



mKETs-Pilot lines project

The goal of the mKETs-PL project is to prepare and foster a common understanding and consensus for future actions in Europe focusing on multi-KETs pilot lines



mKETs-PL working document

D4: Mid-term conference report

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- Netherlands Organisation for Applied Scientific Research TNO
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Introduction

Within the framework of the multi-KETs pilot lines (mKPL) project, a mid-term conference has been planned. In parallel, the RO-cKETs project was planning a final conference. In the interest of reaching as wide an audience as possible, the Commission provided that the two events be combined to form a two day event. The first day of the event was dedicated to RO-cKETs and the second day to mKPL. The official title of the conference was **Key Enabling Technologies for a European Renaissance**.

The conference was held on April 2-3, 2014 at the Crescent Brussels meeting centre located at Route de Lennik, 451, Anderlecht, a short walk from the Erasmus Metro Station in Brussels. The conference started at 9:30 and ended at 17:00. In total 166 persons registered to participate, and finally 125 persons signed in at on-site registration. There was a good representation from industry, research and policy makers from EU and national governments.

This report covers only the results and conclusions of the second (mKPL) day.

Objectives of the conference

For the multi-KETs project, the mid-term conference is intended to satisfy a multiplicity of objectives:

- Introduce the public to the concept of Key Enabling Technologies and multi-KETs pilot lines
- Present the main actions and programmes underway at the Commission concerning KETs
- Provide relevant keynote speakers with experience in KET pilot lines
- Present the preliminary findings of the first half of the project (including country studies and on-line survey)
- Introduce the demonstrators that have been selected for further study in the project as well as the planned demonstration activities
- Provide a forum for interaction with the audience through focused parallel sessions

Ultimately, the outputs from the mid-term conference should either validate and/or refine the main observations put forward by the consortium of the mKPL project. The conclusions will eventually be translated into general guidelines and best practices for effective policy measures relative to pilot production implementation.

Conference agenda

Agenda Day 2 of Key Enabling Technologies for a European Industrial Renaissance

- 09:00-9:30 Registration/coffee
- 09:30-9:40 Welcome introduction by the Chairman
 Thomas Reiss, Fraunhofer ISI
- 09:40-9:50 KETs and the multi-KETs pilot lines project
 Gavino Murgia, Deputy Head of Unit KETs and Digital Economy, DG Enterprise and Industry, EC
- 09:50-10:10 The multi-KETs project, results to date and view on demonstrators
 Maurits Butter, TNO
- 10:10-10:40 Keynote 1 – Managing the complexity of a large pilot line activity
 Roberto Zafalon, ST Microelectronics
- 10:40-11:10 Keynote 2 – Bio Base_Europe_Pilot_Plant: industrial biotechnology innovation tool tailored to the needs of SME's
 Brecht Vanlerberghe, BBEPP
- 11:10-11.30 Coffee
- 11:30-12:00 Keynote 3 – Seeding Innovation in Central Ohio
 Wayne Embree, Executive Vice President TechColumbus
- 12:00-13:00 Lunch and networking
- 13:00-13:45 Showcase of the multi-KETs Pilot Line Demonstrators
 Flexible Printed Electronics, Tommy Höglund, Acreo
 EPT300-EPPL, Cristina de Luca, Infineon
 Sofradir Pilot Line, Michel Guillermin, Sofradir
- 13:45-13:55 Introduction to the parallel sessions
- 14:00-15:15 Parallel sessions
Large Pilot Production Activities: This session will focus on how to deal with complex issues such as high capex, multi-source financing, regulatory issues, partnering with suppliers, and assessing impact. Chair: Andreas Wild, director of ENIAC
SMEs and Pilot Production Activities: SMEs have special challenges in engaging in pilot production activities, such as Intellectual Property management, obtaining funding, developing supplier networks, or choosing when to invest. This session will explore these issues with references to real case examples. Chair: Roger Whatmore, Imperial College
Facilitating Pilot Production Activities: How can public policy contribute to making pilot production activities operational (regional, national, EU)? How can regional development agencies be involved? What should be the role of technology platforms, multi-user facilities? Chair: Luuk Borg, DG Connect
- 15:15-15:45 Coffee
- 15:45-16:15 Feedback from parallel sessions (by session chairmen)
- 16:15-16:45 Upcoming multi-KETs Demonstration activities
- 16:45-17:00 Farewell remarks from the Chairman
- 17:00 Social time for discussion

Conference Highlights

The conference presentations provided a wealth of information and some very interesting perspectives related to implementation of KETs pilot production activities. Several presenters exposed their actual experiences with setting up and operating pilot production activities. Some of the more important take-away messages of the main presentations are listed below:

Gavino Murgia, EC - Key Enabling Technologies for a European Industrial Renaissance

Gavino introduced the six key enabling technologies that have been identified by the Commission through a long process starting in 2009 and resulting in a finalisation of a strategy for Key Enabling Technologies issued in 2012. The KETs are important because they are at the crossroads of different policy initiatives, including not only industrial policy but as well for the Innovation Union as they are an important part of Horizon 2020. The Commission has devoted significant effort to creating a common understanding of the importance of KETs for industrial competitiveness and the challenge of crossing the “valley of death” to reach the marketplace with products that are globally competitive. The final impact of this market success will be growth in the European economy and jobs.

Maurits Butter, TNO – multi-KETs Pilot Lines project

Maurits introduced the multi-KETs Pilot Lines project and objectives. The definition of multi-KETs was introduced and explained. The relative positioning of pilot production on the TRL scale, the relationship between process and product and the typical characteristics of pilot production activities were given. Some of the initial results of the project were shown, as well as the future work of the project related to the evaluation of four pilot production demonstrators.

Roberto Zafalon, ST – Managing the Complexity of a Large Pilot Line Activity (Lab4MEMS)

Roberto provided his experience in setting up a large microsystem pilot line in Italy. Initial financing totalled 28 million € and involved 21 partners (of which 3 SMEs) from 10 member states. The pilot line demonstrated the “key enabling” nature of the devices that would be produced, providing new functionality to many existing and emerging products manufactured by their customers. The lessons learned showed the difficulties to mobilize funding from multiple member states and the EU in a single project. A second point is that the pilot line is able to validate many different product demonstrators which are the critical decision points for acquiring new customer contracts and moving into commercial production.

Brecht Vanlerberghe, BBEPP – Bio Base Europe Pilot Plant

Brecht presented the BBEPP industrial biotech pilot plant founded with public support in Ghent. The facility is a not-for-profit scale-up facility servicing SMEs and large companies in the industrial biotech sector. The main take-away messages included the need for remaining independent with respect to any one client, the need for responsible treatment of confidentiality issues and the difficulty for a service facility to find the capital needed for re-investment.

Wayne Embree, TechColumbus – Seeding Innovation in Ohio

As a guest speaker, Wayne provided a perspective of a US based technology development incubator. His main messages covered the difficulty in obtaining new funds for investment in future generations

of start-ups, the funding mechanisms in place in the US for grants such as SBIR, the needs for start-ups to be market focussed, customer driven and cash conscious.

Tommy Höglund – Acreo Printed Electronics Pilot Facility

Tommy introduced the Acreo printed electronics facility which is one of the four mKPL demonstrators. A main message is the need to engage equipment and materials suppliers in the pilot facility in order to bring forward the technology as well as the required equipment at the same pace in order to be ready for production. Also getting first customers with potential products is important for showing capability.

Cristina De Luca, Infineon – Demonstrator for Advanced Semiconductor Manufacturing

Cristina presented an example of a very large pilot production activity for power semiconductors. The main messages was that dividing a very large project into smaller manageable projects is preferable because you can: -keep the relevant ecosystem partners together in a smaller group where they can interact more efficiently, -address different project needs (such as technology, equipment, design, etc.) with different (more appropriate) consortia and/or funding agencies. The main idea is to remain focussed and not try to do everything at once, step by step is the best way.

Michel Vuillermet – Sofradir

Michel provided insight into the steps of setting up an industrial pilot line for infrared imagers in cooperation with an RTO and equipment suppliers. The main message was the need to transfer knowledge and know-how from one team to the next from R&D to the technical department, to the process team and finally to production. Michel gave a very good overview of the progression through the various TRL levels and the groups involved.

The presentations have been made available to the participants on the mKPL-website:

<http://www.mkpl.eu/conference/programme/>

Key messages - Conclusions

- Multi-KETs refers to the combination of at least two key enabling technologies in a high tech production environment.
- Pilot production (including pilot lines, pilot plants, pilots, etc.) refers to a stage of industrial development which directly precedes production. Pilot production will generate pre-series, trial runs, customer samples, product mock-ups. The output of pilot production could be provided to potential customers without warranty and without liability on the part of the manufacturer.
- Pilot production is the final stage leading up to commercial exploitation and is critical for obtaining a return on investment for R&D expenses.
- Bridging the manufacturing “valley of death” (from R&D to product innovation) requires coordinated efforts along the value chain (industrial networks) in order to be effective. Public support can proactively engage such networks in Europe.

From the **Large industrial pilot lines** session:

- Pilot lines require very sizeable investments. The size of pilot line projects from the ENIAC experience shows a range of 10-450M€, while in the chemical industry the range is 15-50M€.
- The size and complexity of large industrial pilots is best addressed in stages, for example with several successive projects. This approach requires coordination and commitment, both from industrial consortia and public authorities.
- In the semiconductor industry almost no stand-alone labs are feasible, R&D is done in “lab-fabs”, which are not taken into account in H2020
- Time to market is essential for new products, so all elements need to come together quickly, including both the industrial agreements and the participation of public authorities. Notification induces delays which could potentially be detrimental.
- Large pilot lines involve many industrial and academic partners, from across the value chain, including SMEs. The ENIAC experience actually serviced more SMEs (by number) than large companies.
- Combined funding is an interesting concept that would allow higher percentages of public funding for investments, although the practicability has to be proven.

From the **SME** session:

- The notion of “time to money” is very important (time to money is the delay between a request for funding and the reception of funding)
- Access to capabilities for technology testing, validation and prototyping are necessary
- SMEs have a greater challenge to transition to manufacturing than large enterprises because of capital constraints.
- For start-ups, early stage funding is still an issue. Angel investments are advantageous because business angels not only reinvest their own earnings but are also technically skilled and have entrepreneurial expertise. Professional experience can help SMEs progress quickly and avoid costly mistakes.
- Large companies can offer good B-to-B market opportunities to SMEs,
- Validation services for SME have to be flexible regarding contractual and technological issues and should keep the agreement negotiations to a minimum.
- RTOs, offering validation services, should build a network to cover all different technologies and equipment, making it easier for SMEs to find appropriate partners. Moreover they should do more advertisement in particular in SME communities.
- Entrepreneurial training and people with related skills are as important as technology and market experts.

From the **Policy** session:

- Combining funding from multiple sources is needed for large projects, but is not straightforward; it often requires an entirely different approach for a second source of funding.
- Open access pilot lines are to be one priority, in this regard national funding is also needed
- Flexible financial instruments are needed
- Parallelisation of EU, national and regional funding are crucial
- Instruments to allow access to pilot production environments are needed for SMEs
- Roles of each governing body need to be clear, EC should put measures in place, but regions need to set their priorities.
- New IPCEI strategy will allow for large projects with common European interest to be established and could help to overcome some of the challenges

Overall conclusions from the three parallel sessions:

A policy for pilot production should include:

- Flexible financial instruments (based on the right incentives)
- Reliability and speed of access
- Straight forward eligibility rules (e.g. limitation up to the point where you take liability for your products)

A policy should not:

- Suppress economic incentives
- Have too high funding percentages
- Constrain regions, it should be promoted and advertised to regions to stimulate them, a “business plan” for regions is needed.

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