TOP-REF looked to develop homogeneous audit and diagnosis tools based on thermo-economics techniques. Finally REFFIBRE modelled the impact of innovations on the circular economy for improved resource efficiency.

Integrated process control

Peter Singstad of Norwegian company Cybernetica AS described four SPIRE projects covering control, instrumentation and mathematical modelling with potential to transfer technology and knowledge between sectors.

RECOBA covered real time sensing, advanced control and optimisation of batch processes that could save energy and raw materials. From an economic standpoint the project could lead to material savings of typically to 1-5% and up to 25%. The DISIRE project also used integrated process control based on distributed in-situ sensors to optimise belt conveyor transportation schemes used in minerals, mining and industrial combustion processes. Similarly CONSENS (website under construction) used integrated control and sensing for sustainable operation of flexible intensified processes. The ProPAT project was also developing an integrated process control platform able to utilise individual sensors and methods for multi-sensory inputs leading to more efficient control of processes.

Sebastian Engell noted that for control solutions there was a huge gap between proven technology and what is actually applied broadly in industry. Technical innovation was slow to permeate through to the factory floor despite the relatively low investment required and low risk. This needed to be improved to maximise impact.

Sustainability and Circular Economy

The first domain discussed in the field of sustainability and the circular economy was integrated management of resources. Anna Sagar of SP Technical Research in Sweden described four projects E4WATER (developing and implementing more efficient and sustainable water management in the chemical industry), R4R (improving research and cooperation between chemical regions in Europe), MefCO₂ (using waste CO₂ to make methanol) and TASIO (demonstrating a modular approach to waste heat recovery in the cement industry).

Jan Meneve of VITO then described projects involved in waste recovery. He defined three waves of waste management: first remediation driven by health and safety concepts; then commodity recycling driven by volume issues; and now specificity recycling driven by value considerations. This last wave was the focus of nine projects: RECLAIM, REMANENCE, HydroWEEE, RECYVAL-NANO, REEcover, RecycAl, ReFraSort, C2CA, and BIOMETALdemo. Jan stated that recycling by definition represented the use of smart green technologies that reduced waste generation while improving resource efficiency.

Life cycle Management

The final set of three projects on day one were presented by Amy Peace of BRITEST Limited and concerned lifecycle management. All focused on developing recommendations on the current use of sustainability indicators, tools and methodologies. There was close cooperation between the three projects: SAMT was gathering industrial best practise; STYLE was a pragmatic project looking to see what can be achieved on a day-to-day basis; and MEASURE had the most academic focus to develop an in-depth cross-sectorial Lifecycle Analysis (LCA) methodology. The joint aim is to ensure that the sustainability impact of new SPIRE technologies can be evaluated on a consistent basis.

Plenary and panel discussion

The second day of the workshop was opened by Clara de la Torre, Director 'Key Enabling Technologies' (KETs) at DG Research and Innovation. She noted that SPIRE was now the second largest PPP in Horizon 2020 after the Factories of the Future initiative and she stressed the importance of financial leverage in PPPs. "PPP's follow the same processes as the normal Horizon 2020 programme, but represent a long-term commitment by the Commission to support, and by industry to invest," said Ms de la Torre. But she emphasised that "Impact is the name of the game!"

This theme was taken up by Dr Klaus Sommer, Chairman of A. SPIRE. "[SPIRE] must focus on the 'wow' factor," he said. "Finding good stories to promote in terms of impact and outcomes." The integrated character of SPIRE allowed for a systematic approach to impact from raw materials to end user industries and R&D to the market.

He summarised the expected impacts of SPIRE: to integrate and demonstrate at least 40 innovative systems and technologies. This meant every SPIRE member needed to contribute. He also emphasised the need to make it easier for SMEs to get involved. "The advantage of being in SPIRE is that you can contribute to shaping the future," concluded Dr Sommer. "Rather than just experience it."

The instruments available from the European Investment Bank (EIB) for financing investments in KETs were outlined by Piermario Di Pietro with a specific focus on the InnovFin scheme. He also sought views on access-to-finance experiences, current or past, from established larger SMEs or small mid-caps firms (minimum € 5 million annual turnover).

The next session highlighted four projects that have made high impact: SYNFLOW (looking at innovative synthesis in continuous flow operations in particular to reduce waste in the production of pharmaceuticals and other fine chemicals); COOPOL (looking at control of emulsion polymerisation; specifically intensifying this 100 year-old process); E4Water (looking at increasing eco-efficiency in industrial water management); and R4R, (involving analysis of innovation systems and research agendas in six regional clusters).

The workshop's formal sessions concluded with a wide ranging panel discussion on maximising impact and successful innovation strategy.

Concluding remarks

The meeting rapporteur, Keith Simons, remarked that the FP7 projects presented had clearly developed new technology and methodologies. But he also noted that there was a need to communicate success in terms of hard economic figures. He knew that some excellent process technology success stories were out there that could be used to promote SPIRE. He thought that SPIRE as a concept had been a political masterstroke and that European process community has taken up the challenge. He believed that SPIRE had already had an impact, but needed to better

recognise and exploit success.

Loredana Ghinea, chief executive of the A.SPIRE consortium, outlined the objectives for SPIRE in the coming 12 months. These included preparing for the Horizon 2020 work programmes in 2016-17. There will be a SPIRE brokerage event on 29-30 June and a SPIRE knowledge and dissemination platform was planned to be available by January 2016. This would help to forge connections between businesses and connect the work programmes with actual projects to enable a continuing discussion on future programme development.

A thematic workshop will be held later in 2015 bringing together the different SPIRE sectors to identify and tackle common challenges. The PPP also aims to follow up with all SPIRE projects and provide support for communication and dissemination activities.

Presentations from the workshop can be found here: <https://www.spire2030.eu/news/new/spire-ppp-impact-workshop-2015>

