PROJECT FINAL REPORT

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LIST OF ABBREVIATIONS

BCS NL	Business Cluster Semiconductors Netherlands
EBRC	European Business and Regulatory Cooperation
ECCT	European Chamber of Commerce Taiwan
ECEI	European Cluster Excellence Initiative
EEN	Enterprise Europe Network
EETO	European Economic and Trade Office
ERDF	European Regional Development Fund
ESCA	European Secretariat for Cluster Analysis
GDP	Gross Domestic Product
HTNL	High Tech NL
ICT	Information and Communication Technology
IoT	Internet of Things
IT	Information Technology
ITRI	Industrial Technology and Research institute
JAP	Joint Action Plan
JTIs	Joint Technology Initiatives
KET	Key Enabling Technology
KPI	Key Performance Indicators
MNE	Micro- and nanoelectronics
MOEA	Ministry of Economic Affairs
MOST	Ministry of Science and Technology
MS	Milestone
R&D	Research and Development
RTD	Research and Technological Development
RTO	Research Technology Organisation
S&T	Science & Technology
SME	Small and medium-sized enterprises
TSIA	Taiwan Semiconductor Industry Association
VCs	Venture Capitalists
WP	Work Package

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FINAL PUBLISHABLE SUMMARY REPORT

1 Executive Summary

Micro- and nanoelectronics (MNE) are essential for the prosperity of Europe: Micro- and nanoelectronics are everywhere. Without this technology, we would have no computers, mobile phones, household appliances or motor vehicles. Further down the value chain, electronic components also contribute to the improvement of manufacturing processes and thereby enable new technologies to evolve. Micro-and nanoelectronics are a key driver for innovation in almost all sectors and industrial fields. The European Commission, by designating micro- and nanoelectronics as one of Europe's Key Enabling Technologies, acknowledges the importance of the sector for the development of industry in Europe as well as for the future prosperity of the entire continent.

As a Key Enabling Technology, micro- and nanoelectronics, including the use and production of semiconductors, are essential for all goods and services, which need intelligent control and communication. This applies to sectors as diverse as transportation, health, security and energy. To counteract the increased global demand for energy and to avoid undesirable environmental consequences, more intelligent and efficient management of conventional fuels and their utilization is necessary and this is where micro- and nanoelectronics become indispensable.

Silicon Europe is the brand under which the leading micro- and nanoelectronics (MNE) clusters in Europe collaborate to represent, support and promote the companies and organisations belonging to their ecosystem both on European and global level. Silicon Europe acts as intermediary between all the relevant partners from research and academia, public authorities and the industry. Within the project, six world-class clusters from five leading micro- and nanoelectronics regions have collaborated to create an open European collaborative platform to strengthen the leading role of the European semiconductor industry in the global economy and value chain. Based on that work, the members of Silicon Europe have a three-year experience in successful collaboration within the cross regional ecosystem facilitating cross regional partnerships and business relations.

The major outcome of the project is the Joint Action Plan, a step-by-step strategy for the time till 2018. It describes the agreed actions to be taken by the Silicon Europe meta-cluster in order to complete the goal of the project: "make Europe the world leader in innovative electronics". The cluster partners identified five strategic themes that need to be addressed in order to strengthen Europe´s competitiveness. The decision was taken to continue the strong cooperation beyond the timeframe of the project, as an association welcoming other European micro- and nanoelectronics clusters and further deepening the partnership to implement the Joint Action Plan. Another six European clusters have joined the Silicon Europe Alliance in October 2015. The new members enlarge the Silicon Europe partnership both geographically and technologically. Now the Silicon Europe Alliance unites 12 European micro- and nanoelectronics clusters with about 2,000 cluster partners.

2 Project context and objectives

Five of the leading **European micro- and nanoelectronics regions** have joined their research, development and production expertise to form the transnational, research-driven cluster "Silicon Europe – The Leaders for Innovative Electronics". The cluster partners include national consortia that all have established structures for the close cooperation of research, business and the authorities ("triple helix"). Within the triple-helix consortia are the following six strong MNE cluster:

- Silicon Saxony (Dresden, Saxony, Germany)
- Minalogic (Grenoble, Rhône-Alpes, France)
- DSP Valley (Leuven, Flanders, Belgium)
- High Tech NL (Eindhoven, South and East Netherlands, The Netherlands)
- Business Cluster Semiconductors (Nijmegen, The Netherlands) as associated partner
- ME2C (Villach, Carinthia, Austria) as associated partner

The partners of Silicon Europe are linked by a common goal: to secure Europe its position as the world's leading centre for innovative electronics. While aiming to reach this main goal, Silicon Europe will make substantial contributions toward realizing several partial goals that will be of crucial importance for Europe´s future economy (regarding Europe´s competitiveness), science (regarding the securing of know-how for the manufacturing of KET-relevant technologies) and society (regarding solutions for global mega trends).

Within the project, the six world-class clusters from the five leading micro- and nanoelectronics regions have collaborated to create an **open European collaborative platform** to strengthen the leading role of the European semiconductor industry in the global economy and value chain.

Silicon Europe will **intensify the transnational collaboration** between the regional research-oriented competence clusters and will make a substantial contribution to the "Europe 2020" agenda, an economic program initiated by the European Union. The program's focus is the advancement of research and development (R&D). This includes the development of environmentally friendly technologies as well as activities to secure consistent economic growth. The Silicon Europe partners bring together their know-how and concentrate on realizing the two flagship initiatives "Resource Efficient Europe" and "Digital Agenda". The results of the Silicon Europe collaboration will produce an additional positive effect on the "Industry Politics in the era of Globalization" as well as the "Agenda for new Capabilities and Employment".

The **specific objectives** of Silicon Europe are:

1) **Promotion of micro- and nanoelectronics** as Key Enabling Technology for the traditional industry, unlocking new solutions for the major societal challenge on energy efficiency. This promotion will be supported by the development of a new communication concept on the strategic importance of micro- and nanoelectronics.
2) **Securing European know-how for Europe:** Using inter-cluster synergies and complementarities

a. with research institutes and universities, for access to the newest technologies and to highly qualified competencies and staff,
b. with fabless design houses for the development of new functionalities and/or architectures for the micro- and nanoelectronics,
c. and with value adding system integrators for the market valorisation.

3) **Opening up new markets** and boosting competitiveness especially of SMEs by improving innovation and technology transfer from research to market, and by developing an internationalization strategy inside and outside Europe, supported by the creation of a common identity for a (virtual) European semiconductor cluster.

Problem description – The need for resource and energy efficiency

Due to the emergence of developing and transitioning countries - particularly China and India - and the resulting rise in living standards of the population, world energy demand is dramatically increasing. All scenarios within the "Energy Roadmap to 2050"[1] show **electricity will have to play a much greater role** than now and will have to contribute to the decarbonisation of transport and heating/cooling. Electricity could provide around 65% of the energy demands of passenger cars and light duty vehicles, as shown in all decarbonisation scenarios. Final electricity demand increases even in the high-energy efficiency scenario. Consequently, according to the Roadmap, prime focus should remain on **energy efficiency**. Therefore, improving energy efficiency is a priority in all decarbonisation scenarios and thus also one of the major challenges with regard to the flagship initiative of a resource efficient Europe.

Contribution of micro- and nanoelectronics to the solution of the problem

As one of the key enabling technologies, micro- and nanoelectronics, including semiconductors, are essential for all goods and services which need intelligent control in sectors as diverse as automotive and transportation, aeronautics and space. Smart industrial control systems permit more efficient management of electricity generation, storage, transport and consumption through intelligent electrical grids and devices[2]. Smart control systems are also crucial to increasing the efficiency and reducing the unwanted emissions related to the use of conventional fuels (oil, coal and natural gas) in all its forms and applications.

Nevertheless, Europe has a number of dedicated regions with critical mass and particular semiconductor competencies which are recognised world-wide. These clusters, which jointly will implement Silicon Europe, address all application fields and have access to the most advanced technologies.

Micro- and nanoelectronics are the basis for a strong European economy. There is no computer, mobile, appliance or even car without it. Electronic components also contribute to improving

[1] The EU is committed to reducing greenhouse gas emissions to 80-95% below 1995 levels by 2050. The Roadmap explores the challenges posed by this object while at the same time ensuring security of energy supply and competitiveness.
[2] http://ec.europa.eu/enterprise/sectors/ict/files/communication_key_enabling_technologies_sec1257_en.pdf

manufacturing processes or to enabling new communication technologies. Thus, micro- and nanoelectronics are a key driver for innovation for almost all sectors and a key enabling technology for the vast number of industrial fields and sectors.

Without key enabling technologies, such as micro and nanoelectronics leading to new applications within building automation and controls as well as demand response, achieving substantial energy efficiency improvements will only remain a dream.

As a conclusion, the most urgent challenge in micro- and nanoelectronics is to increase massively energy efficiency, especially in its key sector ICT. This need arises from the future availability of resources (the finite nature of fossil fuels) and the increasing demand for energy worldwide (also, since even the continued development of renewable energies will not be enough close the large gap in demand). Substantial progress can only be achieved through key innovations and new system approaches that are based on a combination of cutting-edge in scientific research, close-to-market development and world-leading know-how in manufacturing processes.

By joining technological expertise and resources of Europe's leading actors in European micro- and nanoelectronics the Silicon Europe cluster, will create a **new quality of transnational collaboration**. This will enable Europe to become the world's leading centre for energy efficient electronics while effectively working to counteract increasing energy demand.

The participating clusters form the core for a leading edge cluster dealing with one of the most important key enabling technologies, namely micro- and nanoelectronics. Based on their unique combination of synergetic strengths, Silicon Europe has the potential to contribute significantly to the achievements of the aims of the Strategy for a resource efficient Europe.

Silicon Europe will have a **global visibility** and will also be highly competitive, focusing on the innovation component of energy efficiency.

The following picture shows the competences and strengths of the involved clusters on different levels.

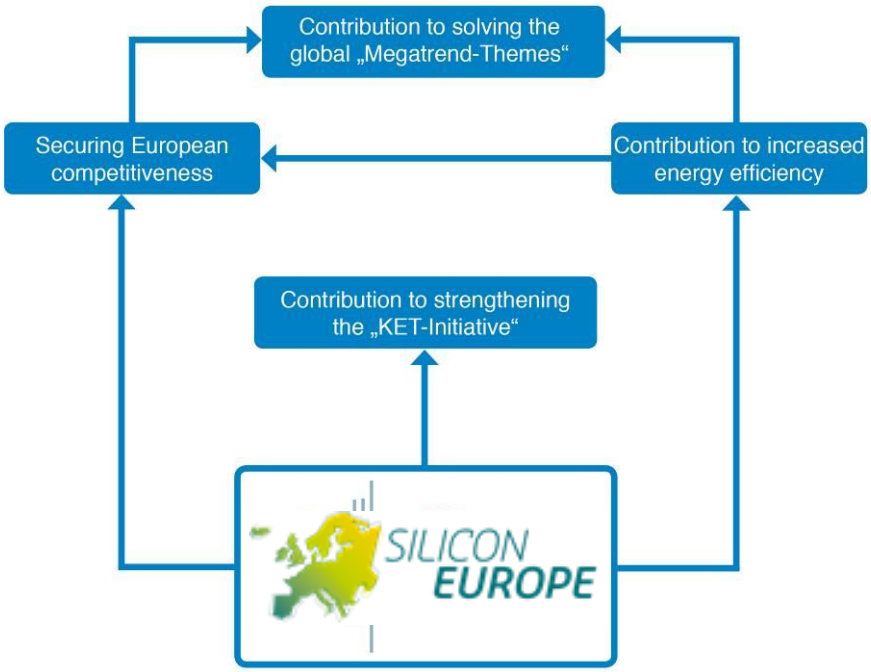


Figure 1: Competences and strengths

Silicon Europe's efforts in micro- and nanoelectronics will significantly contribute to Europe's economic and innovative strength – both in the short and the long term. In the short term, micro- and nanoelectronics will help traditional industries to **open up new markets** and their utilisation will lead to the increase of energy efficiency in all sectors. Furthermore, Silicon Europe completes and strengthens the value chain of Europeans semiconductor eco-system and will be a role model for **inter-cluster cooperation**. Ultimately, the European semiconductor industry will be boosted and thus enabled to take on the Asian and global challenge on the market. The Silicon Europe initiative will **raise the awareness** of the importance of the European semiconductor industry in the wider public and authorities.

The capacity to generate innovations and successfully transfer them to the market is a key skill for Europe. This innovative force is decisive for the competitiveness and therefore ultimately for Europe's sustainability. In order to maintain and strengthen Europe, securing the innovative ability must be equated with securing the future of Europe. It is a task to look far ahead into the future and to detect even weak signals in order to identify any resulting changes, to verify the relevance of these changes and assess them from a strategic viewpoint.

Micro- and nanoelectronics have a major impact on and therefore will make a significant contribution to the successful handling of the mega trends, Europe is confronted with, including e.g. climate protection, a society that is shifting from industry to knowledge, the globalisation and optical, energy and environmental technologies. Mostly, the sector's developments and its findings regarding energy efficiency are effecting not only the technical disciplines but also the population's daily life.

3 Main S & T results/foregrounds

3.1 Overall Strategy

Silicon Europe was organised in six work packages. There were three different implementation phases of the project:

a) phase 1 (WP 2) = **in-depth analysis phase**, allowing to have a comparable information basis for the decisions to be made in phase 2 for all participation clusters as well as mapping of other relevant micro- and nanoelectronics clusters including relevant key indicators.

The decision on the differentiation of S&T objectives on the regional level (**harmonised smart specialisation**) while using all potential synergies forms the milestone MS1 that leads to the shift into phase 2.

b) phase 2 = the core of the project: Within WP 3 and WP 4, a **Joint action plans** was drafted with regard to the smart specialisation, additionally there will be an harmonised joint action plan for the virtual cluster at a European level. In this regard, within WP 4, a dedicated strategy for internationalisation have been developed.

This includes also dedicated actions in an **internationalisation strategy** for dealing with the global competitors as well as potential collaborators (e.g. clusters in UK or Italy) on a European level.

c) phase 3: Within WP 5, **accompanying measures** such as joint recruitment campaigns and joint training sessions have been taken place in order to facilitate the implementation of the action plan(s).

WP 1 – Management as well as WP 6 – Communication and dissemination were implemented throughout all phases, allowing a smooth implementation within time, budget and quality of the envisaged objectives. Within WP 6 different ways of communicating the key messages were developed for the different target groups.

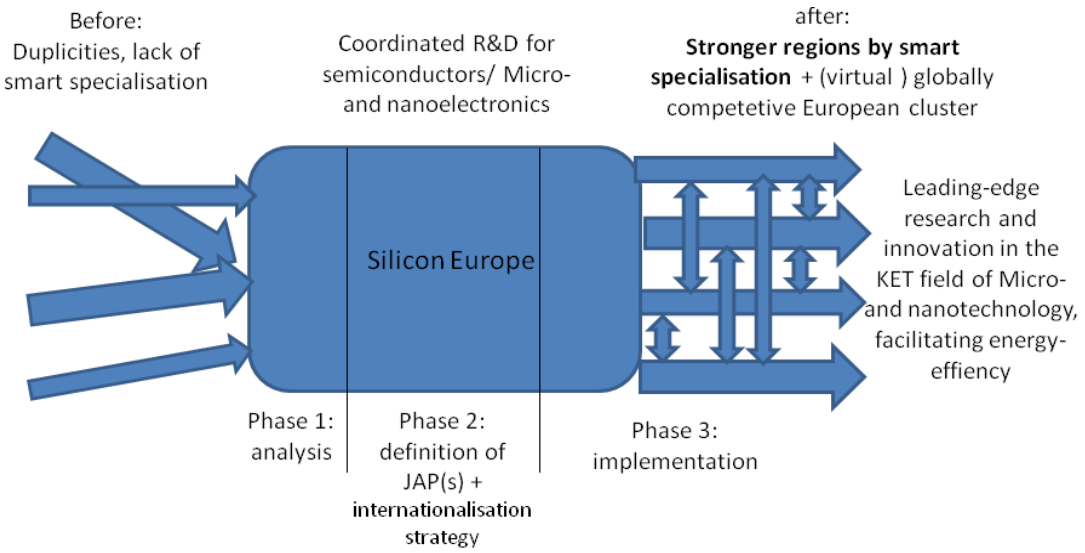


Figure 2: Phases of project

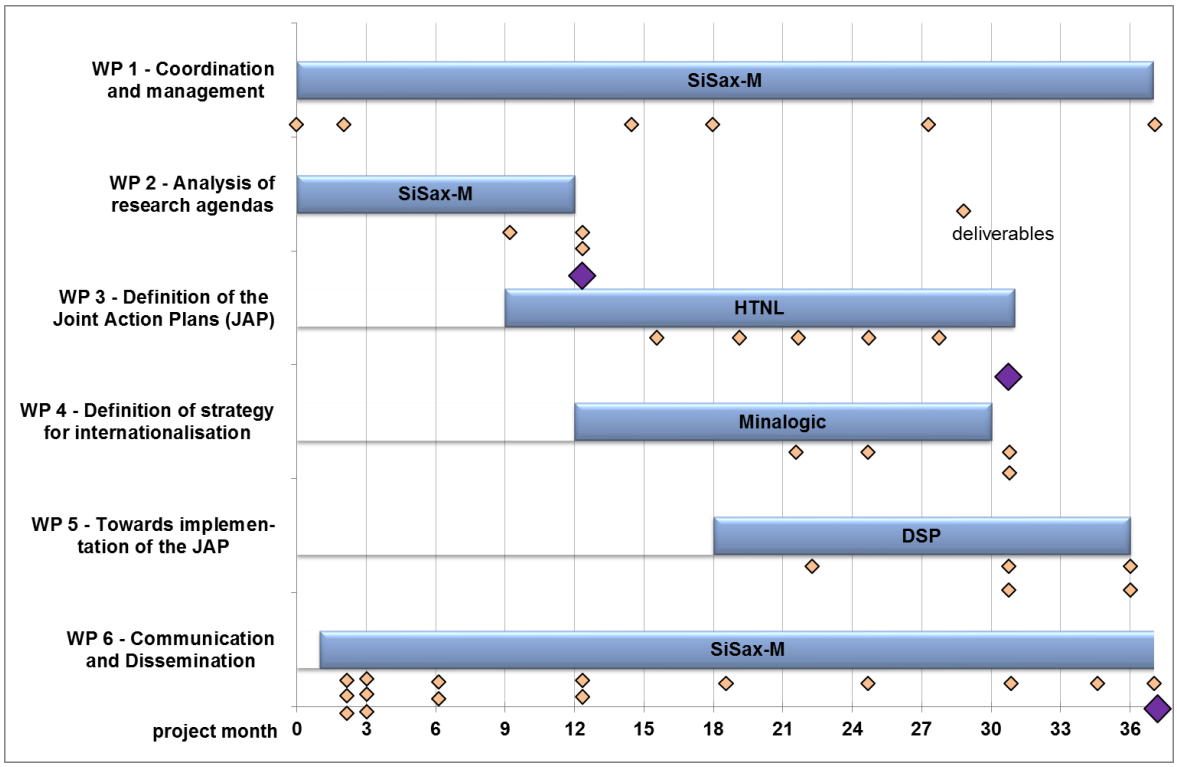


Figure 3: Timeline work packages

3.2 Main Outcomes

The main outcomes of the project are:

- Extension of partly existing cooperation between mature European micro- and nanoelectronics clusters
- In-depth SWOT analysis of existing policies of the relevant stakeholders and development of respective recommendations for improvement/harmonisation, contributing to the development of **regional smart specialisation strategies**
- Development of **Joint Action Plans** within the participating regions
    - joint strategy for internationalisation
    - transfer of best practices between the regions regarding improvement of collaboration
    - dedicated financial plan for implementation
- Boosted competitiveness through the development of a joint internationalisation strategy, including development of a **common visual identity**, and including **partnerships with other European and world-wide clusters**
- **Staff exchanges** to initiate common projects
- Promotion of the visibility of regional research driven clusters and promotion of the utilization of micro- and nanoelectronics as key enabling technology, by a series of regional level and European level workshops, development of various communication material

3.2.1 In depth analysis

During **phase 1 (WP 2)** an in depth-analysis of the involved regional ecosystems and clusters were made to identify complementarities, synergies and smart specialisation potential. The analysis gives an inside into the existing local situations considering the following topics:

- Regional RTD and economic development policies, plans and activities
- Regional public and private RTD actors as well as financial actors related to RTD
- Existing regional smart specialization strategies
- Existing regional cluster policies

Data collecting was completed with report **D2.1 Regional cartography on RTD.**

For all cluster partners a common semiconductor value chain were defined, which was the basis of the detailed analysis of the respective regional ecosystems.

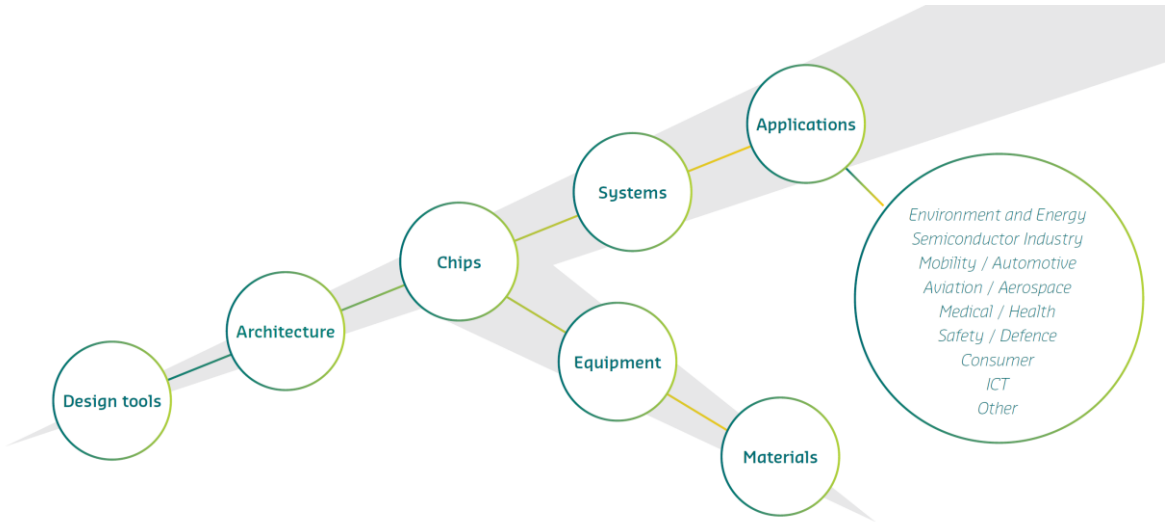
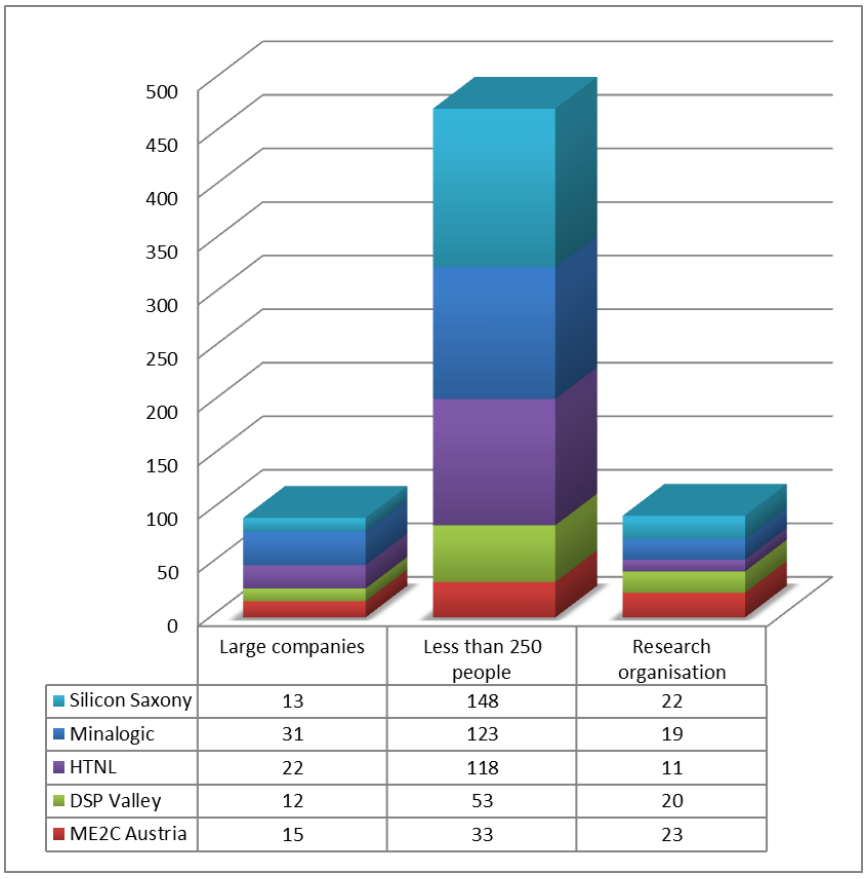


Figure 4: Silicon Europe Value Chain

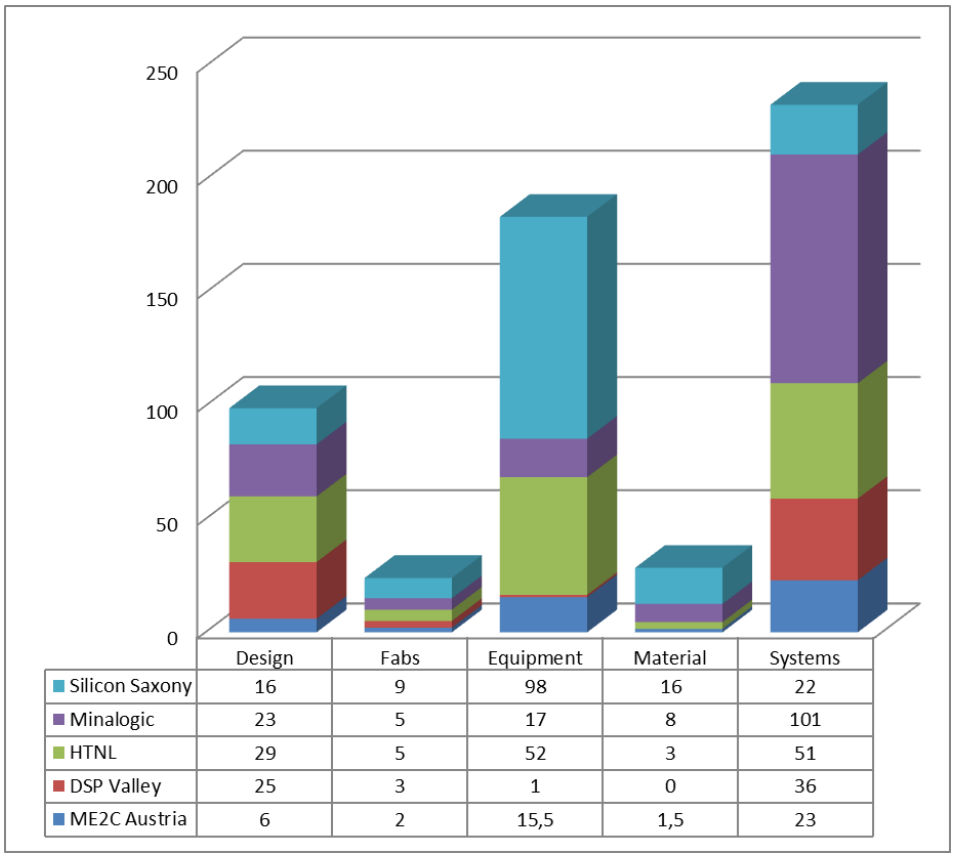
For data access reasons, only companies that are member of one of the relevant cluster organisations have been assessed.

Cluster members that are not directly involved in the semiconductor value chain (such as public authorities or companies delivering horizontal services such as accounting etc.) have not been taken into account.



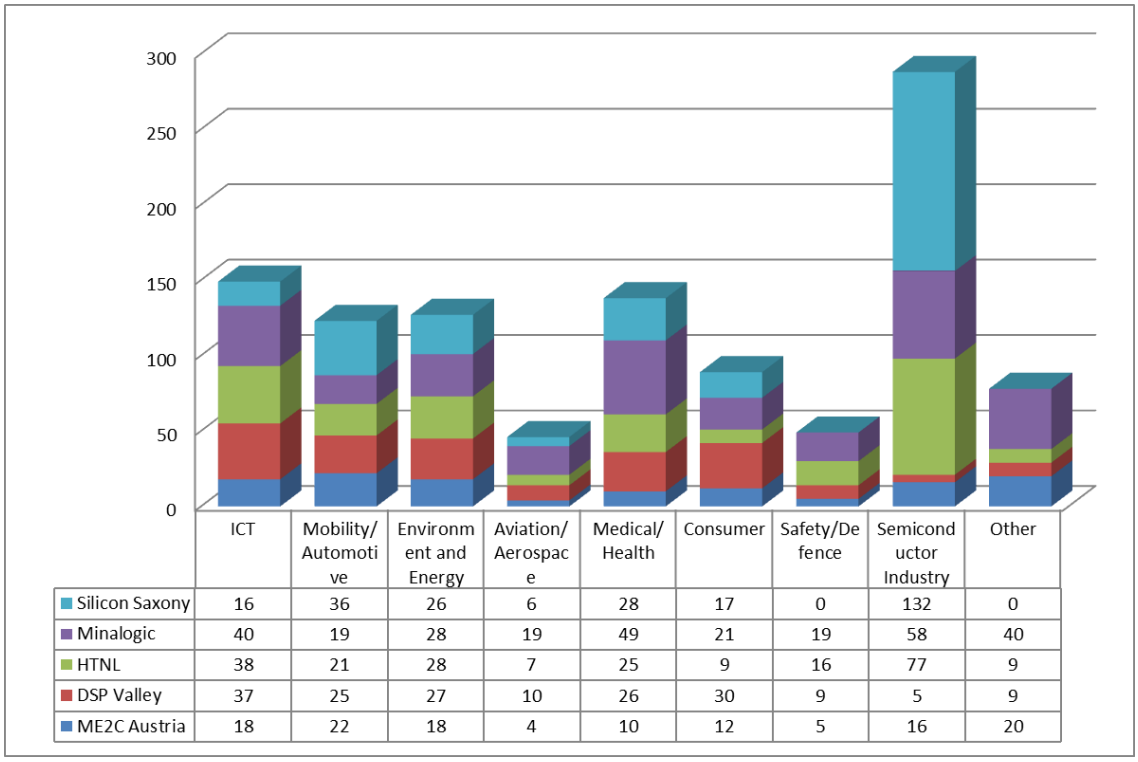
	Large companies	Less than 250 people	Research organisation
Silicon Saxony	13	148	22
Minalogic	31	123	19
HTNL	22	118	11
DSP Valley	12	53	20
ME2C Austria	15	33	23

Figure 5: Silicon Europe Cluster structure, # of organisations



	Design	Fabs	Equipment	Material	Systems
Silicon Saxony	16	9	98	16	22
Minalogic	23	5	17	8	101
HTNL	29	5	52	3	51
DSP Valley	25	3	1	0	36
ME2C Austria	6	2	15,5	1,5	23

Figure 6: Silicon Europe Value chains, # of organisations



	ICT	Mobility/ Automotive	Environment and Energy	Aviation/ Aerospace	Medical/ Health	Consumer	Safety/Defence	Semiconductor Industry	Other
Silicon Saxony	16	36	26	6	28	17	0	132	0
Minalogic	40	19	28	19	49	21	19	58	40
HTNL	38	21	28	7	25	9	16	77	9
DSP Valley	37	25	27	10	26	30	9	5	9
ME2C Austria	18	22	18	4	10	12	5	16	20

Figure 7: Silicon Europe Market focus

A **regional SWOT analysis** from an economic, innovation and RTD perspective has been elaborated for each region to explore the potential for each region for a **smart specialisation strategy**. It can be

concluded that all five clusters together have **strengths along the whole semiconductor value chain**. An overview for all clusters is shown in figure 8 (bigger font means the cluster has particularly high competences compared to the other regions). The regional SWOT analysis was completed with the report **D2.2 "Regional SWOT analysis from an economic, innovation and RTD perspective"**.

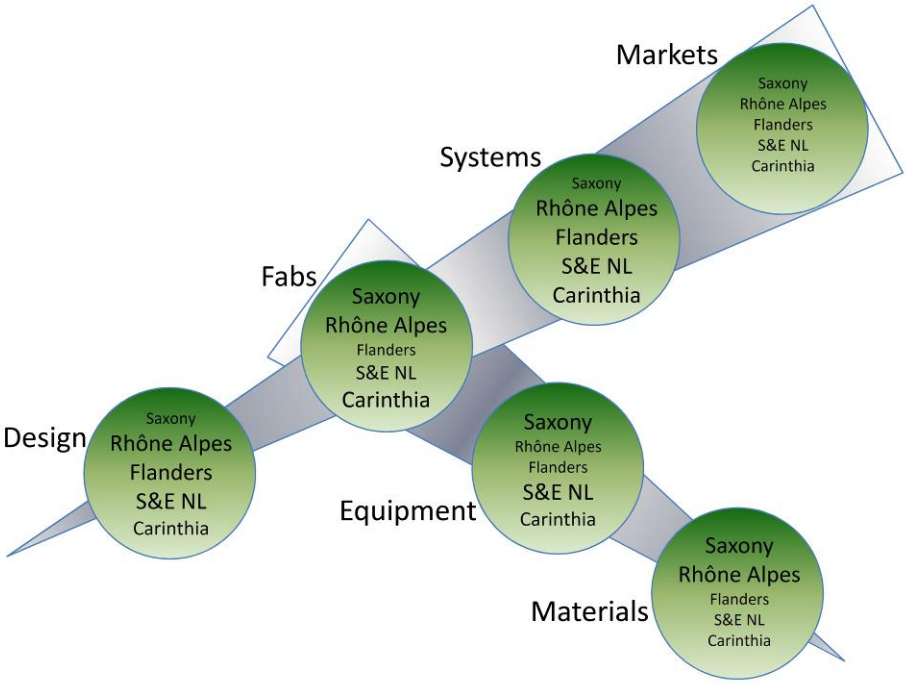
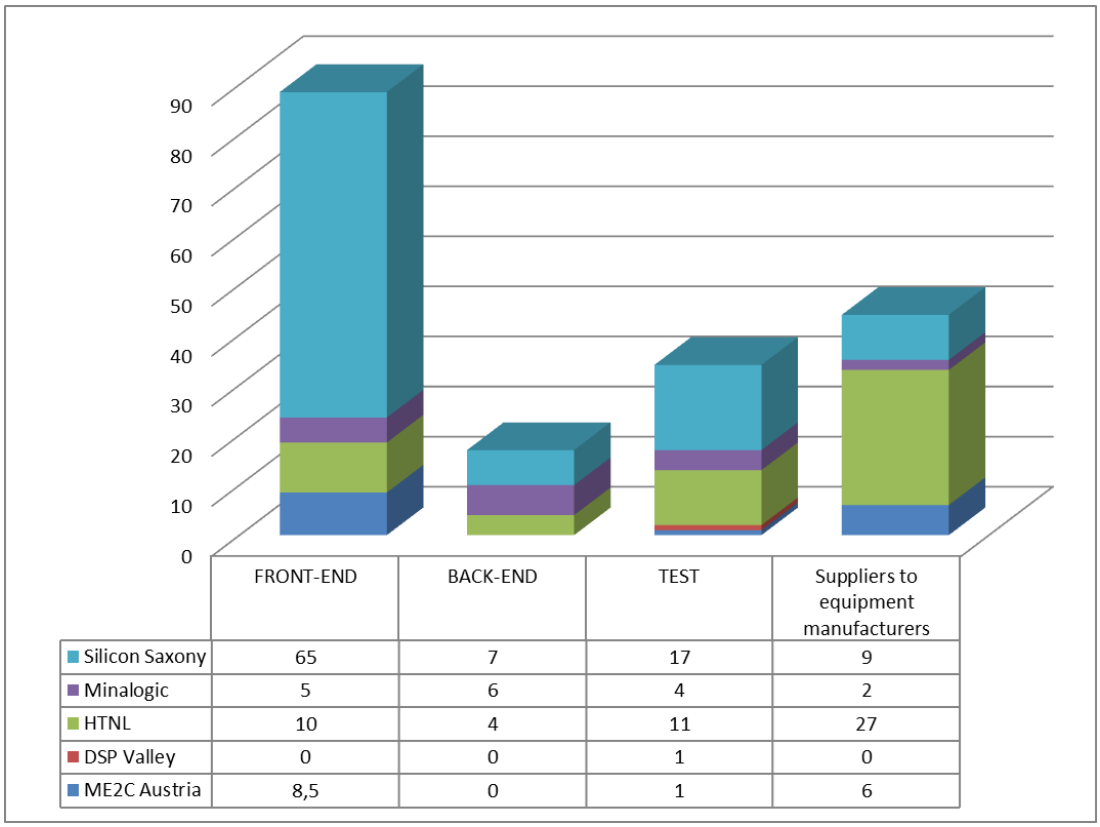


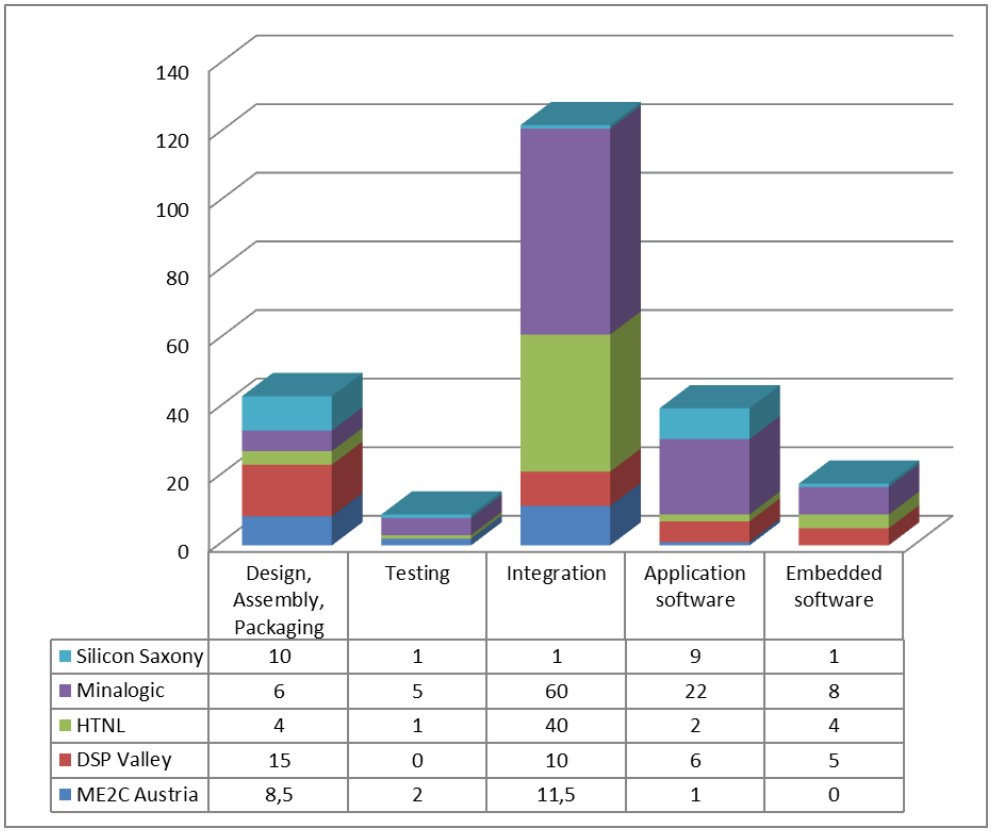
Figure 8: Joint value chain with focus for potential smart specialisation

Common weaknesses for all regions are linked to the **typical small and medium sized enterprises structure**, for example, less impact on policymaking, dependency on large enterprises or less production volume. Most of the clusters see strong potential for future growth in the field of **applications and application platforms**. There is even a clear expectation that by combining competences from the different regions, this field should become a strong European asset. Key aspects are actions to work out a strategy and take action to enhance the inter-European cluster cooperation as an enabler on specific (technological) topics. It is important to improve the cooperation between SMEs (the majority in all clusters) and the large enterprises (the largest employment source). Asia as the upcoming innovator has been identified as common threat of all five clusters. There are overlaps of competences per region as well differences, for example in the sub value chain for equipment or Systems.



	FRONT-END	BACK-END	TEST	Suppliers to equipment manufacturers
Silicon Saxony	65	7	17	9
Minalogic	5	6	4	2
HTNL	10	4	11	27
DSP Valley	0	0	1	0
ME2C Austria	8,5	0	1	6

Figure 9: Sub value chain equipment, , # of organisations



	Design, Assembly, Packaging	Testing	Integration	Application software	Embedded software
Silicon Saxony	10	1	1	9	1
Minalogic	6	5	60	22	8
HTNL	4	1	40	2	4
DSP Valley	15	0	10	6	5
ME2C Austria	8,5	2	11,5	1	0

Figure 10: Sub value chain systems, # of organisations

Based on this regional data, a structured European matrix were developed. One hundred common SWOT indicators have been identified. These have been grouped and ranked according to a common priority by general consensus. This format allows a comparison of the data and an evaluation of the joint strengths and the individual complementarities needed to build a strong cluster cooperation. The 24 high-priority indicators are listed the table below.

SWOT comparision

	Gerneric SWOT parameters derived from the 5 Regional SWOTs	C&C	Priority	Agreement
Knowledge transfer	Asia as upcoming innovator	Threat	1	Action in JAP and WP4
Smart Specialisation Strategies	national in practice	Strength	1	Action in JAP
	regional in practice	Strength	1	Action in JAP
Economic development policies	regional financial support to Smart Specialisation	Compl	1	Part of JAP commitment of authorities
Evaluation of European and international context	involvement in KET Pilot lines	Compl	1	Action in JAP
	participation of SMEs in Horizon 2020	Opport	1	Action in JAP
	exports of SMEs products	Compl	1	Action in JAP
Technology	power electronics	Compl	1	Action in JAP
Market	international orientation	Strength	1	Action in JAP
	global competition	Compl	1	Action in WP4
	energy efficiency	Compl	1	Action in JAP
Knowledge transfer	knowledge transfer infrastructure	Compl	1,2	Action in JAP
Economic development policies	regional financial RDI-support	Compl	1,2	Part of JAP commitment of authorities
Evaluation of European and international context	Participation of SMEs in CATRENE projects	Compl	1,2	Action in JAP
	Strategic cooperations with foreign clusters	Compl	1,2	Action in JAP
	International visibility of the cluster	Compl	1,2	Action in JAP
	competition from Asia and US	Threat	1,2	Action in JAP
Technology	450 mm	Compl	1,2	Action in JAP
Human Capital	internationalisation	Compl	1,2	Action in WP4
Market	market pull	Compl	1,2	Action in JAP
business creation	SME creation, start ups	Compl	1,2	Action in JAP
Knowledge transfer	application platforms	Compl	1,4	Action in JAP
Cluster policies/initiatives	cluster role in developping PMCs	Compl	1,4	Action in JAP
Technology	More than Moore	Compl	1,4	Action in JAP

Figure 11: Consolidation for the commonalities and complementarities with high priority

The results of the report **D2.3 Complementarities analysis** as well of D2.1 and D2.3 are the basis for phase 2, the development of a Joint Action Plan and internationalisation strategy.

3.2.2 Joint Action Plan

In **phase 2 (WP 3)** the Joint Action Plan (JAP) was developed. It describes the strategy to realise the objectives as have been defined for the Silicon Europe meta-cluster together with a concrete implementation roadmap for 2016 – 2018.

Based on the analysis of the commonalities and complementarities the starting point for developing a joint action plan was the list of 24 high priority actions. These actions has been further analysed by the cluster organisations with the support of appropriate cluster members. Several meetings with regional stakeholders have been arranged to gain insight in the needs and wishes of the regional actors and to validate the finding of WP 2. A further reduction of action items has been made towards a manageable number of JAP elements. 14 action items were selected and described in detail in so-called “fiches”, a kind of preliminary project outlines.

1. Initiate involvement in KET pilot lines
2. Facilitate matchmaking for smart specialisation
3. Regional and European support for economic development activities
4. Availability of technologies for electronics for efficient and future power applications
5. Increase the international visibility of the cluster
6. Regional and European support for the internationalisation strategies
7. Initiate participation of SMEs in Horizon 2020
8. Initiate participation of SMEs in JTIs (ECSEL)
9. Initiate strategic cooperation with foreign clusters
10. Focus on markets related to energy efficiency
11. Facilitate knowledge transfer
12. Detect market opportunities outside the regional markets
13. Open foreign markets for SMEs
14. Support to the development of essential technologies

Out of these 14 action items six project outlines have been defined and presented to regional and international experts for feedback.

1. Create a European MNE meta-cluster
2. Technology & knowledge
    a. Make sure the required key technologies within the MNE field are available and when relevant also producible in Europe
    b. Make the state of the art knowledge and know-how, both on technological and economic/business levels, available to the companies of the different clusters
3. Implement the smart specialization strategy
4. Bridge the gap between SMEs and funding instruments

5. Increase the business opportunities for the companies belonging to the cluster(s) by international business development
6. Promote the MNE technology to both the public and the politics

Projects 2 to 6 cover the full scope of the activities needed: financial support, market, technology and knowledge, smart specialisation and communication all bound together through the product value chain. The first project outline, the creation of a European MNE meta-cluster, is necessary to enable the execution of the different projects in a sustainable cooperation mode between the leading clusters

For the final Joint Action Plan **five strategic themes** have been selected.

1. **Knowledge and technology transfer**

   Clusters support exchange throughout Europe

   Within this theme, Silicon Europe will mainly take charge of the following activities:
   - Technology market fairs where targeted markets will be brought into contact with MNE developers to align their respective roadmaps and also to set-up collaborations
   - Mapping of the knowledge and technology sources
   - Organisation of academic colloquia with a low threshold level for the industry
   - Support of a human capital actions addressing mobility, education, training, and most importantly
   - promoting the MNE industry as a challenging and rewarding sector for an excellent career
   - Encouraging and supporting the creation and use by SMEs of platforms as field labs, pilot lines and competence centres

2. **Smart Specialisation**

   R&D along the regional strongholds and markets

   Within this theme, Silicon Europe will mainly take charge of the following activities:
   - Support in the creation and international use of regional field labs
   - Develop new approaches, in order to emphasise on economic transformation and on building interregional value chains
   - Establish a platform for an exchange of experiences and best practices for the implementation of micro- and nanoelectronics based on smart specialisation strategies throughout the Silicon Europe consortium
   - Support the cross-regional cooperation of both ERDF and regionally funded projects, support project consortia to match ERDF funds with H2020 projects or vice versa

3. **SME funding**

   Clusters liaise SMEs to sources of capital

   Within this theme, Silicon Europe will mainly take charge of the following activities:

- Acting as an intermediary between SMEs and different public and private financing opportunities through providing information, networking opportunities and assistance in acquiring the skills needed to access different funds
- Actively contributing to designing SME-friendly funding programmes
- Identification and contacts of accelerators abroad
- Organizing events to attract venture capitalists (VCs)
- Supporting both SMEs and e.g. VCs in judging and appreciating the investment needs and risks

4. **International business development**

   Increase international visibility and consequently detect and create opportunities for the (SME) members

   Within this theme, Silicon Europe will mainly take charge of the following activities:

   - Support electronics companies, and more in particular SMEs, to be present in foreign markets either for business or partnerships:
     - Increasing visibility and attractiveness of the European industry abroad at first in Taiwan and in the US, subsequently in other markets (such as up and coming European regions and outside the EU)
     - Support to the implementation of joint innovation projects
     - Support in scouting possible foreign commercial opportunities for the Silicon Europe partner companies
   - Attract foreign investment money or actors missing in Europe's value chain

5. **Promotion of micro- and nanoelectronics**

   Communicate at large the indispensable role in to-day´s and future society

   Within this theme, Silicon Europe will mainly take charge of the following activities:

   - Initiating case-studies showing the essential role of MNE, promoting MNE in the whole value chain linked with application and narrated in an accessible way
   - Initiating MNE companies to explain the technologies and their value to a broad audience
   - Communicating on the strengths of the European MNE industry in Europe and abroad

3.2.3 Internationalisation Strategy

Within **phase 2 (WP 4)**, the Silicon Europe partners have also done a thorough analysis of clusters outside Europe. Taiwan and USA have been clearly identified as the regions with the highest priority. The analysis was supported by a **clusters benchmark of potential interesting competing regions** (**D4.2 "Report on international partners").**

Different lists of tables were created which allowed the Silicon Europe cluster partners to prioritise and rank the most important clusters for future collaboration **(D4.1 "Report on tools for collaboration")**.

- List of European MNE clusters
- List of European application clusters
- List of international clusters
- List of European events
- List of worldwide events

Cluster Name	Country	Contact within cluster	Origin of contact and existing alliances	Priority ranking	Commentaries
MicroTEC Sudwest	D		Smart systems Minalogic signed a MoU Microtechnics Alliance	1	Sax: Automotive; microsystems technology DSP Valley; Complementarity for sensors
Systematic	F Paris	Thierry Louvet	Embedded Systems	1,4	DSP Valley/HTNL: Interest in collaboration for smart systems
MicroNarc	CH		MEMS, SC Minalogic signed a MoU Microtechnics Alliance	1,8	DSP Valley : For Medical Devices
SCS	F PACA	Guillaume Roux	Microelectronics	1,8	
NMI	UK	Paul Jarvie	microelectronics	1,8	
MIDAS	IRL Cork	John Blake		1,8	
Otaniemi Technology hub	FIN	Ari Huczkowski (CEO mktg) Jussi Tuovinen, VP business unit at VTT	ICT, mems, smart systems	2	R&A: best practices as a cluster + geographically interesting
CORALLIA	GR Athens-Patras	Demetris PAPAILIOU d.papailliou@corallia.org		2	

Table 1: List of European European micro-nanoelectronics cluster (extract of D4.1)

Given the results of the WP 2 SWOT consolidation and priorities, it was decided to enlarge this list to include some European application clusters.

NAME of CLUSTER	Country	Name of contact	Contacted by	Domain of application	Commentaries
Automotive Cluster NL	NL	Godfried Puts www.automotivenl.com	Oost NV	Automotive	Sax : Potential application cluster; Automotive
Bayern Innovativ/ Automotive Cluster	D	Dr. Andreas Böhm	Silicon Saxony / SMWA	Application Cluster; cooperation with representatives of automotive manufacturers, suppliers and scientific institutes; Advanced driver assistance systems, E-mobility, Vehicle Safety, Production efficiency and flexibility	Sax: Application Cluster; cooperation with representatives of automotive manufacturers, suppliers and scientific institutes
HealthValley	NL	Marc Kalf	Oost NV	Health Applications 13/3/204 Health Valley event	DSP Valley: Further contacts needed HTNL: applications
Optonet e.V.	D	Dr. Klaus Schindler	Silicon Saxony	Optical Technologies	Sax: Application Cluster; aviation industry cluster, already common projects running
Aerospace Valley	FR South west	Francois Vernieres	MINALOGIC	aeronautics and space	RA: a significant aerospace industry even scattered within the territory Sax: Application Cluster; aviation industry cluster, already aviation projects running
ACstyria	Austria/ Styria	Franz Lückler	ME2C	Mobility: Automotive, Railway, Avionics	Sax: Automotive; microsystems technology
ECO World Styria	Austria/ Styria	Bernhard Puttinger	ME2C	Eco-Technologies: e.g. Energy Efficient Buildings, Photovoltaics, Renewable Energy, other environmental issues	HTNL: smart cities

Table 2: Selected European Application clusters

The next table shows the selected worldwide MNE clusters.

NAME OF CLUSTER	COUNTRY	Contact within cluster	Contacted by	Domain of activity	Commentaries
Silicon valley	USA			Microelectronics originally but now on to bio, renewable energy, IoT etc....	Sax: Opportunities/Best practices Minalogic: where's the entry point? HTNL: chances are small that HTNL will actually engage with Silicon Valley even though it is attractive to do
Tech Valley nanotech	US Albany	Centre for Economic Growth M Tucker M. Liehr	AEPI, Grenoble Silicon Saxony	Semiconductors	Sax: running cooperation activities
Hinshu	TAIWAN	ITRI	MINALOGIC	Semiconductors	R&A: A mission in Autumn planned
Zelenograd cluster	RUS	Vladimir Zaytev General director Moscow city enterprise; Mr. Saizew	MINALOGIC; Silicon Saxony	Semiconductors	R&A: Opportunities/Partnership Sax: for many years running cooperation activities
Triangle Park	US North Carolina	Lee-Ann	Minalogic	Energy, TechMed	R&A: Delegation in Grenoble 09/2014 HTNL: may be of interest to BCS NL in view of their med. Activities

Table 3: Selected worldwide MNE clusters

Clusters with strong entrepreneurship dynamism and high industrial attraction degree	Clusters with strong government support and high international visibility	Clusters with strong government support but lower international visibility and strong ambition to be a R&D hub	Small clusters recently created with strong government support and strong will for international visibility
Silicon Valley	NY Tech Valley	Eco World Styria	MicronArc/AlpICT
Otaniemi	Systematic	Health Valley	Zelenograd
Hsinchu	Aerospace valley	NMI	Optonet
Midas	SCS		
Bayern Innovativ			

Table 4: Summary table about types of clusters, Europe and World Wide

To be able to measure the success of the internationalisation of Silicon Europe a list of indicators was created.

Strategic objective	Indicator
Establish effective contacts between Silicon Europe and WW clusters	Number visits to the WW clusters and number of WW delegations coming to SE locations
Best practices transferred to other WW clusters	Number of transferred best practices to other WW cluster
International strategy: organisation of international events by Silicon Europe clusters	Number of international events organised by the cluster Number of WW clusters represented in these events
Establish official collaboration with WW clusters	Memorandum of Understanding (MOUs) signed Number of actions/activities with involvement of EU and WW cluster.
International strategy: help Silicon Europe cluster member companies to address WW market in WW clusters	Presence of subsidiaries of Silicon Europe cluster member companies in the WW cluster
International strategy: Promote the Silicon Europe clusters in WW clusters	Presence of official representation of Silicon Europe cluster in WW cluster. Ex official office of Silicon Saxony in NY Tech Valley, or official representation of Minalogic in Silicon Valley (hypothetical…) Number of companies from SE regions visiting events organised by WW clusters.
International strategy: attract WW clusters & members into Europe	Presence of official representation of WW cluster members into Silicon Europe clusters. Ex official representation of ITRI from Taiwan in high Tech NL Number of WW companies (from WW clusters) visiting events organised in one of the Silicon Europe regions.

Table 5: List of indicators

An internationalisation plan for the regions and countries beyond Europe was defined. Main activities are exploration, matchmaking and communication. Taiwan has been chosen as the first country to approach.

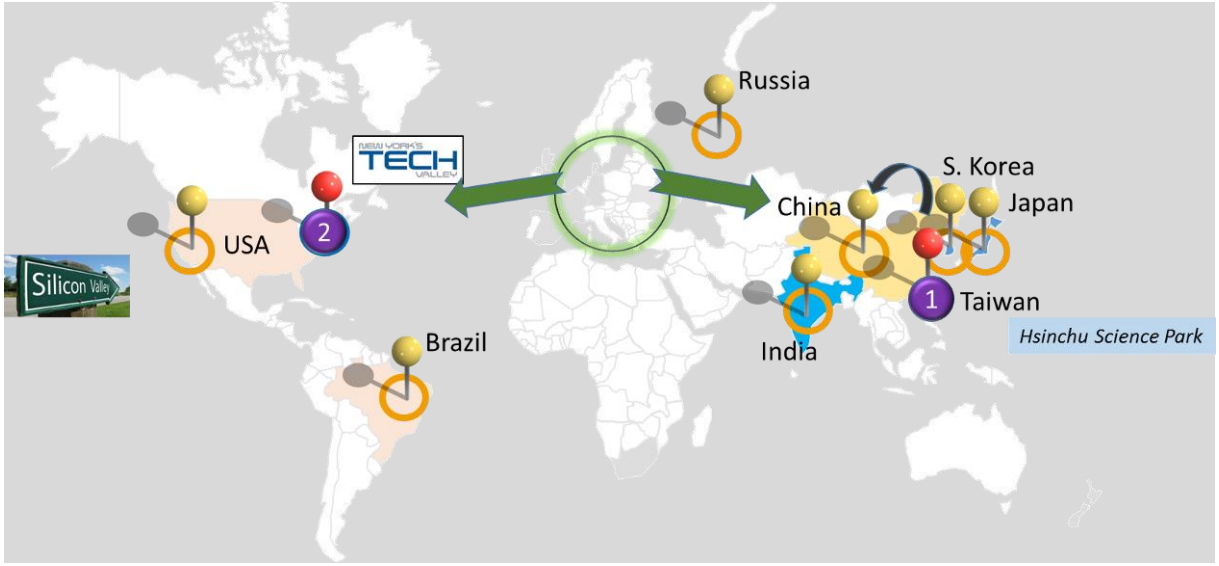


Figure 12: Overview of interesting regions

The deliverable **D4.3** shows how cluster members will be supported in their international action, both within and outside Europe, to increase their activities, to develop business relationships, to attract financing and to continue to innovate. The Silicon Europe partnership has established a recognisable brand, by using the critical mass that the meta-cluster represents, to increase visibility of the European MNE industry in their actions abroad and to global attract key player to come to Europe to exercise their activities.

Mission to Taiwan

Taiwan has been selected as one of the priority regions outside of Europe as part of the Silicon Europe internationalisation strategy. Several activities to explore and further develop the relation between Europe and Taiwan have been defined as part of this strategy.

SEMICON Taiwan 2014

First annual Silicon Europe Taiwan Day, September 4, 2014 in Taipei

The European Economic and Trade Office (EETO), together with the European Business Regulatory Cooperation (EBRC) hosted a field of distinguished micro- and nanoelectronics experts from the European Commission and Members States at its first annual **Silicon Europe Taiwan Day**. The half-day event on the theme "Enhancing transnational and cross-continental innovation", attended by around 110 representatives of European and Taiwanese industry and research entities, showcased insights on European excellence in the fields of micro- and nanoelectronics, presented European competitive clusters' know-how, experience and innovations, such as "Silicon Europe", as well as offered opportunities for direct B2B matchmaking. The forum was part of the EU's efforts to enhance EU-Taiwan cooperation aimed at paving the way for sustainable engagement and cooperation between Europe and Taiwan. The experts shared presentations on the value of clusters in fostering innovation as well as research and innovation related to electronic components and systems in Europe and the strengths of European microelectronics.

The partners of the European clusters alliance Silicon Europe shared their expertise in disruptive innovation and technological development, cooperation within individual clusters and with European clusters, and called for international cooperation with Taiwan. The experts delivered a clear message that cooperation between industry, academia and administrations has been a key enabler in enhancing successful IT and micro- and nanoelectronics clusters in Europe. The European ecosystem for innovation is expected to be a good example for the development of Taiwanese high-tech clusters and future EU-Taiwan cooperation.

SEMICON Taiwan 2015

Fact Finding Mission & Silicon Europe – EBRC Workshop, September 1-3, 2015 in Taipei

From September 1-3, 2015, a Silicon Europe delegation visited Taiwan again. In addition to attending the Semicon Taiwan event, this mission proved to be the opportunity for the Silicon Europe

delegation to meet representatives of the Ministry of Science and Technology (MOST), the Ministry of Economic Affairs (MOEA), several departments of the Industrial Technology and Research institute (ITRI), the Taiwan Semiconductor Association (TSIA) and the European Chamber of Commerce in Taiwan.

In collaboration with the EBRC (European Business and Regulatory Program), a workshop was organised during the Semicon Taiwan conference on the theme "Internet of Things as a driver for Semiconductors: beyond Moore". Speakers from the different Silicon Europe countries gave presentations in front of a Taiwanese audience. The half-day event, which was attended by 70 people, brought together key industrial and institutional micro- and nanoelectronics players from Europe and Taiwan to share insights in the fields of micro- and nanoelectronics, present know-how, experience and innovations realized through industry clusters as well as to offer opportunities for direct business to business (B2B) matchmaking.

The Silicon Europe Alliance was explained and promoted. Several useful contacts were established and agreements for follow up have been made. As a result, matchmaking events for companies will be organised in Taiwan in 2016.

2nd Indo-German SME Forum in New Delhi, September 22-23, 2014 in New Dehli

The forum was about "cluster internationalisation" and provided a platform to foster linkages between public authorities, clusters, industry and other service providers from India and Germany. During this event, the Silicon Europe project was presented and looked for potential collaboration within the Silicon Europe context. Based on the knowledge we have gained through this event, India will have no priority for the internationalization strategy at this stage.

Implementation of the third country internationalisation strategy

The Silicon Europe partners used the opportunity of the call COS-CLUSTER_2014-3-03 – Cluster got international to submit a proposal with two other clusters in Greece and Italy. The proposal **ESCiP "European Semiconductor Cluster Internationalisation Project"** was accepted and will continue the collaboration with Taiwan. Besides Taiwan the US has been also selected as one of the priority regions outside of Europe.

Actions with other European MNE clusters

Since October 2011, twelve European Semiconductor Cluster organisations meet twice a year to share information and experiences from each cluster and to develop joint initiatives for cooperation.

- ME2C, FEEI (Austria)
- DSP Valley (Belgium)
- Minalogic, ARCSIS (France)
- Silicon Saxony (Germany)
- Corallia mi-Cluster (Greece)

- MIDAS (Ireland)
- Fondazione Distretto Green & High Tech Monza Brianza (Italy)
- High Tech NL, BCS (The Netherlands)
- NMI (UK)

As a complement to the Silicon Europe project, the **European Semiconductor Cluster Forum (ESCF)** improves the contacts between the European MNE clusters. The Silicon Europe cluster is the future of this Forum. In October 2015, four other clusters of this Forum joined the Silicon Europe Alliance, thus 10 MNE clusters of the ESCF are members of the Silicon Europe Alliance.

Joint Silicon Europe booth presentations

To promote Silicon Europe and the European micro- and nanoelectronics industry abroad joint booths at international fairs were organised. The Silicon Europe project was presented on the booth of Silicon Saxony during Semicon Europa in Dresden in October 2013. During the High-Tech Systems Conference in Den Bosch in May 2014, Silicon Europe was also present with a booth. Communication tools such as poster materials, as well as a "**commercial and marketing flyer**" were realised. This flyer, completed in April 2014, is dedicated to show a strong and comprehensive image of the European micro-and nanoelectronic industry outside the European border.

The Silicon Europe project was also shown, e. g. on the booth of Minalogic and Silicon Saxony during **Semicon Europa** in Grenoble in October 2014, on the booth of Silicon Saxony during Semicon Europa in Dresden in October 2015 and on the European pavilion during Semicon West in San Francisco in July 2014/15.

For improving links between the cluster members and for increasing partnership opportunities **Silicon Europe cluster´ flagship events were opened to members from other clusters**, e. g. DSP Valley Smart Systems Industry Summit in October 2014/15 or Silicon Saxony Day in July 2014/15.

3.2.4 Accompanying measures

In **phase 3 (WP 5)**, accompanying measures took place in order to facilitate the implementation of the Joint Action Plan.

DSP Valley has developed the **financial plan** to support the execution of the Joint Action Plan. It has resulted in a directory of the local, regional, national and European funding sources and other support on themes addressed by the Silicon Europe Joint Action Plan **(D5.1)**.

Several initiatives have been taken to propose new projects. Concrete opportunities have been pursued and project proposals have been written: e.g. **COS-WP2014-4-05 - Erasmus for Young Entrepreneurs and COS-CLUSTER-2014-3-03 – Cluster Go International**.

In addition to the search for funding opportunities for Silicon Europe activities, the Silicon Europe partners are also contributing to pre-existing or new funding programmes in the role of an interface for SMEs. Silicon Europe was instrumental in **supporting PENTA**, a recently endorsed Eureka Cluster that will replace CATRENE as a funding programme, capitalising on its strengths and offering remedies to its identified weaknesses (not least an insufficient SME involvement). The first PENTA call for

project proposals is expected to open in first quarter 2016. Initially, the Cluster is scheduled to run for 5 years. Silicon Europe will contribute to **ensuring a real SME involvement** in the new programme through a Europe wide dissemination of the calls and to the creation of the aforementioned "market place'.

The successful implementation of the JAP will strongly depend on the mutual trust and willingness of the different cluster organisations to cooperate and implement the different actions but also on the trust of the cluster members in the proposed cross-regional activities. The best way to build trust among organisations is to gradually start implementing parts of an action plan. People will get to learn each other and each other´s organisation. Silicon Europe started with the implementation of some activities like opening up of regional events towards the members of the other clusters organisations or common presence on relevant international fairs.

An overview of initiatives have been taken to **propose new projects** and **trust building activities** is given in **D5.2**.

Date	Organiser	Location	Topic
May 7-8, 2014	High Tech NL	Den Bosch	High Tech Systems Conference, Silicon Europe stand presentation
Jun 12, 2014	DSP Valley	Leuven	B2B Forum
July 3, 2014	Silicon Saxony	Dresden	Silicon Saxony Day and B2B, Silicon Europe booth
Oct 13, 2014	DSP Valley	Mechelen	Smart Systems Industry Summit
Dec 3, 2014	Minalogic	Grenoble	B2B
Jun 12, 2015	DSP Valley	Leuven	B2B Forum
Jul 7, 2015	Silicon Saxony	Dresden	Silicon Saxony Day and B2B, Silicon Europe booth
Oct 20, 2015	DSP Valley	Mechelen	Smart Systems Industry Summit

Table 6: Regional events opened towards the members of the other cluster organisations

Date	Event	Location	Topic
May 7-8, 2014	High Tech Systems	Den Bosch	Silicon Europe booth
Jul 8-10, 2014	Semicon West 2014	San Francisco	Silicon Europe booth
Sep 3-5, 2014	Semicon Taiwan 2014 http://www.semicontaiwan.org/en/node/2671	Taipei	Workshop in cooperation with ECCT Silicon Europe booth
Oct 7-9, 2014	Semicon Europe 2014	Grenoble	Silicon Europe booth, Matchmaking breakfast
Dec 3-5, 2015	Semicon Japan 2014	Tokyo	Silicon Europe poster
July 14-16, 2015	Semicon West 2015	San Francisco	Silicon Europe poster on European pavilion Meetings with US NY Albany Nanotech Cluster
Sep 3, 2015	Semicon Taiwan 2015 http://www.semicontaiwan.org/Pavilions/EuropePavilion	Taipei	Workshop in cooperation with ECCT
Oct 6-8, 2015	Semicon Europe 2015 http://www.semiconeuropa.org/node/3056	Dresden	Summit & reception, B2B matchmaking event, press conference

Table 7: Common presence on international fairs

In order to be able to implement the actions defined in the JAP, it is important that all people from the participating cluster organisations who will be involved in those actions are well trained. Aspects such as international project management, participating to regional and European calls, internationalisation and joined training sessions should get attention.

On June 30th, 2015, a **training session** has been organised on the subject of **Business in Taiwan**. The trainer was Pascal Viaud, who is the local representative in Taiwan for the Invest in Grenoble/AEPI organisation. Unfortunately, due to unforeseen circumstances, the training had to be cancelled but might be implemented at a more convenient time later on after ending of Silicon Europe project.

On October 8th, 2015, a **training session for cluster management** has been organised on the subject cluster internationalisation and new roles of cluster managements in Dresden during Semicon Europa. This workshop was conducted by Dr. Gerd Meier zu Köcker, Head of European Cluster Observatory Team and main initiator of the European Cluster Excellence Initiative ECEI and founder of ESCA.

Within the COSME call "Cluster Excellence Programme" COS–WP 2014-3-04 a **project proposal** has been worked out **to improve the cluster management excellence** including further training activities of cluster (management) staff. The following topics for training have already been identified: Cluster Economics, Cluster Initiative Screening, Industry Analysis and Segmentation, Value Chain Analysis, Benchmarking and Internationalization of SMEs. The project proposal CLEXIM (Cluster excellence in micro- and nanoelectronic clusters) was submitted in June 2015.

Since October 2010, 12 European Semiconductor Clusters are meeting twice a year for sharing information from their clusters. The **European Semiconductor Cluster Forum (ESCF)** allows for the clusters to exchange details about their activities. It is as such offering a **platform for exchanging best practices, exchanging ideas and learning about MNE outside the own region**.

Staff exchange is also a measure to increase the competence level of people. Already from the start of the project it was decided to mutually invite the staff of the partners in the project to the “flagship” events of each cluster, in order to build-up the cooperation. This created the unique opportunities where the staff exchanged the experiences and learned on the best practices used in each cluster.

Date	Organiser	Location	Topic
Jun 2014	DSP Valley	Leuven	B2B Forum
Dec 2014	Minalogic	Grenoble	B2B
Jul 2014	Silicon Saxony	Dresden	Silicon Saxony Day
Oct 2014	DSP Valley	Mechelen	Smart Systems Industry Summit
Jun 2015	DSP Valley	Leuven	B2B Forum
Jul 2015	Silicon Saxony	Dresden	Silicon Saxony Day
Oct 2015	DSP Valley	Mechelen	Smart Systems Industry Summit

Table 8: Staff exchange related to clusters´ flagship events

The deliverable **D5.3** represents the activities regarding **joint training sessions and recruitment campaigns**.

Companies can only be successful in case they can rely on a sufficient number of competent people. Recruitment activities will be organised on cross-regional level to increase the probability of finding the right people. Each cluster promotes vacancies of their cluster members to the whole of Silicon Europe.

The Silicon Europe partners have ongoing activities on recruitment based on the following activities:

- **On-line vacancies**: e.g. Silicon Europe members can post their vacancies on the cluster websites.
- **Job fairs:** On regional and international level, screening potential candidates and distribute their applications to the cluster members.
- **Workshops:** e.g. organising of workshops for international recruitment with focus on the requirements and modalities to be completed when employing a foreign candidate.

3.2.5 Promotion of visibility of EU clusters and of the utilization of MNE as KET

Communication and dissemination are being implemented throughout all phases of the project (WP 6). The main activities were focused on ensuring a consistent inside and outside project communication and dissemination. At the beginning of the project we set up a **project website (D6.1, www.silicon-europe.eu)** with extensive information about the project and the involved clusters.

All Silicon Europe publications and news were uploaded on the webpage www.silicon-europe.eu and were frequently updated by ourselves. Silicon Europe posted messages via **Twitter** regularly and has established a **LinkedIn** account.

A Silicon Europe **presentation and event schedule (D6.2)** were created and adapted to the current project progress regularly. We also published the **Silicon Europe newsletter (D6.3)** twice a year.

One part of our activities to ensuring a consistent outside project communication and dissemination are **publications on press and other media (D6.4)**.

The publications on press focus on main activities like the start of the project in October 2012, the cluster meeting with the political representatives of the involved regions in February 2013 or the final Silicon Europe activities during Semicon Europa in October 2015. The project duration has been extended by one month as the final project activities have been taken place during Semicon Europa in October 2015.

For dissemination activities, different **communication materials** were prepared like a Silicon Europe brochure, a flyer especially for use beyond Europe, Silicon Europe stickers, Silicon Europe business cards, roll-up banners and the brochure A 5 Step Joint Action Plan. We also created an **image video (D6.5,** https://www.youtube.com/watch?v=3a1ja_ofSMk**)**.

Figure 13: Silicon Europe brochures and flyer

For **successful stakeholder involvement,** the following **dissemination events** were organised by Silicon Europe.

In collaboration with the Saxon Ministry of Education and Research, a **dissemination event with regional political representatives** of the clusters was held in Brussels on **February 20th, 2013**. The political representatives talked on the future of microelectronics as a key enabling technology. Silicon Europe was presented and a joint Silicon Europe position paper was discussed as part of this talk. The **Silicon Europe clusters´ joint statement** was signed by representatives of the regional governments of Rhône-Alpes and Saxony during the follow-up meeting on February 13th, 2014 in Grenoble. It was also endorsed by the regional authorities of Carinthia. Of course, it carries the signatures of all triple helix clusters of Silicon Europe.

Figure 14: Silicon Europe Clusters´ Joint Statement

Successful involvement of European Commission

On **October 1st, 2013** DG Connect, Directorate A unit Components has met with Silicon Europe on the **implementation of the 'European Strategy for micro-and nanoelectronics components and systems** in Brussels. During this meeting Silicon Europe was invited to give their vision and expectations on the European Strategy as presented on May 23rd, 2013 and to put forward their ability to contribute to the implementation of the strategy. The **follow-up workshop** of this meeting took place on November 28th, 2013 in Brussels. The regions of Saxony, Grenoble, the Southern region of Netherlands and the region Flanders made presentation of their approach to smart specialisation, the definition of the Partnership Agreement and in later stage the Operational Plans. DG Connect made a short presentation on the progress of the so-called combination of funding and how this could work in the future to support larger innovation/investment projects with a mix of H2020 and ESIF funds.

Successful involvement of representatives of industry, research and politics

Silicon Europe Policy Workshop on micro- and nanoelectronics and its role as key enabling technology

On **November 5th, 2014**, the partners of the project Silicon Europe discussed at the Saxon Liaison Office Brussels the challenges and opportunities with regards to reindustrialization of Europe that arise from micro- and nanoelectronics and its role as key enabling technology.

Representatives of the European Parliament as well as representatives of industry, research institutes and regional authorities gave an insight into their respective views.

The Semi industry in Europe is of strategic importance – chips are everywhere. MNE is essential for European leadership in future and emerging markets worldwide and is the enabler for all key areas such as mobility, health, energy efficiency, security and convenience. MNE is the enabler for “Smart Anything”.

Even though Europe is acting already, e.g. ECSEL program, the investments need to be accelerated and intensified to retain and increase the global competitiveness of MNE to compete with countries like China and US which have a huge programme of investment in MNE. In this respect, it was appealed mainly to economic players to have the courage to invest in MNE. The European industry needs visionaries to establish new big global players made in Europe.

With regards to the European strategy for Key Enabling Technologies it is essential to pursue consequently the approach already taken by the European Commission.

Besides investments in new development projects and pilot lines it is also important to make targeted investments in new talents as they are the workers of the future in modern fabs. In this context research institutes play an important role.

Figure 15: Impressions of Silicon Europe policy workshop

Final Silicon Europe project activities during Semicon Europa 2015 in Dresden

The final Silicon Europe conference in October 2015 consist of different activities:

- Final Steering Committee Meeting, Oct 5
- Press conference, Oct 6
- 9th European Semiconductor Cluster Forum (ESCF), Oct 6
- Public workshop, Oct 7
- VIP guided tours, Oct 6+7
- Taste of Silicon Europe booth event, Oct 7
- B2B matchmaking, Oct 6-8

Final Steering Committee Meeting, October 5th, 2015

During the Steering Committee Meeting, the Silicon Europe project was reviewed. Under the brand of Silicon Europe, the partnership will be continued after the end of the funded period of the project. Six new cluster members were approved and the new board was elected for the first two years (2016/2017). The new board consists of the Chairman Peter Simkens (DSP Valley) and the Vice-Chairwoman Isabelle Guillaume (Minalogic). According to the statute of the new Silicon Europe Alliance Peter Simkens and Isabelle Guillaume will switch their roles for the second year.

Silicon Europe press conference, October 6th, 2015

Press release: http://www.silicon-europe.eu/files/2015/10/MI_0215_SE_Press-release_6-Oct-2015_ENG.pdf

During the press conference, the Silicon Europe partners announced continuation of their collaboration after the end of the project, deepening and enlarging it into the **Silicon Europe Alliance.** Another six European clusters have joined the Silicon Europe Alliance. The cluster partners presented the step-by-step strategy for the time till 2018 ("Joining Forces for European Leadership for Innovative Electronics – A 5 Step Joint Action Plan") to the media.

Figure 16: Impressions of Silicon Europe press conference on October 6th, 2015

9th European Semiconductor Cluster Forum (ESCF), October 6th, 2015

The current status of the Silicon Europe project, vision and future activities were discussed within the participating clusters. The decision was taken to combine ESCF with Silicon Europe due to the large overlap regarding the member basis, which was nearly the same after joining of the six new MNE clusters to Silicon Europe Alliance.

Public workshop, October 7th, 2015

"Workshop on the Role of the European Clusters and Regions in Electronic Components and Systems"

The workshop aimed to take stock, exchange views and consolidate relations with the relevant stakeholders. The workshop also discussed possible next steps which may include the organisation in 2016 of a high level meeting.

Reaching out to regions and clusters is part of the Industrial Strategy for the Electronics Industry in Europe. The workshop was built on ongoing initiatives in particular Silicon Europe and the European Semiconductor Cluster Forum (ESCF). Furthermore, it used the results of the smart specialisation workshop held in 2014 in Villach (Austria) and of the workshop held on April 29th, 2015 with the RTO's in Brussels.

The workshop intended to respond to the stronger need for cooperation and coordination, networking and strengthening the eco-system with specific emphasis on the role of regions and clusters. In particular, the access to finance (including EFSI and ESIF) and smart specialisation were featured on the agenda.

At the workshop, Silicon Europe presented its Joint Action Plan and the impact achieved so far already. More than 50 participants attended the workshop.

The event was web streamed to follow it live (http://www.silicon-europe.eu/events/workshop-europaen-clusters**).**

The organisation of the workshop was done by DG CONNECT and Silicon Europe. The outcome is an action paper prepared by DG CONNECT. **Recommendations** for different levels are outlined in this paper.

Recommendation 1 – Internationalisation

- Europe should acquire better hands-on knowledge of Asian markets, which often drive demand and supply – accessing such markets is essential for the health of the European industry.
  (Recommendation applicable to the European level)
- Europe should increase the visibility of the European electronic components and systems industry internationally, for example in Taiwan and the USA.
  (Recommendation applicable to National and Regional levels)
- Europe needs to support the internationalisation of SMEs.
  (Recommendation applicable to National and Regional levels)
- Europe should take advantage of our attractive innovation and cluster environment to attract talents and start-ups from elsewhere including Asia to Europe, leading to a more balanced collaboration.
  (Recommendation applicable to National and Regional levels)

Recommendation 2 – Identifying and exploiting commercial and application/product opportunities

- Clarify the mapping of regional smart specialisation expertise, as carried out in the Eye@RIS3 mapping exercise, and introduce an application areas focus within regional smart specialisation strategies.
  (Recommendation applicable to the European and Regional levels)
- Exploit the innovation expertise within existing cluster organisations, such as the Silicon Europe Alliance, to work with the regions to identify attractive commercial and product/applications development opportunities.
  (Recommendation applicable to the Regional level)

Recommendation 3 – Financial support and state aid

- Prioritise the development of an IPCEI suited to effective exploitation and support of Europe's micro- and nanoelectronics expertise and industrial infrastructure.
  (Recommendation applicable to the European, National and Regional levels)

Figure 17: Impressions of final public workshop

The proceedings of public workshop are summarised in **D6.6.**

VIP guided tours, October 6+7th, 2015

Silicon Europe together with the City of Dresden organised two guided tours at Semicon Europa including a meeting with new Semi Europe President Laith Altimime. The representatives of the regions visited among others the Alleé de Cluster and selected Silicon Europe member companies. The Lord Mayor City of Dresden hosted a joint Public Authority Lunch with the following agenda points: Silicon Europe Alliance and Joint Action Plan, EU Project ESCIP and common potential activities.

Taste of Silicon Europe booth event, October 7th, 2015

The joint Silicon Europe event took place at the Allée des Clusters. Invited were all visitors and exhibitors of Semicon Europa to come to the Allée des Clusters. The whole Silicon Europe consortium and cluster members were represented. All clusters sponsored this event with regional food and beverages. For dissemination glasses with the Silicon Europe brand were created.

B2B matchmaking, October 6-8th, 2015

The organisation of the B2B matchmaking event was organized by Enterprise Europe Network (EEN) and Silicon Europe (https://www.b2match.eu/Semiconeu2015). In total 100 meetings have been arranged with participants from 22 countries.

Further dissemination events and booths presentations

Silicon Europe presentations were given at various events. Some examples of dissemination events are, e.g.:

- European Semiconductor Cluster Forum (ESCF) twice a year
- Silicon Europe session at DATE Conference in Grenoble, March 2013
- Silicon Europe presentation at INC9 Conference in Berlin, May 2013
- Silicon Europe European Commission Tour, March 2015
- Semicon Japan in Tokyo, December 2014
- Smart Specialisation Conference in Villach, May 2014
- Catrene Workshop in Grenoble, June 2014
- Launch of the European Smart Anything Everywhere Initiative in Grenoble, March 2015
- European Conference On Digital And Key Enabling Technologies Skills, June 2015

Silicon Europe booth has been organised at the following events, e.g.

- High Tech Systems Conference in Den Bosch, May 2014 and March 2015
- Silicon Saxony Day in Dresden, July 2014 and 2015
- Semicon Europa, Oct 2014 in Grenoble and Oct 2012/2013 /2015 in Dresden
- Smart Systems Industry Summit in Mechelen, Oct 2013, 2014 and 2015

A **strong Silicon Europe brand** was created within the project. It is the brand under which the leading micro- and nanoelectronics clusters in Europe collaborate to represent, support and promote the companies and organisations belonging to their eco-system both on European and global level. The brand was registered in the trademark register in August 2015.

3.2.6 Definition of a European meta-cluster for MNE

A **strong Silicon Europe brand** was created within the project. It is the brand under which the leading micro- and nanoelectronics clusters in Europe collaborate to represent, support and promote the companies and organisations belonging to their eco-system both on European and global level. The brand was registered in the trademark register in August 2015.

Figure 18: Silicon Europe brand

The story line from the beginning of the project "Silicon Europe – The leaders for energy efficient ICT" was changed in "Silicon Europe – The leaders for innovative electronics". After several discussions with the consortium, the decision was made to leave the narrow focus to address a wider technological field.

A joint vision mission statement was agreed by all partners.

Objectives of the meta-cluster:

The Silicon Europe Vision
• Silicon Europe unites the leading European micro- and nanoelectronic clusters and creates transnational business and innovation opportunities between all cluster members and towards applications enabled by micro- and nanoelectronics. • Silicon Europe is the globally recognised brand for cutting-edge micro- and nanolelectronics in Europe. • Silicon Europe is the recognised voice of the SMEs in the area of micro- and nanoelectronics in Europe.

Figure 19: Vision of Silicon Europe

The Silicon Europe Mission Statement
We, as the Silicon Europe partner clusters, are committed to actively cooperate transnationally in order to create value for our members: • To facilitate the transnational transfer of knowledge and technologies between the cluster members and promote available R&D results for better commercial use. • To help to make cutting-edge micro- and nanoelectronics competences and technologies visible inside and outside Europe and facilitate their application into various markets. • To encourage and support SMEs to participate in European projects and to access other sources of public and private financing. • To explore and promote international market opportunities and enable international matchmaking, both within and outside Europe. • To use the Silicon Europe brand to promote European micro- and nanoelectronics competences and its importance within and beyond Europe and provide a central contact point for potential partners and investors.

Figure 20: Mission statement of Silicon Europe

The Silicon Europe partners have set up a Statute for a formal cooperation under the brand of Silicon Europe after the end of the funded period of the project. This also includes an opening towards clusters beyond the initial project partnership.

The new Silicon Europe Alliance, the continuation of the strong cooperation beyond the timeframe of the project, was announced at the Silicon Europe press conference during Semicon Europa in Dresden in October 2015.

The new board of the alliance consists of the Chairman Peter Simkens (DSP Valley) and the Vice-Chairwoman Isabelle Guillaume (Minalogic). According to the statute of the new Silicon Europe Alliance Peter Simkens and Isabelle Guillaume will switch their roles for the second year. The partners of the Silicon Europe Alliance are committed to implement the agreed Joint Action Plan by signing the **Silicon Europe Statute**.

3.2.7 Enlarging the Silicon Europe partnership

One main focus of the project was to enlarge the basis, both geographically and technologically. Already during the timeframe of the project two further clusters have joined the project as **associated partners**.

- Business Cluster Semiconductors (BSC), The Netherlands
- ME2C, Austria

The associated partners have contributed to all phases of the project, but without getting any money from the grant.

From 2012 to 2015, the **number of members** from the participating clusters has also increased.

Cluster	# of members 2012	# of members 2015	Growths
High Tech NL	170	230	+35%
DSP Valley	75	116	+54%
Minalogic	204	300	+47%
Silicon Saxony	297	322	+8%

Table 9: Growths number of members from the clusters

The cross-regional cooperation will be continued after the end of the funded period. **Six new cluster members** have joined the Silicon Europe Alliance in October 2015.

- Distretto Green & High Tech (Italy)
- MIDAS (Ireland)
- GAIA (Spain)
- NMI (UK)
- mi-Cluster (Greece)
- SCS Cluster (France)

Now the Silicon Europe Alliance unites 12 European micro- and nanoelectronics clusters with about 2,000 cluster partners.

Two of new cluster members (Greece, Italy) are already partners of the project "ESCiP "European Semiconductor Cluster Internationalisation Project".

3.2.8 Initialisation of business at member level

Besides the partners of Silicon Europe, the members of the participating clusters have also benefited from the Silicon Europe project as shown in the following examples.

Sofics (Belgium)

Sofics has developed new business thanks to exhibition participation with DSP Valley. Bart Keppens, Marketing Director Sofics: "Sofics joined the DSP Valley delegation for the 2014 Silicon Saxony Day, the annual meeting point for the high-tech industry, science, research and public institutions of Saxony. During the event we discussed a cooperation with Creative Chips (locations in Bingen and Dresden) for an ASIC development in advanced CMOS technology. This has led to a real contract 1.5 month after the Silicon Saxony Day. Sofics delivered customized on-Chip ESD protection clamps. A new cooperation is currently being discussed for an automotive electronics application."

Dolphin-Integration (France)

Jean-François POLLET | VP Business Development: **"**Dolphin participated in the B2B event organized by DSP Valley in June 2015, alongside 3 other Minalogic companies. The outcome of this participation was positive. We found a partner whose expertise was complementary to ours, and jointly submitted a bid for a call for tender which we won! The whole thing happened very quickly after our encounter that day. It is a small project but small streams become great driver! We also met a potentially interesting Dutch partner. We do enjoy these B2B events."

SOITEC (France)

Nelly Kernevez | Partnership director: **"**Thanks to Silicon Europe, SOITEC:

- promoted its SOI technologies at an event organized by Silicon Europe in Brussels in November 2014 with key policy-makers.
- was able to organize with the SOI consortium[1] a SOI workshop at the Silicon Saxony Day in Dresden in July 2015 which gathered 50 participants interested by the high level panellists composed of representatives of the industry (IFX,ST, GF, NXP), universities (UCL) and the European Commission (ECSEL).

These events allowed us to highlight the strong competitive advantage that SOI represents for the European microelectronics' industry and its innovative applications (automotive, lightning, consumer…). It was all the more important in the context of GLOBALFOUNDRIES' engagement in FDSOI22, to explain the importance that the technology has for industry in Europe."

[1] The SOI Industry Consortium is a group of leading companies from the electronics industry with the mission of accelerating silicon-on insulator (SOI) innovation into broad markets by promoting the benefits of SOI technology and reducing the barriers to adoption. More information at http://www.soiconsortium.org/about-us/mission-goals-benefits.php

3.3 Success indicators

Within the specific objectives of Silicon Europe (see chapter 2), the following success indicators were defined.

To 1) **Promotion of micro- and nanoelectronics**

Success indicators (target figures):

- Number of visitors of web platform(s) (including web 2.0 components) (100.000): achieved **31019**
- Number of articles in various media (newspapers, CORDIS, etc.) (50): achieved **39**

To 2) **Securing European know-how for Europe**

Success indicators (target figures):

- Number of defined common research topics between the clusters to work on (synergies) (15): achieved **18**
  - Health Care and Ageing Society
  - Energy Efficiency
  - Automotive and Transport
  - Equipment
  - Materials and Manufacturing
  - Semiconductor Process and Integration
  - Internet of things
  - Design Technologies
  - Process development
  - Communications and Digital Lifestyle
  - embedded sensor technologies for security and safety
  - Electro mobility
  - Smart Systems Integration
  - Agriculture
  - Advanced computing
  - Atomic and Molecular Scale Devices and Systems
  - Robotics, Cognitive Systems & Smart Spaces
  - Fully Depleted Silicon on Insulator technology (FDSOI*)*

- Number of Partnership agreements between institutions from the clusters within the cluster (complementarities/synergies) (20): achieved **Silicon Europe clusters´ joint statement**
  - The clusters and regional representatives signed the Silicon Europe clusters´ joint statement. This joint statement was also agreed with key cluster members and can be also considered as a kind of partnership agreement between institutions.

- Number of common R&D projects initiated (synergies + complementarities) (10): achieved **131**

'Optimistic'

	ENIAC JU	ECSEL	CATRENE*	Eurostars	Celtic -Plus	FP7 - ICT*	H2020 LEIT ICT*	Total
2012	9	/	3	1	0	4	/	17
2013	12	/	6	0	0	55	/	73
2014	/	8	5	0	0	/	28	41
Total	21	8	14	1	0	59	28	**131**

**These figures have to be checked. Indeed, sometimes we do not have enough details on companies to determine whether they are members of a Silicon Europe cluster or not.*

To 3) **Opening up new markets**

Success indicators (target figures):

- Number of partnership agreements between institutions from the clusters and other institutions outside the cluster (5): achieved **6**
  - Zelenograd – Silicon Saxony
  - Zelenograd – Minalogic
  - Minalogic – Taiwan
  - Silicon Europe – BCS NL (associated partner)
  - Silicon Europe – ME2C (associated partner)
  - Silicon Europe - Korea
- Number of publications/presentations under the common identity (10): achieved **68**

4 Potential impact

Micro- and nanoelectronics will make a significant contribution to the successful handling of the mega trends including e.g. climate protection, a society that is shifting from industry to knowledge, the globalisation and optical, energy and environmental technologies. Silicon Europe's efforts in micro- and nanoelectronics significantly contribute to Europe's economic and innovative strength – both in the short and the long term. In the short term, micro- and nanoelectronics help traditional industries to open up new markets and their utilisation will lead to the increase of energy efficiency in all sectors. Furthermore, Silicon Europe completes and strengthens the value chain of Europeans semiconductor eco-system will be a role model for inter-cluster cooperation. Ultimately, the European semiconductor industry will be boosted and thus enabled to take on the Asian and global challenge on the market. The Silicon Europe initiative will raise the awareness of the importance of the European semiconductor industry in the wider public and authorities. The capacity to generate innovations and successfully transfer them to the market is a key skill for Europe. This innovative force is decisive for the competitiveness and therefore ultimately for Europe's sustainability.

4.1 Expected impact from the Joint Action Plan

The Joint Action Plan is the major outcome of the Silicon Europe project. It describes the agreed actions of the Silicon Europe cluster alliance for the next 3 years (2016-2018) resulting in **multiple notable impacts on different levels**.

4.1.1 Impact on cluster level

The successful implementation of the Silicon Europe JAP will have a clear impact on the cluster organisations itself. Specifically, it will lead to an increase of quality in management, mainly by improving their management practices as well as their market/competitive advantages or value-chain analytical capacities and by enabling them to provide top quality services to their SMEs, especially on facilitating SMEs internationalisation, better exploiting and diffusing Key Enabling Technologies (KETs), in particular of course micro- and nanoelectronics.

Consequently, on the level of the cluster itself, i.e. on member level, this will lead to an increase of international collaboration and innovation, both within Europe as well as beyond Europe. It is expected, that at least 40% of all member companies will be engaged in such activities, thereby clearly exceeding the respective benchmark on European level (25%).

4.1.2 Impact on regional level

On the level of the regions involved, the implementation of the JAP will lead to an effective implementation of smart specialisation strategies, in particular by fostering interregional exchange of best practices.

The respective commitment has already be shown by the involved regions by forming the Vanguard initiative. These regions wish to build the synergies and complementarities in smart specialisation strategies to boost world-class clusters and cluster networks, in particular through pilots and large scale demonstrators. These investments will bolster the competitive capacity of Europe to lead in

new industries for the future and develop lead-markets that offer solutions for our common challenges. The impact of Silicon Europe activities will mainly be on the SME level in this regard. Consequently, this will lead to growth of companies and employment in the participating regions. Silicon Europe is well known at local level of the participating clusters and thus able to influence policy. The regional clusters also gained more visibility due to the high level of awareness of the project.

4.1.3 Impact on European level

The implementation of the Silicon Europe activities will have a clear contribution on several technical roadmaps related to micro- and nanoelectronics, but also application areas, such as the ECSEL MASRIA or the VMS (Vision, Mission strategy) documents by EPOSS, ARTEMIS and ENIAC respectively, in particular with regard to the effective and efficient involvement of SMEs in an international project context.

The founders already prove their capacity to contribute to such an ambitious issue by actively supporting the design of a new SME friendly funding programme in the framework of EUREKA (PENTA). The Silicon Europe activities will also have a strong impact on securing proper access to finance for SMEs, both from public as well as private sources. Consequently, activities will also have an impact on participation rate of SMEs in major funding programmes related to innovation such as Horizon2020.

With regard to the implementation plan proposed by the Electronics Leaders Group[3] the Silicon Europe activities will clearly contribute to the facilitation of the creation of the demanded world-class reference zones (4.4) as well as to realisation of the requested network of excellence centres (4.5).

The Silicon Europe partners have already launched cooperation approaches towards different clusters, e.g. in the framework of the Competitiveness and Innovation Framework Programme (CIP). A successful implementation of the JAP will further contribute to successful cross-cluster cooperation's, also using cross-sectoral approaches, thereby fully leveraging the opportunities that arise from micro- and nanoelectronics being a key enabling technology.

Silicon Europe assured recognition at European level for the roles that cluster carry out in terms of acting as intermediary between SMEs, large companies, research institutes and politics.

4.1.4 Impact on global level

Micro- and nanoelectronics are impacting the full European value chain with 30B€ contribution to Europe GDP. MNE is one of the few industries creating jobs, is driving 90% of the innovation, is positioning Europe as worldwide leader in R&D, is networking worldwide leading companies and numerous SME's, is integrating R&D and Manufacturing within clusters and is providing societal solutions via new technologies and applications.

[3] https://ec.europa.eu/digital-agenda/en/news/european-industrial-strategic-roadmap-micro-and-nano-electronic-components-and-systems-0

Silicon Europe activities will first and foremost lead to a further **increase of visibility/attractiveness of Europe as a relevant area for micro- and nanoelectronics,** mainly by forming the critical mass and further increasing and exploiting the brand value of Silicon Europe as such.

This will directly impact the **market valorisation of micro- and nanoelectronics as key enabling technology in traditional industry**. E.g., Semiconductors provide the knowledge and technologies that generate some 10% of global GDP.

Of course micro- and nanoelectronics will be essential for making the Internet of Things (IoT) work as well and, even more important to ensure a leading position of Europe within this field.

Improving energy efficiency is a priority in all decarbonisation scenarios and thus also one of the major challenges with regard to the flagship initiative of 'a resource efficient Europe'. The improvements in R&D in the field of micro- and nanoelectronics, but also the **increased utilisation** as effect of the increased awareness will have a major **impact on energy efficiency**.

In the Silicon Europe cluster, the value chain of micro- and nanoelectronics is extensively represented. All Silicon Europe partners together have strengths along the whole semiconductor value chain. Micro- and nanoelectronics require a close proximity between research, technological development and production. A migration of research and development consequently results in a migration of the production and vice versa. The strong collaboration within Silicon Europe has also an **impact on strengthening and completing the value chain of the Semicon Europe eco-system**.

The availability of a complete European semiconductor value chain is the key factor for an **ability to compete globally**. Without semiconductors, equipment and the know-how regarding material processing for production, none of the traditional or emerging industries such as automotive, aerospace, energy, telecommunication, and medical equipment, will remain competitive in the future. The Silicon Europe cluster will prevent Europe from losing its ability to develop and produce advanced semiconductors. Thus, the risk of producers of competitive technology products with "embedded intelligence" migrating to Asia and the dependence that comes with a foreign supply is reduced. The coordinated actions of all Silicon Europe cluster partners will provide the basis for an application-oriented research and development work with a pan-European focus. This is even more important since not a single European county can cope with the challenges posed by the growing international competition.

Silicon Europe developed a vision of indispensability for the European semiconductor industry. This leads to a significant **improvement of the public awareness of the role of MNE** regarding its economic (Europe´s competitiveness), scientific (securing of the production know-how for KET-relevant technologies) and social (coping with global megatrends) relevance for Europe´s future.

4.1.5 Potential impact on megatrends

Micro- and nanoelectronics is a key enabling technology which permeates through all industry and society as a whole and have a **major impact on nearly every megatrend.** Changes of the global ecosystem have a direct impact and are closely linked to economic, social and technical trends.

1) Impact on biosphere megatrends

Availability of resources

Raw materials, metals and fossil fuels in particular, are the basic elements of our technological live. They are not in unlimited supply on Earth.

Environmental protection, climate protection and sustainability

Global environmental pollution has further increased during the last few years despite all efforts to contain it. Only the rapidly increasing use of information and communication technology (ICT) systems has reached the CO2 emission levels of all combined civil air traffic and the energy costs for operating ICT infrastructures have become a significant financial concern.

2) Impact on social megatrends

Demographic development and social structure

Social structures are breaking up and flexibility and mobility are becoming more significant. The world´s population has been growing at an exponential rat since industrialisation began. The increasing aging of society will be especially noticeable in Europe. The demand for services in wellness, sports and culture will rise in particular. The need for professional care in nursing homes or mobile nursing services will increase significantly. The advancing technologisation and networking of the world means that people without broadband internet access are falling further behind. This phenomenon is called the digital divide and mainly affects consumption, services, communication and culture. The gap between high and low incomes is becoming greater, the number of people with incomes in between is decreasing, are further trends with an need to avoid the digital divide for all of them.

Education, knowledge and work Society is shifting from industry towards knowledge.

The new type of work in the knowledge society is constantly searching for new real and virtual workplaces. Independent creative professionals and knowledge workers who previously worked from home will have joint platforms for networking, innovation and production. They will work with fixed and flexible workstations, wireless LAN, conference and telephone rooms**.**

Urbanisation

In the future, 70% of people will live in cities. The cities must be built in a vertical direction in order to ensure “walkability” – pedestrian friendliness with short distances despite the increased individual space requirement. Also the trend for recentralized cities with minimal distance between work, living accommodation and leisure activities are reducing energy and space consumption, commuter flows and traffic volumes.

Mobility

The importance of mobility will continue to increase. Geographical mobility will remain an important aspect, which will be reflected in the unchanged desire for personal mobility. These will be based on new services and simple ticketing for local public transport that will not only allow smooth transitions within the system, but also easy changes from and to personal transportation systems. The quality of public transportation will be improved with simple and electronic ticketing solutions, real time

information and increased travelling comfort in new, modern vehicles. A shortage of energy will make a physical mobility more and more of a luxury. Information and communication technology provides the required means of exchanging information via the internet. Telepresence and holographic systems which bring business partners together will be part of our normal life.

3) Impact on economic megatrends

Globalisation

The world will become a global village resulting in the formation of a multipolar world order and new international organizations. This takes place across national borders in a global economy managed with modern information and communication technology. This strong, technological world has a great thirst for energy.

Markets, customers and consumption

Consumption will be influenced by three trends in the coming years: The developing countries share in prosperity, the growing demands for luxury, particularly in the boom countries China, India, Russia and Brazil, and sustained consumption in the West. These trends will result in the development of new consumer markets with rapid distribution of product ranges and high growth rates in emerging markets. The time of mass production is over in the old world with its extremely well developed markets. The development here is toward individual products, specific services and high level of diversification. In shops, all product information will be stored on electronic labels, so that customers only have to pass an electronic barrier with their shopping cart and pay with card. Capturing, tracking and analysing of information in the supply chain are direct linked with efficient information and communication systems.

4) Impact on technological megatrends

Medicine and health

The divisions between individual scientific and technical disciplines are becoming increasingly blurred. New processes, products and systems with improved characteristics and functions can be created by combining different disciplines. Medical developments are characterized by a high level of technologisation with the aim of developing new diagnostic methods and therapies, optimizing health care for any aging population, and reducing costs. Electronic health cards with an intelligent information technology will be the basis for modern medicine monitoring.

Optical technologies

Next generation optical technologies like future generations of computer chips, transmission of extremely large data volumes via fiber optic cables and even display technology in everyday life and consumer electronics are strongly linked to micro- and nanoelectronic. All these modern and next generation OLED, organic LED displays, active displays in cell phones are driven by micro- and nanoelectronic devices.

Energy and environmental technology

One of the greatest challenges is the coverage of global energy requirements while preserving the environment. The use of solar energy supplemented effectively by other regenerative energies, along

with hydropower, biomass and geothermal energy, wind power promises the highest growth rates. To manage this energies in order to serve the energy demand in real time, challenges the development of so called smart grids. These smart grids will be controlled and managed by monitoring systems, based on software and micro- and nanoelectronics.

Manufacturing and process technology

High quality, low costs, the ability to manufacture customer specific products while preserving the environment. A main focus in industrial manufacturing and process technology is energy efficiency. One of the hand, energy efficiency can directly reduce costs. On the other hand, efficient and environmentally-friendly measures are a quality feature especially in the energy-intensive manufacturing sector that can be marketed well against the background of current discussions on environmental protection. The future goals like the robotic sector, the man-machine interface, the collaboration between humans and machines as “colleagues”, the “digital factory”, the electronic systems, optics and sensors needed for the optimization of manufacturing processes are using modern information technology and micro- and nanoelectronics.

Digitalisation

An important aspect of digitalisation being worked on is data storage. Future data storages could be a combination of micro- and nanoelectronic technologies with durable storage media such as crystals, a combination of laser and microfilming or holography.

Information and communication technology

In the future, humans will talk to humans and objects, and objects will even talk with objects. In fact, objects are becoming ever more intelligent and can interlink with each other. The goal is to publish and share knowledge within a company so that all employees can be involved to a larger degree. This leads to increase transparency, commitment, responsibility and satisfaction. At the same time, efficiency can be increased since colleagues can contribute information and ideas that nobody would have thought of. Other trends will be remote control households via the internet, cars will exchange information with cars or the environment, 3-D television, smart textiles and quantum cryptography to secure the continuously increasing data flows. This future communication will be mainly realised with electronic mobile communication equipment based on micro- and nanoelectronic units.

Integrated, miniaturized systems

In the future, computers will enter every sphere of life. This development is described as pervasive computing. The basis for pervasive computing is the miniaturization of micro- and nanoelectronic components such as processors and sensors. These embedded systems can interlink and communicate with each other or communicate with humans. A major benefit of all these integrated systems is that they operate invisibly and unnoticeably and thus improve comfort, safety, health and therefore the quality of life of users.

4.1.6 Benefits for stakeholders

The benefits, or impact of the various activities by Silicon Europe will influence many different “stakeholders” and each stakeholder will be affected in a different way.

The most obvious stakeholder is of course the group of businesses, in particular the SMEs, in the combined clusters. They will gain **easier access to knowledge and technology** that previously was difficult to access combined with access to key infrastructures in the Silicon Europe regions, e.g. pilot plants, living labs, field labs etc.. Due to the enlarged meta-size of the cluster collaboration, new markets will be available and many more potential partners are at hand. A significantly raised profile will further contribute to **easier establishment of business contacts**. A strong focus will be put on bringing large groups closer to new SMEs and targeted connections will give rise to new technological and business relations.

Through the **enlargement of the regional ecosystems to the pan-European ecosystem** companies belonging to the regional cluster can have easier access to a larger network and can be easier involved in international activities to detect and generate more business opportunities.

The other significant population of the cluster are the RTOs institutes and academia. Within the combined cluster environment they will have more opportunities to support businesses but they will also have more opportunities for collaboration with peer institutes which will render a significantly higher level of innovative knowledge in a smart specialisation context. Technology transfer to SMEs through industrial contracts will also be facilitated.

Then there are of course the cluster organisations themselves. Being a partner in a world renowned collaboration will automatically lead to a significantly raised profile. Even more important, the larger pool of partners in the collaboration will give much better opportunities to support the members in the own regional cluster. Finally, playing in the premier league, automatically benchmarks the clusters' performance leading to rapid and continuous improvement of all participating clusters.

Of course there are **regional and national benefits** resulting from the cluster collaboration. Increased competitiveness and export performance by key businesses is of great regional and national importance as it will give increased access to potential inward investors and an increased level of external funding utilised by the region and member state. Therefore the impact on growth of SMEs and on employment will also be mentioned.

Equity providers will benefit from the cluster collaboration through access to more possibilities to support business establishment and growth. The cluster organisations will be instrumental in bringing innovative businesses and equity providers together and supporting them in the creation of effective relations.

The cluster collaboration will be in an excellent position to provide input to the regional, national and European policy-makers that will enable them to engineer innovation and economic growth policies that are tailored to the needs of the European micro- and nanoelectronics community at large. In this context, a better understanding of the framework conditions needed by cluster organisations and their members to operate more effectively internationally is of importance as is the way to support growth of local companies possibly through investment in the local ecosystems (in a harmonised way, on a European level). Also the improved international visibility of the local ecosystems is of benefit to the policy makers in their internationalisation efforts.

End users, the parties that will enjoy the fruits of the enforced European micro- and nanoelectronics business, will find better responses to their needs due to closer continental contact between the end user and the product/technology providers that will use the MNE innovations.

Furthermore, clusters, but in particular the Silicon Europe meta-cluster collaboration, has the potential to have an indirect effect on society as a whole due to MNE's permeation in our daily lives.

4.1.7 Assessment of the impact for each strategic theme of the JAP

For assessment of the impact for each strategic theme of the Joint Action Plan a quantitative approach has been set up and several key performance indicators were defined.

Theme 1: Knowledge and technology transfer

Cross-regional availability of knowledge and technology throughout Europe will ensure that capitalisation of the knowledge will be stretched to the maximum as no opportunity will be left aside to use the knowledge and consequent technology. How various parties will benefit from the knowledge and technology transfer effort by Silicon Europe is presented in the introduction of this chapter.

Key Performance Indicators (KPI´s) of knowledge and technology transfer				
Title	**Brief Description**	**Target *(quantity)***		
		2015	***2016***	***2017***
AtoB events	performed international transfer events between Science and Industry, e.g. Cool Transfer Day	1	3	4
Quantity transfer projects	successful initiated international transfer project between Science and Industry -> **yearly cluster survey**	1	3	4
Pilot lines	Number of SMEs aware of the European pilot facilities for experimental, educational and pilot production work	150	300	600

Table 10: KPI´s of knowledge and technology transfer

Theme 2: Smart specialisation

A sound Smart Specialisation implementation will provide:

- Increased cross-cluster cooperation along interregional extended value chains
- Through a continuous exchange of experiences within the Silicon Europe consortium, lessons learned will be distributed between the Silicon Europe regions on a regular basis. This will help to implement the Smart Specialisation strategies both effectively and efficiently.
- Increased alignment of regional and cross-regional projects with the individual regional Smart Specialisation strategies and therefore increased combination of H2020 and ERDF funds.

Particular to Smart Specialisation the following Key Performance Indicators (KPI's) will give insight in the success of the chosen approaches:

Key Performance Indicators (KPI´s) of smart specialisation				
Title	**Brief Description**	**Target *(quantity)***		
		2015	***2017***	***2018***
Regional authority forum	Regular meeting between at least two regional authorities to exchange knowledge and implementation status of smart specialization strategy	1	2	2
Influenced Policies	Number of policies, which are based on active contribution by Silicon Europe, e.g. Interreg Europe	1	1	1
Funding sources	Number of projects using synergies between different funding sources (H2020, regional, ERDF, …)	2	5	10
Field labs	Number of created field labs	0	2	4

Table 11: KPI´s of smart specialisation

Theme 3: SME funding

The Silicon Europe partners, as cluster organisations, play a crucial role in understanding SMEs' needs, being their voice at local, regional, national and European levels and supporting them in having easier access to public & private funds, needed to generate business- and technological partnerships' opportunities.

Key Performance Indicators (KPI´s) of SME funding				
Title	**Brief Description**	**Target *(quantity)***		
		2015	***2017***	***2018***
Foreign investors identified	Number of foreign investors identified and contacted for investment in Europe	2	10	10
Internationalization events	Number of companies from Silicon Europe attending events (missions, matchmaking events) organized for attracting VCs, e.g. 5i forum	2	3	4
Access to financial resources	Number of new Silicon Europe SMEs accessing the available financial resources (including EU funding programmes)	5	15	20

Table 12: KPI´s of SME funding

Theme 4: International business development

Today, the micro- and nanoelectronics industry is a global industry. Many of the MNE companies, whether LE or SME are part of a global value chain. This means that, in particular for high tech clusters, competition takes place not on a regional nor on a national level but on a global level. Therefore, international business development has become increasingly important to improve the competitiveness of enterprises of all sizes.

Key Performance Indicators (KPI´s) of international business development				
Title	**Brief Description**	**Target *(quantity)***		
		2015	***2016***	***2017***
Cluster Collaboration	Number of collaborations with organisations in target regions outside of Europe established -> At least one for each target region	0	3	3
Events in target regions	Number of activities organized in the target region: international B2B events, trade missions etc. (including common both)	1	2	2
Presence of SMEs	Number of foreign SMEs attending local international flagship events organized in cooperation with Silicon Europe	5	15	20
Support of SMEs	Number of SMEs supported in internationalization	2	15	20

Table 13: KPI´s of international business development

Theme 5: Promotion of micro- and nanoelectronics

Efficient communication and information exchange is a key issue to link the involved clusters to public and political actors. The sustainable strengthening of the brand “Silicon Europe” and speaking with one voice in- and outside of Europe help to attract the different stakeholder groups, which benefit from promoting MNE technology will be of great benefit.

Key Performance Indicators (KPI´s) of promotion of MNE				
Title	**Brief Description**	**Target *(quantity)***		
		2015	***2016***	***2017***
Website visits/hits of relevant markets	Number of relevant visitors to the Silicon Europe webpages	15000	20000	30000
Appearance in medias of target markets	Number of relevant publications about Silicon Europe	25	40	60
Silicon Europe branded presentation	Number of Silicon Europe branded presentations at any events, companies etc.	10	15	20
Relevant News on Silicon Europe website	Number of News in context of Silicon Europe published on the website of Silicon Europe	20	25	30
Visibility outside Europe	Number of international events where Silicon Europe is present	1	2	2
Request from target countries	Number of contacts that requested additional information	20	30	40
Registered contacts	Number of bilateral contacts established during promotion activities added to the contact database	30	45	50

Table 14: KPI´s of promotion of MNE

4.2 Main dissemination activities and exploitations of results

Silicon Europe disseminated all results of the project by selecting the appropriate modes of communication to address the relevant stakeholders. The **key messages** of Silicon Europa were agreed by all partners and are summarised in the joint vision mission statement (see chapter 3.2.6). The stakeholder were invited to take part in various events to discuss the results and to provide them with relevant information. Flyers were developed to disseminate the project results. Several dissemination activities like e.g. workshops, joint booths and B2B matchmaking events have been organised (some of them in co-operation with SEMI and EEN). There were also various publications in newspapers and other medias to reach the stakeholders like industry, research and also the civil society. The publications focus on main activities like e.g. the start of the project in October 2012, the dissemination event with regional political representatives in February 2013, or the final Silicon Europe activities during Semicon Europa in October 2015.

The main dissemination activities dedicated to different target groups were:

- **Creation of project website www.sillicon-europe.eu**
  - Main target group: civil society, scientific community, industry, policy makers, medias
  - Extensive information about the project and the participating cluster including upload of Silicon Europe news and publications

- **Creation of Silicon Europe image video**
  - Main target group: civil society, scientific community, industry, policy makers, medias
  - Short video about the Silicon Europe clusters and

- **Dissemination event with regional political representatives, February 20th, 2013 in Brussels**
  - Main target group: policy makers
  - Discussion with regional representatives about the future of MNE

- **Silicon Europe Clusters´ Joint Statement**
  - Main target group: policy makers, industry, scientific community
  - Silicon Europe position paper signed by representatives of the regional governments (Rhône-Alpes, Saxony, Carinthia)

- **Meeting with DG CONNECT, October 1st, 2013 in Brussels**
  - Main target group: policy makers
  - The meeting was about the implementation of the 'European Strategy for micro-and nanoelectronics components and systems' with discussion about how Silicon Europe could contribute to the strategy and what smart specialisation could add.

- **Policy Workshop November 5th, 2014 in Brussels**
  - Main target group: policy makers, industry, research

- Workshop on micro- and nanoelectronics and its role as key enabling technology with the support of SEMI
- Discussion on challenges and opportunities with regards to reindustrialisation of Europe

- **Press Conference, October 8th, 2012 in Dresden**
  - Main target group: medias
  - Announcing of the project start and building first relationship with the medias

- **Press Conference October 6th, 2015 in Dresden**
  - Main target group: medias
  - Publishing of the Joint Action Plan, announcement of new Silicon Europe Alliance with new board and enlarging the partnership by 6 new members after the end of the project

- **Workshop European Clusters and Regions, October 7th, 2015 in Dresden**
  - Main target group: policy makers, industry, research
  - Workshop on the role of the European clusters and regions in electronic components and systems organised by DG CONNECT and Silicon Europe

- **1st Silicon Europe Taiwan Day, September 4th, 2014 in Taipei**
  - Main target group: industry, research
  - Half-day event during SEMICON Taiwan on enhancing transnational and cross-continental innovation presenting European competitive clusters' know-how, experience and innovations related to electronic components and systems in Europe and the strengths of European MNE
  - Organised by EBRC together with Silicon Europe

- **2nd Silicon Europe Taiwan Day, September 3rd, 2015 in Taipei**
  - Main target group: industry, research
  - Half-day event during SEMICON Taiwan bringing together key industrial and institutional MNE players in Europe and Taiwan

It is very important to **exploit the results also beyond the duration of the project**. Therefore, follow up activities were already defined, e. g. participating at the following events:

- DSP Valley B2B Forum, June 2016, Leuven
- Silicon Saxony Day, July 2016, Dresden
- Semicon Taiwan, September 2016, Taipei
- Semicon Europa, October 2016, Grenoble
- Smart Systems Industry Summit, October 2016, Mechelen

Additional, a Steering Committee Meeting is scheduled for the 1st quarter of 2016. The kick off meeting of the ESCiP project will be held on 21st January in Athens.

ANNEX: Input partners

I. INPUT PARTNERS TO EXECUTIVE SUMMARY

A. PARTNER 1, 10 – German consortium

PARTNER 1 – Silicon Saxony:

Silicon Saxony, project coordinator of Silicon Europe, has ensured the overall management of the project within the steering group, coordinated the day-to-day administration and monitored the project progress. Silicon Saxony was also responsible for the regular, customized and harmonised communication and dissemination of results and findings towards different target groups. Silicon Saxony was the leader of WP1, WP2 and WP6 and contributed to all other work packages.

PARTNER 10 – Eurogrant:

Eurogrant was responsible for all aspects of the administrative project management, such as contract management, financial management, documentation and reporting of activities as well as ensuring a proper dissemination of all activities and results.

B. PARTNER 2, 3, 4 French consortium

PARTNER 2 – Minalogic:

Minalogic has been an active partner in the Silicon Europe project, an outcome of the long term cooperation between two major microelectronics' ecosystems (Grenoble & Dresden). In terms of manpower, nearly 90 % of one project manager's time has been dedicated to the project over its three-year duration as well as significant input from the technical director for microelectronics and from Minalogic's CEO Smaller, punctual commitments from different other employees such as the communications manager and the technical director for software have also been necessary over the course of the project.

The involvement of Minalogic, as a renown large cluster in the project has been beneficial, both for the project consortium and for the Rhone-Alps' ecosystem. Minalogic was instrumental at all stages of the project for the consortium: it pro-actively contributed to all WP deliverables, especially on WP 4 on internationalisation that was led by local partner AEPI, but also was the initiator of many pilots during the course of the project: for example when organising an event presenting the R&D offer of the ecosystem to the industry (all regions joined by video-conference) or when sharing information of the H2020 calls for proposals to contribute to project ideation, or again when working closely with AENEAS and public authorities to design an SME-friendly PENTA programme. The Rhône-Alps'ecosystem also benefited from the Silicon Europe project, as some success stories gathered from Minalogic's members showed (Soitec, SET, Dolphin…). The close relationship with other microelectronics'clusters in Europe that is the main outcome of the Silicon Europe project is deemed crucial to transnationalise the value added that clusters bring at regional level and to support the European micro-and nanoelectronics' industry, in support of the European strategy on that topic.

Minalogic is and will remain a strong advocate of the Silicon Europe alliance after the end of the project.

PARTNER 3 – AEPI:

AEPI, the invest in Grenoble-Isere has been an active partner in the Silicon Europe project, right from the very beginnings of the relationship and cooperation between the region of Dresden and its microelectronics ecosystem, though its cluster Silicon Saxony as well as its local government, along with a close connection to the other 2 actors from the Grenoble region: Minalogic and city of Grenoble (then Grenoble Metro). In terms of Manpower, the actual involvement has been quite different depending on the work packages, ranging from about ¼ time of the project manager for the first year to3/4 time during the second year and the completion of work package 4, where AEPI was the WP leader, to around 50% for the 3rd year. The work was done mostly by the project Manager, with the input from an intern during the 2nd year, and punctual commitments from other services such as the statistics department or communication manager.

The involvement of an economic development agency such as AEPI, which is widely recognized for its know-how on international ecosystems, and most especially outside of Europe as well as a long history of initiating international collaboration on cluster or regional level has allowed to leverage a worldwide knowledge of microelectronics stakeholders as well as incorporate marketing and communicating methodology to the presence and renown of the Silicon Europe brand.

AEPI was able to leverage as well its presence in Asia and the US to promote and advocate European microelectronics around the world; on the other hand, the Silicon Europe entry was a much more adequate geography level to raise the attention of key players, and eventually make them aware of the European advantages and skills, as well as investment opportunities.

On the part of collecting data about the local companies and stakeholders, AEPI was able to provide very accurate and detailed data on company profiles located in the region and members of Minalogic with number of jobs/evolution and specific activities.

AEPI is and will remain a strong advocate and supporter of the Silicon Europe Alliance

PARTNER 4, 11 – Grenoble:

Grenoble-Alpes Métropole, and previously the City of Grenoble, have been active members of the Silicon Europe project.

In terms of manpower, approximately 50% of one project manager's time has been dedicated to the project (over its three-year duration) as well as significant input from the supervisor and the director of economic development. Smaller, punctual commitments from different services such as international relations, protocol and finances have also been necessary over the course of the project.

The involvement of a political partner in the project has been beneficial, both for the project consortium and for the City of Grenoble/ Grenoble-Alpes Metropole. For the Silicon Europe

consortium, it has allowed for the clusters to have a direct link to the local political decision makers and to be very involved in shaping local policy in support of the micro-nanoelctronics industry. For the City/ the Metropole, it has allowed the City to maintain its existing links with Dresden and to foster new relationships with the other regions involved in the project. Furthermore, it has allowed for a close working relationship with other local actors, working in support of the micro-nanoelectronics industry, and to shape policy based on the needs of the industry. Additionally, it has allowed the City/ the Metropole to be involved in developing a European strategy in support of the micro-nanoelectronics industry as a whole.

The involvement of a native English speaker has also allowed for translation work and proofreading of official documents and communication documents to be carried out internally, within the project consortium, rather than outsourcing this work.

C. PARTNER 5-6-7 – Dutch consortium

For the Netherlands the regional development agencies, the BOM and Oost NV and the cluster organisation High Tech NL (at the time of project initiation called Point One) entered into the Silicon Europe project jointly as their objectives coincided and that in this combination the “triple helix” for the South-East Netherlands was best represented. As such this combination was able, within the Silicon Europe project, to further align semicon related companies, universities, research institutes and policy makers along the lines of collaborative European innovation as well as internationalisation beyond Europe. Later on in the project Business Cluster Semiconductors joined the Dutch alliance as associated partner to the project ensuring a further and more complete coverage of the Semicon eco-system in the SE-Netherlands. Secondly, as envisaged, the Silicon Europe project has really established and strengthened the position of the Dutch industry and associated cluster organisations in the European micro- and nanoelectronics ecosystem

II. INPUT PARTNERS TO PROJECT CONTEXT UND OBJECTIVES

A. PARTNER 1, 10 – German consortium

<u>PARTNER 1 – Silicon Saxony:</u>

- Support the expansion and development of the existing network
- Creation of added value for the members of Silicon Saxony
- Enlargement of cooperation between industry and research institution on a European and international level
- Internationalisation
- Increasing awareness of Silicon Saxony in Europe and worldwide

B. PARTNER 2, 3, 4 French consortium

PARTNER 2 – Minalogic:

Micro- and nanoelectronics is the largest industry in Grenoble and very important at Rhône-Alps' level. As a KET, it is inscribed in nearly all domains of smart specialization that Région Rhône-Alpes adopted. The region was recognised in 2013 by the European Commission as one of the 3 main regions for microelectronics in Europe.

Minalogic when joining Silicon Europe four main objectives that have been achieved:

- Build a strong partnership with key microelectronics' clusters in Europe to create new opportunities for development for our members at European level (R&D and business). On the R&D side, many projects in H2020, ECSEL, CATRENE include partners from our regions showing the strength of these interconnections. On the business side, as a example, the participation of DSP companies at our B2B, or of Minalogic's companies at DSP B2B had concrete outcomes.
- Contribute to the implementation and in the medium term definition of the European strategy in support of the industry
- Contribute to demonstrating the value added that clusters play at regional level and transnationalise it. The role that Silicon Europe is playing in defining an SME-friendly PENTA programme has proven this.
- Make Minalogic known in Europe as a cluster for excellence, and internationally as a member of a strong alliance. The Taiwan experience in early September 2015 shows the strength of this approach.

PARTNER 3 – AEPI:

Micro and nanoelectronics is the largest industry in the Grenoble-Isere region, and concentrates indeed 1/3 of the jobs in electronic components fabrication in France, as has shown a recent statistical report carried on by AEPI statistics department. It has brought on more than 6000 additional jobs within the period 1999-2009 as well, and to these have to be added the subsequent jobs induced in subcontracting and suppliers as well as resulting increase in services to the population; As such it is a key domain for economic development in the area and given a lot of attention as how to maintain the level of activity and excellence in industry as well as in R&D. As it is an enabling technology, it has as well an impact in many other domains of industry such as medical technology or energy, which are key in addressing societal issues. The region is indeed recognized by the European Commission as one of the 3 main regions for microelectronics in Europe, and the local and national authorities have kept supporting this sector massively through R&D infrastructure as well as disruptive technology programs, as well as through favourable economic environment.

AEPI when joining the Silicon Europe project had several objectives:

- Enhance the image of Grenoble and Minalogic cluster as a region of excellence in microelectronics, and a full member of a strong European alliance, as well as promote globally European microelectronics and communicate about its strengths and know how.

- Leverage some “defacto” existing collaboration with other European regions (and notably with Dresden and Silicon Saxony), and help potential European companies develop their business in Grenoble, as well as work with Grenoble partners to help local companies to collaborate with European partners
- Implement European strategy for the development of microelectronics, and leverage KET as a vector to develop other economic sectors such as Medical Technologies or Energy, as far as societal issues are concerned, as well as foster job creation.
- Bring in actors and investors into Europe, which might leverage the development of our startups or SMEs, or fill in missing segments of the value chain.
- Benchmark global competition, understand other ecosystems and check their support systems, understand where European added value lies, where lie complementary skills and where Europe might fill in some gap in the value chains (ie Taiwan IC foundries are very strong but import most of their equipment)

PARTNER 4 – Grenoble:

Micro- and nanoelectronics is the largest industry in Grenoble and by far the biggest employer both in private companies (large companies and SMEs) and in publicly funded research. These actors have put Grenoble on the map as one of the most innovative cities in the world (Grenoble was voted the world’s 5th most inventive city in 2013 by Forbes magazine and was runner up in the European Union’s icapital competition in 2014) and this, in turn, attracts talent to the city’s universities which in turn rank highly compared on international lists.

In order to maintain its reputation and to develop its economy, Grenoble’s local government has long nurtured the relationship between all actors of the triple helix – industry, research and education. It is this strategy which brought the City of Grenoble/ Grenoble-Alpes Metropole on board in the Silicon Europe project.

Silicon Europe has allowed Grenoble’s local government to achieve several objectives:

- To support the local micro- and nanoelctronics industry, to discover, first-hand, the needs of the companies and to do what is possible at a local level to support them
- To carry the messages from these companies to a European level
- To support the industry’s economic development, the creation and growth of companies and ultimately the creation of jobs
- To work closely with actors from other European regions to encourage partnerships and business between the different industrial actors on their territories
- To assist in the development of European-wide strategies in support of the industry
- To maintain its reputation as a territory that supports its innovation economy
- To nurture and to develop its international relations

C. PARTNER 5-6-7 – Dutch consortium

The main objectives for High Tech NL, the BOM, Oost NV and Business Cluster Semiconductors are:

- Create mechanisms for the Dutch industry, in particular the SMEs to enter into European wide innovation activities
- Give Semicon SME's a better and more coordinated voice in Europe
- Support and stimulate the Semicon SME's in their Internationalisation efforts, both in Europe (amongst the Silicon Europe partners) as outside Europe (to for example China, Taiwan and the US).
- Profiling of the Semicon industry in the Netherlands, so policy makers are more aware of the importance of this industry and the impact and opportunities this industry offers
- Creating mechanisms and opportunities for the exchange of knowledge across Europe to support innovation.

PARTNER 8 – DSP Valley:

The main objective for DSP Valley was to join forces with the leading European semiconductor industry in order to increase the impact of the DSP Valley cluster members on European and on international level. In concrete, to come to a Joint Action Plan with defined activities on how to foster collaboration among the Silicon Europe partners and to establish activities with other European and international semiconductor actors. To this extend the goal was first to characterize the Flemish semiconductor offering and requirements on industrial, academic and political scale in a detailed SWOT analysis and to compare it with the requirements and offering from the other regions. Important also is to come to a common understanding of the joint capabilities in order to pursue the right opportunities on a pan-European and a word-wide international scale.

The Joint Action Plan must contain at least detailed proposals for the joint activities, the financial aspects including funding opportunities and supporting actions such as common trainings, recruitments, staff exchange and dissemination.

It is also the goal to establish the first common actions and first collaboration with the other Silicon Europe partners already during the duration of the project. These include participation to the major flagship events such as exhibitions, B2B and A2B.

III. INPUT PARTNERS TO MAIN S & T RESULTS/FOREGROUNDS

A. PARTNER 1, 10 – German consortium

PARTNER 1 – Silicon Saxony

A detailed in depth analysis of the Silicon Saxony cluster has been made within WP2 regarding regional RTD framework conditions and RTD actors. Around 80 % of the analysed cluster members are SMEs.

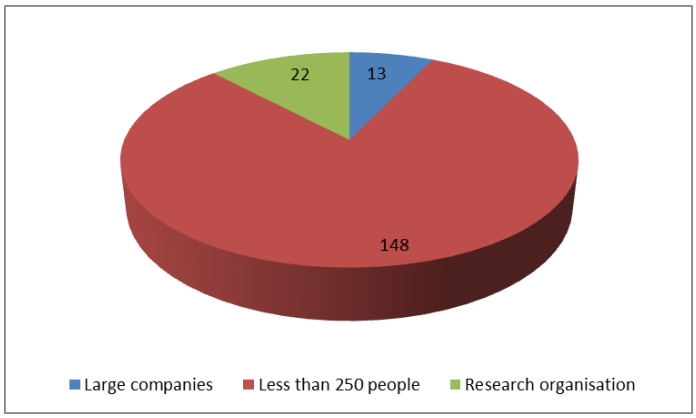


Figure 21: Cluster structure of Silicon Saxony

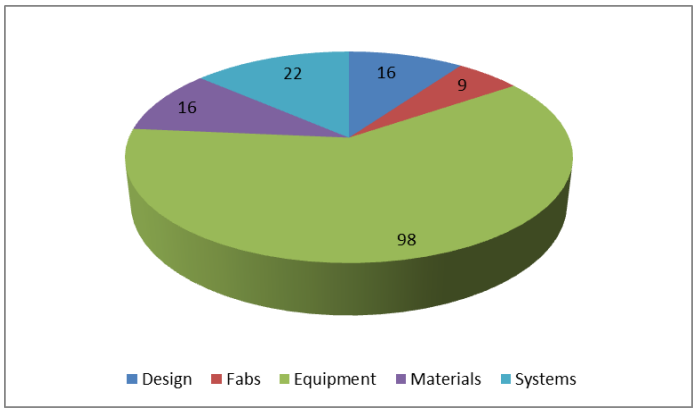


Figure 22: Value chain of Silicon Saxony

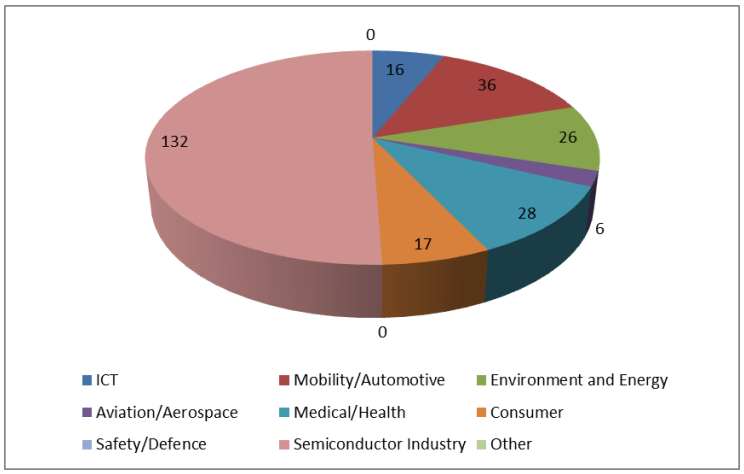


Figure 23: Market focus of Silicon Saxony

Around 60 % of the enterprises are having their core business in the sector equipment and half of the companies are engaged within the field of semiconductor industry.

A regional SWOT analysis from an economic, innovation and RTD perspective has been elaborated.

Strengths	Weaknesses
• Competence for high-volume chip production by Infineon and Globalfoundries, • most powerful micro-chip production in Europe (every 2nd chip made in Europe is from Saxony) • Silicon Saxony as core of the ICT cluster (2,100 enterprises, 51,000 employees) • Strong research landscape (9 universities with over 100,000 students - approx. 45,000 relevant for MNE, 13 relevant Fraunhofer institutes, HZDR, 3 relevant institutes of the Leibniz Association, 3 relevant institutes of the Max Planck Society • Working technology transfer structure (Namlab, GWT, 20 Technology Centres and Incubators, 5 cross-university start up initiatives) • Dedicated education schemes on worker level (dual study, professional schools) • Strong strategic cooperation between Cluster and the regional authorities • Real triple helix managed high-tech region • Microelectronic as enabler identified in the regional smart specialisation strategy • 2.88% (1.6% public) of the Saxon domestic product is used for R&D -> 5th in German ranking • Silicon Saxony is recognized as strongest microelectronic cluster in Europe • Competence for energy efficiency in Cool Silicon Cluster – ranked as the strongest national leading edge cluster (BMBF) <u>Technology:</u> • Vast experience in high volume production (More Moore and More than Moore, 200mm and 300mm) • Strong industrial base for equipment makers, materials • 3D-integration, smart systems-integration • Application competence for automotive, engineering, energy, medical	• Small-scale structures of Saxon economy (many SMEs, no headquarters of large companies in Saxony) • Systems and final-products approach (weakness at the end of the value chain) • Lack of Venture Capital and Business Angels • Lack of structured innovation management within the companies • Decline in start-ups (start-up intensity with 61 per 10,000 working people is below the German average 78) • Insufficient use of knowledge transfer structures • Low proportion (approximately 15%) of women in MINT-subjects (mathematics, IT, natural sciences, engineering)

Table 15: SWOT analysis Silicon Saxony (strengths and weaknesses)

Opportunities	Threats
• Cross cluster cooperation for enhancement of innovation • Coordination of the research activities of the European Clusters regarding the market trends • better cooperation between the key players in industry and RTOs in Europe´s Microelectronics Clusters => indispensable for future growth • Alignment of European, national and regional strategies (European Strategy on microelectronics, Innovation Strategy) and respective measures • Strategy alignment with application industries • Focus on consumer products/industries (high potential of multiplication), create new player for consumer products • More foundations of technological start-ups than German average and above-average potential for technology-oriented start-ups from universities and research institutes • Growth of software segment – 500 employees in Dresden, research institutes for embedded software and systems (cyber-physical systems), more systems provider companies (e.g. server, embedded products etc.) <u>Technology:</u> • Continue with More Moore and More than Moore with the goal of convergence as well venturing Beyond-CMOS • Interdisciplinary cooperation with biotechnology, organic electronics, optoelectronics, mechanical engineering, agriculture, health care • Microelectronic as enabler/driver for future Mega Trends (Industry 4.0, smart mobility) • Many changes in cyber-physical systems engineering (Smart City, Smart Logistics, Smart Factory, Smart Car, Smart Grid, Smart Systems, Smart Lighting, Cyber Security)	• Existing European regulation of competition and investment • Supply and technology dependency on Asian 450mm Foundries • Decrease of EU funding (structural funds) • Lack of national co-financing within ECSEL • Increasing energy costs through current national energy policy (“Energiewende”) • Demographical change => decreasing start-up activities and potential lack of skilled staff • Challenge of successor establishment for SMEs

Table 16: SWOT analysis Silicon Saxony (opportunities and threats)

Silicon Saxony has particular high competences compared to the other regions in the fields fabs, equipment and materials as shown in the next figure.

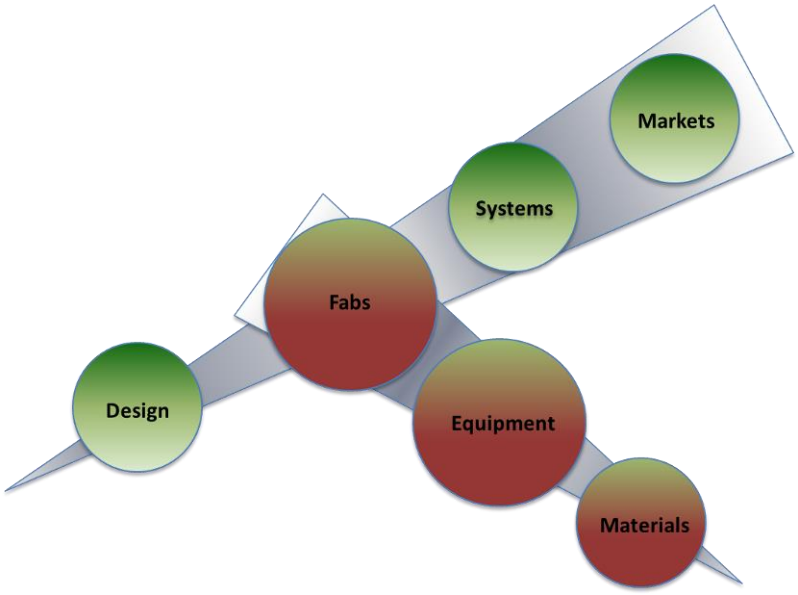


Figure 24: Value chain Silicon Saxony

A. PARTNER 2, 3, 4 French consortium

PARTNER 2 – Minalogic:

The best way to explain the tangible outcome of the Silicon Europe project is to start with what was planned in the Work Package.

General Objectives of WP2 as stated in the DoW were the following:
In-depth analysis of
1. Existing regional RTD and economic development policies, plans and activities
2. Regional public and private RTD actors as well as financial actors related to RTD
3. Existing regional smart specialization strategies
4. Existing regional cluster policies for the four involved clusters
and identification of complementarities, synergies and (further) smart specialization potential at the i) local level ii) national level iii) European level

WP2 reached the above objectives in terms of sharing information on the 5 respective regional ecosystems and clusters, incidentally benchmarking and identifying best practices, as well as identifying complementarities. A detailed list of Commonalities and & Complementarities resulted from the comparison & analysis of the respective SWOT provided for by each cluster. Finally this consolidation was the starting point for the WP 3: Development of a Joint Action Plan, where a selection and a detailed elaboration of actions were elaborated. WP2 was also the first opportunity to connect our ecosystems and Minalogic used this opportunity to organize an event gathering 100 participants and presenting the R&D offer within our ecosystem, in videoconference with the other Silicon Europe clusters. Minalogic also shared its analysis of interesting H2020 published in the autumn 2013 with its members and Silicon Europe clusters to stimulate joint R&D projects. It is difficult to measure impact of course, as members may not always inform us of the applications they

submit and those which are successful. Nevertheless, the thorough analysis of available information on funded projects (FP7, H2020, CATRENE) since the beginning of the project has demonstrated the importance of interconnections between our cluster members:

'Optimistic'

	ENIAC JU	ECSEL	CATRENE*	Eurostars	Celtic -Plus	FP7 - ICT*	H2020 LEIT ICT*	Total
2012	9	/	3	1	0	4	/	17
2013	12	/	6	0	0	55	/	73
2014	/	8	5	0	0	/	28	41
Total	21	8	14	1	0	59	28	**131**

** **These figures have to be checked** . Indeed, sometimes we do not have enough details on companies to determine whether they are members of a Silicon Europe cluster or not.*

In conclusion this Work package was instrumental in building trust between the partners. A lot of information was gathered and openly shared.

The general objectives of WP3 as stated in the DOW were:

- To create – in view of Horizon 2020 – a sustainable collaboration programme for the top semi-conductor clusters and regional actors in the field of semicon RTD & Innovation to stimulate RTD investments and innovation in energy efficient applications
- Definition of a set of interregional actions to stimulate investments in RTD and innovation aimed at optimizing energy efficiency of new applications of semicon technology
- Building a network for setting up the Silicon Europe action programme.
- Defining the Silicon Europe action programme (JAP).

The Silicon Europe partners no doubt reached the aforementioned objectives. WP 3 was bout jointly determining the concrete actions that Silicon Europe clusters wanted to understake together. The outcome of this Work Package - and the 5 main categories of actions that were deemed crucial - forms the basis of our strong willingness to continue our cooperation after the end of the project. It is why we have decided to develop into the Silicon Europe Alliance, and to open up to new members. It is now clear that we have a sustainable collaboration programme for the top semiconductor clusters and regional actors in the field of semicon RTD and innovation. This Joint Action Plan will be continuously updated as we go on. In Minalogic's point of view, the objectives of bringing our SME members closer to private and public funding , and to help them internationalise are the most important dimensions of our JAP.

WP4 was about the definition of a strategy for internationalization. The DOW indicated that we had to define an internationalization strategy for Europe's top micro/nanoelectronics clusters, within Europe and worldwide, for boosting the competitiveness of the clusters via dedicated measures.

Thanks to the strong commitment of the Grenoble team partners (led by AEPI), that objective was reached. A benchmark of potential interesting competing regions to match with was elaborated and

this formed the basis for determining priorities. The Silicon Europe partners even used the opportunity of the call COS-CLUSTER-2014-3-03 – Cluster Go International to submit a proposal with 2 other clusters in Greece and Italy that was accepted. This proposal was accepted and the work will begin with Taiwan and the US.

Other actions that were tested during the course of this WP include joint booths at international fairs, organising workshops abroad to promote Silicon Europe & the European microelectronics' industry.

WP5 was about starting the implementation of the JAP.

The overall objectives of this WP according to the DoW were to explore opportunities for mobilising financial and other forms of support offered by national/regional authorities, by private investments and by EU programmes (Research Framework Programmes - Horizon 2020, Competitiveness and Innovation Programme - CIP, Structural Funds), in order to exploit the synergies between regional, national and EU programmes for research and economic development. It was also to start coordination work and accompanying actions for the Joint Action Plan implementation.

It is first important to note that one of the main outcomes of the Silicon Europe project is precisely the fact that implementation of the JAP started even during the course of the project. A lot of actions were tested, events organised, concrete collaboration initiated.

Mobilising financial support was not an easy task. After identifying potential sources of such a support, the Silicon Europe partners concentrated their efforts on 3 main ideas:

1. COSME

As mentioned above, Silicon Europe has already secured funding for one dimension of its JAP: its internationalisation strategy.

2. INTERREG Europe (call published in Spring 2015 with deadline in July)

A project proposal was worked out aiming at the implementation of part of the JAP. A consortium was proposed existing of the Silicon Europe members and the Grenoble Metro as the lead partner. This proposal has been discussed with the Interreg Europe secretariat on May 12th in Paris. Main feedback was:

- Wrong consortium: consortium should mainly consist of public authorities. A new proposal could involve a local regional authority and a cluster.
- Only having economically strong regions involved could be considered as a weak point. ERDF are meant to help weaker regions to improve. It could be a plus to involve new partners from less experienced countries, even if it was also recognised that the current regions involved in Silicon Europe are the most advanced in terms of microelectronics and that the EC itself considered it best to capitalise on these strengths.
- Interreg Europe is not meant for implementation activities, only for the improvement of policy and exchange of best practices.

- Also the different regions are not yet clear about their possible support for such a project proposal. Therefore the clusters agreed that no application would be handed in in the 2015 call but are planning a meeting with the regions at SEMICON Europa Dresden to anticipate the 2016 call. All clusters considered it interesting for their members to support the exchange of best practices between the Silicon Europe regions with regards to support to SMEs for example, specifically in the microelectronics' sector.

The conclusion was that Interreg Europe is not the right programme to support cross-regional cluster collaboration in Europe but that it could be an interesting option for the regions to continue working together to better support the clusters and their members by submitting a proposal in 2016.

3. PENTA

Silicon Europe was instrumental in the past months in supporting PENTA, a recently endorsed Eureka Cluster that will replace CATRENE as a funding programme, capitalising on its strengths and offering remedies to its identified weaknesses (not least an insufficient SME involvement).

EUREKA's High Level Group met in Switzerland at the beginning of July 2015 and granted a label to PENTA, a new instrument to develop micro- and nanoelectronic technologies, systems and applications, which are of key importance for European competitiveness. This industry is now central to societal and industrial development. Europe must ensure it retains and develops leadership positions in key market segments; such as health, automotive, industrial automation, security and energy.

PENTA is a EUREKA Cluster in micro- and nanoelectronics that supports the vision, strategy and implementation of programmes as envisaged by the Electronic Leaders Group. In particular, it will address the whole electronics value chain and will encourage the participation of innovative European SMEs in the programme. In fact, PENTA fits into the tradition of collaborative research in the field as implemented by programmes like JESSI, MEDEA and CATRENE but extends its scope to include sub-system and end user companies. In this context, the objective of the new Cluster will be to support priorities jointly identified by Industry and Public Authorities, through an understanding of rapidly changing market needs.

Complementary to, but differentiated from the ECSEL Joint Undertaking, PENTA will be a flexible and agile programme. It will identify opportunities, quickly assesses national governmental support and operate with a short, but effective, approval process. With its focus on smaller, faster and flexible projects, the new Cluster will provide an opportunity to take advantage of rapidly developing markets and their related value chains.

Openness and inclusivity will be at the core of the Cluster. 'Openness' will be visibly demonstrated at all levels, offering equal opportunities to all interested participants. 'Inclusivity' will be ensured through a range of activities centred on the creation of a "Market Place". It will bring visibility of the innovation that exists across Europe to the key electronics value chains and catalyse the formation of partnerships to take advantage of, and commercialise, these capabilities. Managed information exchange and networking will allow the efficient formation of focussed, well resourced, consortia

developing leading edge technologies and applications. A special emphasis will be placed on SME involvement, to ensure Europe takes advantage of their innovative attitude and opportunity for rapid growth.

The first PENTA call for project proposals is expected to open in first quarter 2016. Initially, the Cluster is scheduled to run for 5 years.

Silicon Europe, and most of all Minalogic, is actively involved in discussions with AENEAS and public authorities as well as industrials to ensure a real SME involvement in the new programme through a Europe wide dissemination of the calls and to the creation of the aforementioned “market place’.

WP6 visibility

Silicon Europe was the first European project in which Minalogic actively contributed. It allowed Minalogic to gain knowledge and expertise on European project management and better promote opportunities for collaboration for its members that being a member of a European alliance generates.

Silicon Europe contributed to the support of the European industry. Internationally, the project allowed for a benchmark.

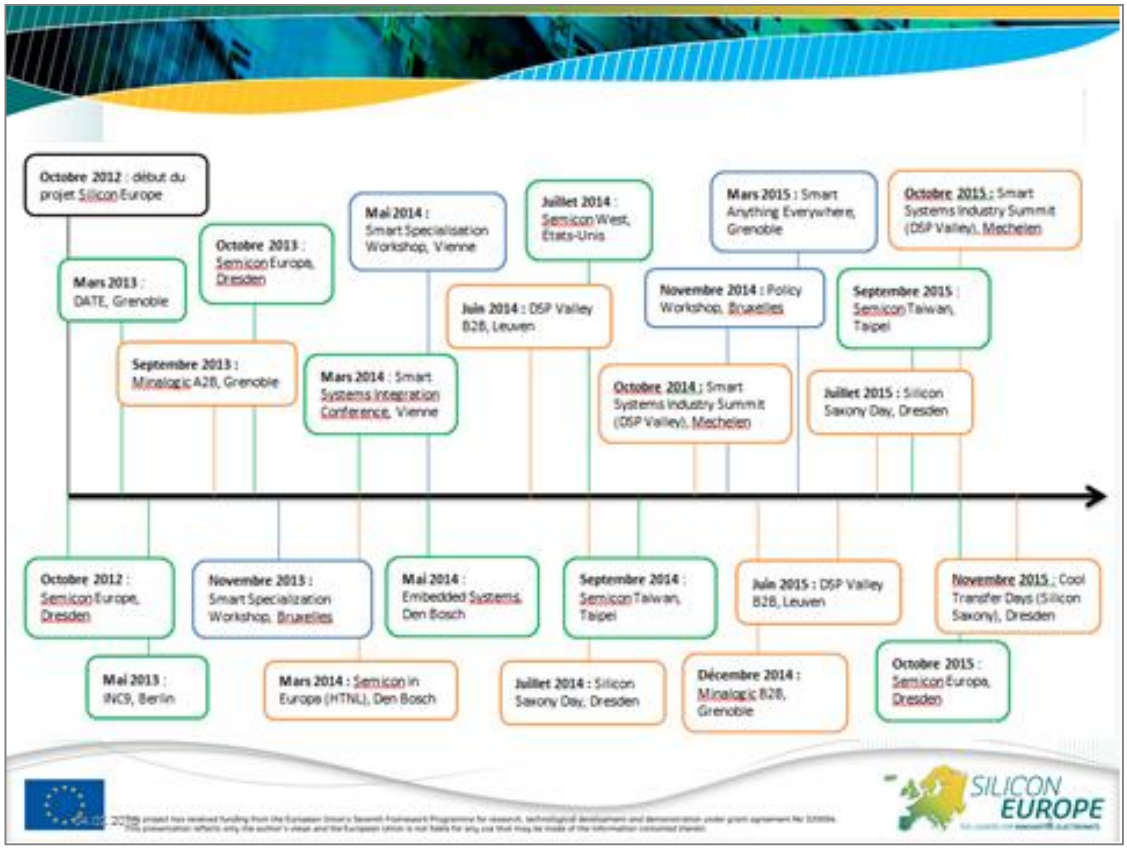


Figure 25: Internationalisation strategy

PARTNER 3 – AEPI:

Although AEPI's involvement was originally planned to be highly concentrated on the internationalization aspect, as well as marketing actions, it was also very active into all work packages.

As far as WP2 was concerned, the extensive and very documented data base of local companies enabled Minalogic to have a very thorough mapping of its members, with a historical perspective on their evolution as well , and update and cross-check each partner's information.

Sharing then the information on the 5 respective regional ecosystems and clusters, enabled a very detailed benchmarking of best practices as well as understanding each cluster's similarities as well as differences, providing insightful analysis for a SWOT.

Working together with Minalogic and the city of Grenoble enabled to reinforce the collaboration and better understand the needs of, respectively companies as well as local government, in terms of creating a favourable environment for the growth of companies as well as expectations from policy makers. AEPI, being right at the crossroads between these 2 actors gained some precious insight as how to get both parties to communicate better.

For more detailed results on WP3, see input from Minalogic

WP4 was lead specifically by AEPI, with the valuable support from its local partners as well as DSP Valley for the European part.

The WP was about the definition of a strategy for internationalization; the DOW indicated we had to define an internationalization strategy for Europe's top micro/nanoelectronics clusters, within Europe and worldwide, for boosting the competitiveness for the clusters via dedicated measures.

The first thing about undertaking such an ambitious task was to benchmark other interesting competing (or not) regions and clusters, and check if similar initiatives were indeed existing elsewhere.

One of the findings was indeed that, although there as in Europe quite an important number of clusters whose topics of interest where either similar or complementary to the 5 silicon Europe partners, and could indeed form the basis for reaching out to other European partners (see WP5 and implementation of Action Plan), the rest of the world had oftentimes quite a different definition of what is a cluster.

The benchmark allowed for the identification of top candidates for collaboration in Europe and outside of Europe and a list was circulated among the partners in order to define priorities in Europe, and outside of Europe. This collaboration is closely coordinated with the European Cluster Semiconductor Forum initiative.

One of the side results was also that it would be very interesting not only to collaborate with other electronics clusters, but also with application clusters in Europe, such as medical technology ones for

example. As a result of this conclusion, 3 of the participating clusters participated into European projects related to medical applications.

The other result was that top priority clusters outside of Europe for the Silicon Europe clusters and their members, result of a bottom up approach, were Taiwan and the US, and as such some concrete events and actions were undertake in both countries.
The international benchmark and assessment was not a sole deskwork job, but a hands-on experience as well. AEPI for this leveraged on its know how related to presence on international fairs or conferences as well as its own representatives in the US and Asia to promote the brand name Silicon Europe, contribute very strongly to the realization of marketing flyers or posters adapted to communication for Asian partners or the US, and co-organize workshops or visits to stakeholders.
2 workshops took place in Taiwan, with strong support from the European commission, and with AEPI and Grenoble partners heavily involved into the organization.

WP5 – For work package 5 see beginning of MINALOGIC contribution

WP5 was about starting the implementation of the JAP.

It is important to note that that some implementation started ahead of time, and enabled partners to actually test out events organization, promotion, matchmaking between cluster members as well as with companies or organizations outside of Europe.

One of the key issues which was raised in starting such implementation is of course the mobilisation of financial support. After identifying potential sources of financial support, one of the sources identified was the COSME Call COS-CLUSTER 2014-03-03 Cluster go international for the support of outreach actions outside of Europe. AEPI was able to join the the consortium, which proved successful, but only as an associated partner though, which hinders somewhat the support it could bring in to such practical actions;

The other H2020 calls identified were not suitable for an economic development agency to take part into, even though AEPI could be a close local partner to the possible Grenoble partners answering them.

As a conclusion as far as AEPI is concerned in this part, Silicon Europe was indeed the first European project in which AEPI has been a full partner, even though it had often in the past contributed to the information and actions necessary to other partners, this was done without any visibility. This project has made it possible to leverage the existing and past know how and presence of AEPI globally, and enlarge the scope of its action.

It has also contributed to gain knowledge and expertise on European project management and opened new possibilities for international actions and support for other local partners, as well as bring in the point of view of economic development policy making into the equation.

On the other hand, the information and knowledge gained about other regions brought precious insights on potential global competition issues, best practices, broad overview of the electronics

industry landscape, which were extremely useful for regional policy makers when they were asked to support major economic policy programs instigated at European and national level (such as Nano 2017 for example).

A. PARTNER 5-6-7 – Dutch consortium

The Dutch contribution to the Silicon EUROPE PROJECT has led a number of tangible results of which the most important ones are described below.

The Dutch partners have devised a practical MindMap of semicon-applications in which efficient energy use is important for the clients and users, e.g.:

- Lighting
- Photovoltaics
- Power storage (graphene)
- Consumer equipment batteries

The partners have explored possible business cases of applications based on more efficient power usage.

As a result of the Silicon Europe project, more semicon SME companies in the Netherlands have had the opportunities gain visibility abroad (e.g. Semicon trade shows) and to do business abroad, leading to extra business.

The project has resulted in a coordinated Joint Action Plan, for the joint Semicon clusters in Europe. This leads to more structured activities and improved results and will capitalise on the "pre-development" that was done during the Silicon Europe project.

The establishment of relationships between the different participating European Semicon Clusters has resulted in a vast and sustainable network that offers direct advantages for the semicon companies, For example an easier way of creation pan-European innovation project consortia.

As a result of the project, a new Silicon Europe Alliance is created, that will capitalise on the Silicon Europe project results and continue and intensify to offer advantages to all participating clusters and their members.

The results of the project have been used to show to the Semicon industry and in particular to SME's the advantages of the availability of a pan-European cluster. This has also been done to policy makers.

B. PARTNER 8, 9 – Belgium consortium

In the context of WP2, a detailed analysis of the DSP valley eco-system has been made. For each of the members of DSP Valley, the company size, type of activities, position on the value chain etc., have all been established and analysed.

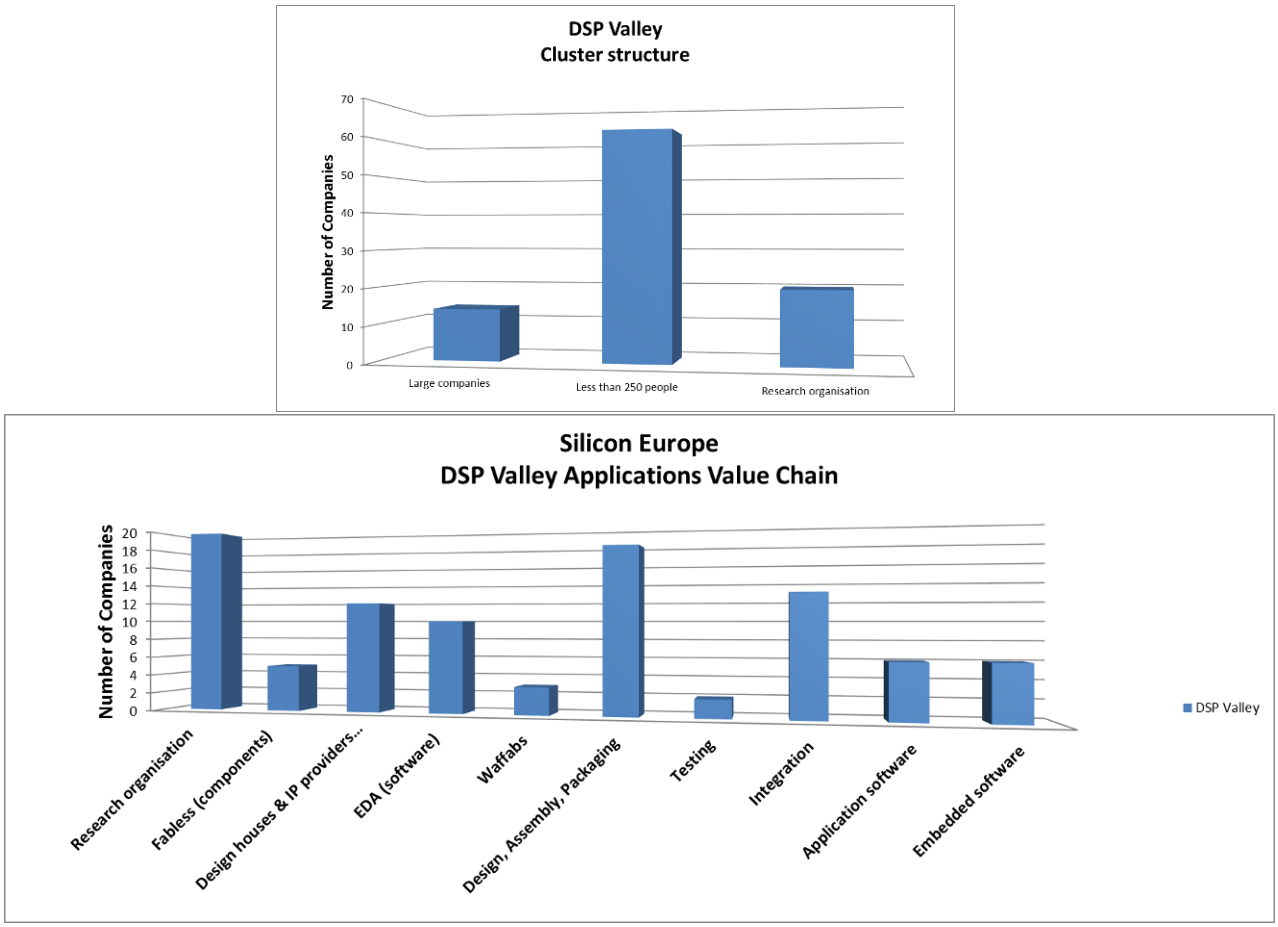


Figure 26: Cartography of the DSP Valley cluster

Together with similar data collected by the other clusters, Silicon Saxony has created the joint overview giving an insight into the current situation within the leading European clusters in micro- and nanoelectronics (Silicon Saxony, Minalogic, DSP Valley, High Tech NL, ME2C). See deliverable D 2.1.

The conclusion is that the DSP Valley cluster has more than 80% SME's and has a strong focus on research, design and systems. The DSP Valley cluster is characterised by an important offering of technological research and development. Almost half of the available resources are spent in research in institutes and universities. The micro- and nanoelectronics lab imec is an important player on world scale. We see also a large gap in bringing these technologies to the market. Important potential is available in microelectronics and embedded system design and development, but this is not fully exploited by the application-end of the value chain. An important number of system integrators are active in niche markets and are ranking well on world-scale. But whenever their products converge to a commodity item with important volumes and revenues, that support further growth, the competition with the far-east is becoming fierce resulting in a complete loss of the markets. Innovation is therefore key, and smart specialisation is the best strategy. Collaboration with other clusters has led to cross- fertilization and created important opportunities in the field of health, communications, vision, building, mobility and energy.

The results of the SWOT analysis done for the DSP valley eco-system are shown in the next figure.

Strengths	Weaknesses
• World leader in broad interdisciplinary research for micro- and nanoelectronics. Accounts for 48% of employment. • RTD platform for 300mm available and 450mm ready. • Wide value chain from basic R&D to system integration, covering a large range of activities in micro- and nanoelectronics. • Innovation ecosystem build around imec and KULeuven. • World-level education and training offer. • High potential in design with highly skilled professionals. • Most niche markets covered, but only niche markets. • Low-threshold access services to advanced technologies. • Smallest region but with important • cross-border activities	• Wide valley-of-death between research and industrial activities. • Weak link between internationally oriented research and regional industrial needs. • Lack of important foundry activity. • Small production basis. • Large number of smaller companies and only few important players. Average number of employees is around 100. • Technological potential not fully exploited.
Opportunities	**Threats**
• Wide support for start-ups and spin-offs from universities, government and VCs. • Strong Increase in employment in R&D in order to cover the needs for innovative development. • R&D activities will further grow due to the internationalization of research and development. • Growing interests in highly integrated smart systems in Energy, Health and Mobility. • Increased opportunities thanks to the diversification in More than Moore rather than More Moore. • Strong involvement of KET pilot lines provides accessible future technology nodes. • Governmental support fostering KETs and clusters • Cross-cutting KETs will support niche players.	• Size matters. Big players ready to take market when volumes and revenues become important. • No activity on equipment builders and related. • Cost of headcount means high cost of research. • Lack of industry scale VCs. • Regulatory framework is becoming world-wide with less leverage from Europe and even less from Flanders. • For smart systems the development effort shifts away from HW to SW. In DSP Valley there are more jobs in SW development than in HW development • Students are more interested in a curriculum in SW development than in HW development

Table 17: SWOT analysis DSP Valley cluster

To link the technological view with the semiconductor value chain the results from D2.1 overview on RTD offers and demands were combined with the SWOT analysis data. The result - a qualitative assessment for the whole ecosystem of Flanders region - is shown in figure 2. The size and colour of the bubbles indicates in which areas DSP Valley has particular high competences compared to the other regions. These are the fields: systems and design (bigger bubbles with red colour).

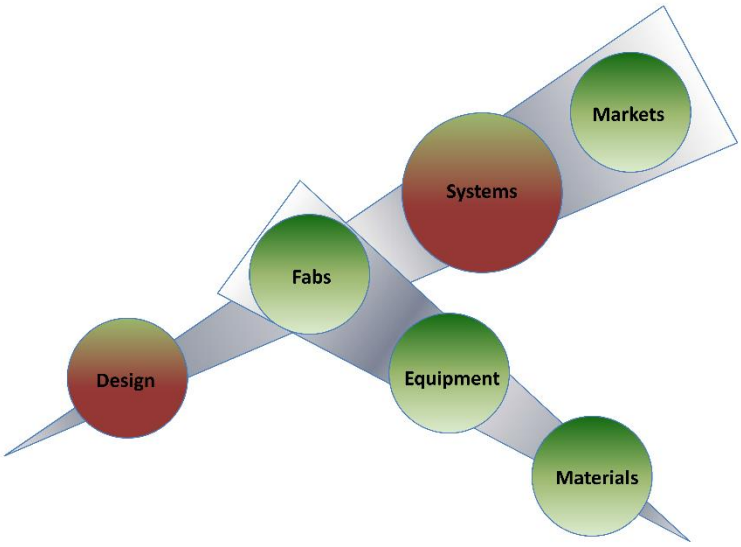


Figure 27: Value chain DSP Valley

The technological view has a strong interaction with the identified future markets: smart wireless, smart vision, smart health, smart home, smart vehicle and smart semicon as described inside the regional smart specialisation strategies (chapter 4.3). Several of those markets will be served already by the DSP Valley cluster.

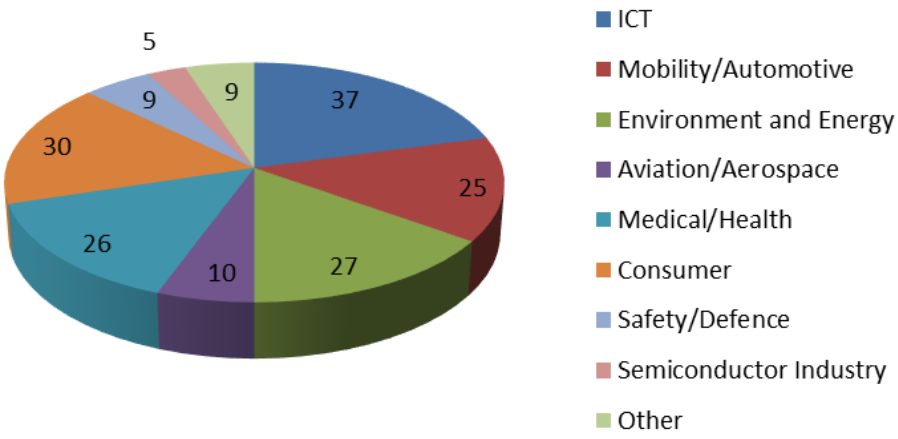


Figure 28: Market focus DSP Valley

Starting from the regional SWOT analyses, a thorough cross-cluster SWOT and commonalities-complementarities analysis was performed by DSP Valley. For the consolidation, 100 common SWOT aspects or indicators have been identified. These are divided in 11 categories and grouped in 5 major sections as follows:

- Scientific: Knowledge transfer
- Human Capital
- Technological
- Economical
  (Smart Specialisation Strategies, Value Chain, Market)

- Policies
  (Cluster Policies and Initiatives, Economic Development Policies, Evaluation of the European and International context, Business Creation, Geographical)

A SWOT indicator is considered a commonality when each participating cluster has given an identical qualification (Strength/Weakness/Opportunity/Tread) to a specific SWOT indicator. Otherwise the indicator is considered as a complementarity. The complementarities are the subject of further actions between the clusters, while the commonalities will be the subject of common actions on an international scale. At the same time, the 100 SWOT indicators have been ranked according to a common priority by general consensus and has a possible action attached to it. This finally resulted in a short list of 14 potential actions for the JAP. The whole process involved large scale workshops with the cluster members, with the policy makers and consultations with leading semiconductor industry experts.

The 14 actions defined are:

1. Initiate involvement in KET pilot lines.
2. Facilitate matchmaking for smart specialisation.
3. Regional and European support for economic development activities.
4. Availability of technologies for electronics for efficient and future power applications.
5. Increase the international visibility of the cluster.
6. Regional and European support for the internationalisation strategies
7. Initiate participation of SMEs in Horizon 2020.
8. Initiate participation of SMEs in JTIs (ECSEL)
9. Initiate strategic cooperation with foreign clusters.
10. Focus on markets related to energy efficiency.
11. Facilitate knowledge transfer.
12. Detect market opportunities outside the regional markets.
13. Open foreign markets for SMEs.
14. Support to the development of Essential Technologies

The 14 action items are grouped in 5 themes according to the overall objectives. This resulted in the following themes for the Silicon Europe Joint Action Plan

1. Technology & knowledge transfer

a. Make sure the required key technologies within the MNE field are available and when relevant, also producible in Europe.

b. Make the state of the art knowledge and know-how, both on technological and economic/business levels, available to the companies of the different clusters.

2. Implement the smart specialisation strategy.
3. Bridge the gap between SMEs and Funding Instruments.
4. Increase the business opportunities for the companies belonging to the cluster(s) by international business development.
5. Promote the MNE technology through the results of our cluster cooperation

DSP Valley has defined the internationalisation plan for the regions and countries beyond Europe. The main idea is to build and develop a relationship with regions beyond Europe and deploy activities to the benefit of the Silicon Europe members. Main activities are exploration, matchmaking and communication. Taiwan has been chosen as the first country to approach, the second is the USA. This plan has also been used as input for applying to the COSME call on Cluster GO International.

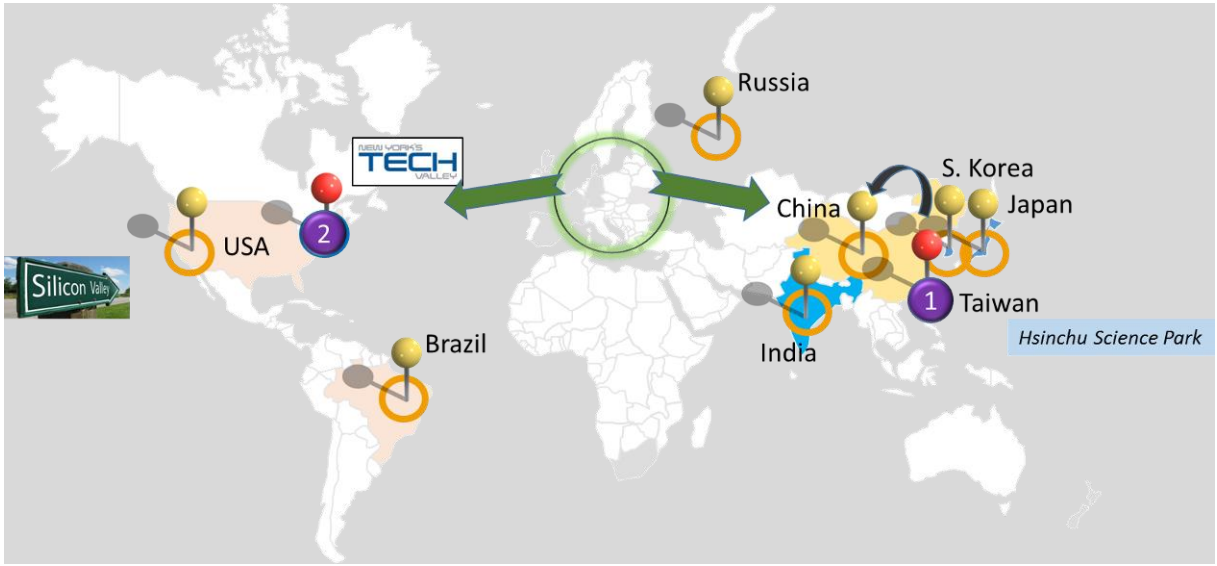


Figure 29: Overview of interesting regions

In WP5, DSP Valley has developed the financial plan to support the execution of the Joint Action Plan. It has resulted in a directory of the local, regional, national and European funding sources and other support on themes addressed by the Silicon Europe Joint Action Plan (D5.1).

The successful implementation of the JAP will strongly depend on the mutual trust and willingness of the different cluster organisations to cooperate and implement the different actions but also on the trust of the cluster members in the proposed cross-regional activities. To increase the trust level between the cluster organisations and also between the cluster members, we already started with the implementation of some activities as defined in the JAP. An overview is given in D5.2.

IV. INPUT PARTNERS TO POTENTIAL IMPACT

A. PARTNER 1, 10 – German consortium

PARTNER 1 – Silicon Saxony:

The Silicon Saxony microelectronics and ICT sector comprises around 2,100 enterprise and employs 51,000 people. The region in the triangle of the German cities of Dresden, Freiberg and Chemnitz is one of the most innovative ICT cluster in the word. Here is where one finds a unique agglomeration of enterprises and research institutions with knowhow in the fields of micro- and nanoelectronics, organic and printed electronics, energy-efficient systems, IT, telecommunications, smart systems, sensor networks and next-generation mobile technologies. The local industries benefit from the collaborative environment of science, industry and administration that has grown over the last 20 years and today is the base for leading-edge research and successful collaboration across organizational borders resulting in future technologies 'Made in Saxony' with high economical impact.

Silicon Saxony, already well known on local and regional level, has gain higher recognition on European level because of the Silicon Europe project. The expansion of the regional ecosystem to a cross-regional level will further increase the economical impact and the impact on policies.

By uniting the strong regional clusters with the new engagement in transnational collaboration the members of Silicon Saxony will have benefits from the project, e.g. easier access to members of the other participating clusters, easier exchange of information and leading innovation or easier involvement in projects and events organised by the other partners.

B. PARTNER 2, 3, 4 French consortium

PARTNER 2 – Minalogic:

For Silicon Europe clusters, and Minalogic what what it concerns us:

- Silicon Europe has assured recognition at European level for the roles that the clusters carry out in terms of acting as an intermediary between SMEs and big companies and research labs as well as with political institutions, in terms of facilitating networking and spurring collaboration and innovation and in terms of facilitating the development of companies and the European micro- and nanoelectronics industry as a whole. It is hoped that this will be clearly demonstrated in the framework of PENTA. Minalogic has clearly gained visibility at European level due to its strong implication in the project and its proactive role.
- But even more importantly Minalogic's members have clearly benefited from the project as the following testimonials demonstrate:

Nelly Kernevez | Partnership director | SOITEC

Thanks to Silicon Europe, SOITEC:

- promoted its SOI technologies at an event organized by Silicon Europe in Brussels in November 2014 with key policy-makers.
- was able to organize with the SOI consortium[1] a SOI workshop at the Silicon Saxony Day in Dresden in July 2015 which gathered 50 participants interested by the the high level panelists composed of representatives of the industry (IFX,ST, GF, NXP), universities (UCL) and the European Commission (ECSEL).

These events allowed us to highlight the strong competitive advantage that SOI represents for the European microelectronics' industry and its innovative applications (automotive, lightning, consumer…). It was all the more important in the context of Global Foundries' engagement in FDSOI22, to explain the importance that the technology has for industry in Europe.

Serge Maginot |CEO | Tiempo

The Competition/collaboration status for innovative SMEs in electronic components/systems is such that their main competitors are outside Europe, i.e. in Asia and America. SMEs could largely benefit from an increased cooperation within Europe, especially between European SMEs.

European collaborative R&D projects (ENIAC, ECSEL, ...) are clearly not adapted to SMEs (very long and heavy project submission process, heavy administrative burden, unacceptably long payment process). In such a context, the benefits of Silicon Europe for SMEs are clear: to ease collaboration between European SMEs, to help SMEs to better know the other European SMEs working in the same domain, to favour European SME networking to ease the creation of true business partnerships between SMEs, to influence European organizations (e.g., ECSEL) to adapt their project organization to SMEs (not asking for more funding here, just asking for higher efficiency)

All these benefits are available at French cluster level, why not at a European level?

Within Minalogic, there is excellent networking between the members, with a true collaborative spirit. There are also very efficient national (FUI) collaborative project submission procedures and management, well adapted to SMEs

Jean-François POLLET | VP Business Development | Dolphin

Dolphin participated in the B2B event organized by DSP Valley in June 2015, alongside 3 other Minalogic companies. The outcome of this participation was positive. We found a partner whose expertise was complementary to ours, and jointly submitted a bid for a call for tender which we won! The whole thing happened very quickly after our encounter that day. It is a small project but small

[1] The SOI Industry Consortium is a group of leading companies from the electronics industry with the mission of accelerating silicon-on insulator (SOI) innovation into broad markets by promoting the benefits of SOI technology and reducing the barriers to adoption. More information at http://www.soiconsortium.org/about-us/mission-goals-benefits.php

streams become great river! We also met a potentially interesting Dutch partner. We do enjoy these B2B events.

Ennio CAPRIA, IRT Industrial Liaison Engineer, European Synchrotron (ESRF)

The Nanoelec Advanced Characterisation Platform (NACP) was created to provide state-of-the-art characterisation services for the nanoelectronics industry, with the objective to combine the power of synchrotron X-rays and neutrons with the established nano-characterisation capabilities. This Service Platform has been established in the context of the Nanoelec Institute for Research and Technology (IRT), a Private Public Partnership funded by the French Agency for National Research (ANR) and it is a join-venture between the European Synchrotron (ESRF), the Institut Laue-Langevin neutron facility and the CEA Nano-Characterisation Platform (PFNC). The services offered by the platform are mainly oriented to wafer manufacturers, IC manufacturing companies and industries in the sector of the high reliability electronic components. Some industrial partners collaborate already with the platform, namely ST Microelectronics, SOITEC and Schneider Electrics.

In the position of new player, characterised by a very innovative offer, the NACP accessed the market in a typical technology push approach. As a consequence, one of the main need of NACP is to get in contact with further potential industrial partners in order to understand better their needs, with the aim to adapt and structure the offer consequently.

In this context of networking and market understanding the collaboration between NACP and Silicon Europe (SE) developed. Thanks to SE gigantic network we had the opportunity to approach some key player in the micro- and nanoelectronics European market. We started with the participation to an edition of the Silicon Saxony Day brokerage event in Dresden. Furthermore, we had the chance to collaborate more closely. Silicon Europe helped us promoting an Expert Panel that we are organising at SEMICON 2015 in Dresden. They helped us to diffuse the news on various channels, mainly online and in the social media. Moreover, they offered us the opportunity to be invited at the "Eighth European Semiconductor Cluster Forum" in Grenoble, an event with a selected audience from the European micro- and nano-electronics industry. We are extremely grateful to Silicon Europe, and in particular to Kate Margetts, the proactive Grenoble local point. This network was very efficient, fruitful and supporting to our activity and we would be delighted to pursue our collaboration and exchange in the future".

For local and regional authorities:

- The Silicon Europe project is well-known at local level and is often cited as an outstanding example of a European project in the Rhône Alps Region. The project has therefore influenced policy and also inspired other collaborative projects. It was for example presented - at the request of Region Rhône-Alps and on the basis of a selection by the EC - in the April 2015 **"GROW your REGIOn: Delivering Smart Specialisation and Economic Transformation through Clusters"** conference organised by the European Commission.
- It therefore allowed for increased visibility of Grenoble -which incidentally was ranked by Forbes World's Fifth Most Inventive Cities. In May 2013, the European Commission proposed a New European Industrial Strategy for Electronics. One of its key elements was about

"reinforcing Europe's three world-class electronics clusters: Dresden (DE), Eindhoven (NL) /Leuven (BE), and Grenoble (FR) and connecting with other leading edge European clusters such as in Cambridge (UK), Carinthia (AT), Dublin (IRL) and Milan (IT)".

- The role that the project has had in influencing policy is apparent at a local level but its political clout has also permitted actors from the Region Rhône-Alps' area to be heard at a national and a European level through various different paths

For the European Commission

- From our point of view the Silicon Europe project should be considered as a real success for the European Commission. Now that the project will turn into an open Alliance, it has gained a centralised access to all interesting microelectronics'clusters in Europe, which will be the voice of SMEs to the best of their knowledge in defining new strategies and implementing current roadmaps.

For the micro- and nanoelectronics industry in Europe:

- Companies are developing their international activities both within Europe and further afield. Silicon Europe has allowed for our local companies to meet with industrial players in the United States, in Taiwan, in Korea, in Russia and elsewhere in the world. This allows them the potential to develop their business, to undertake new R&D projects and, in turn to recruit more employees at a local level.
- Silicon Europe is now a central access point for international partners to a vast network of companies, labs etc. in Europe. It will hopefully keep on highlighting the strengths of our European industry.

For society:

- Micro- and nanoelectronics is a key enabling technology which permeates through all industry and society as a whole. Innovation in this industry is necessary for its growth. The growth of this industry is beneficial to society as a whole for economic reasons → spurring business transactions, providing skilled and unskilled jobs and training opportunities…
- Society as a whole can also benefit from the technology being produced. Today every person in Europe interacts with a huge number of microchips on a daily basis, from their washing machine, to their car, to street lighting or traffic lights, to paying for their groceries to playing a game or watching TV. Whether it is for entertainment, for their work, their safety or their comfort, people are using more and more electronic equipment and if this technology is not being invented and developed in Europe, it will be happening elsewhere in the world.
- Due its role as a key-enabling technology, the development of this industry also has knock-on effect for other industries that use micro- and nanoelectronics, driving their development and growth → healthcare, energy management, transport, communication… etc.

PARTNER 3 – AEPI:

For Silicon Europe clusters and the Grenoble local ecosystem, which has indeed in France been a role model and a framework for elaborating the national cluster policy, and where AEPI has always been

completely connected in the strategy of local clusters, and particularly Minalogic, the project has indeed brought official recognition at European level for the role clusters, and all their components, including local government, play in the implementation of European strategy, smart specialization and support to SMEs.

For AEPI it was also an opportunity to connect local economic development policies with the global strategy of its local enterprises and to really have a hands on approach and intimate knowledge of the companies issues and strategy.

For the local companies, research organization or education partners, it was a very positive signal that the policy makers were supporting them in their global strategy, and understood all the complexities of the electronics sector landscape.

For local and regional authorities:

- The Silicon Europe project is well-known at local level and is often cited as an outstanding example of a European project in the Rhône Alps Region. The project has therefore influenced policy and also inspired other collaborative projects. It was for example presented - at the request of Region Rhône-Alps and on the basis of a selection by the EC - in the April 2015 **"GROW your REGIOn: Delivering Smart Specialisation and Economic Transformation through Clusters"** conference organised by the European Commission.
- It therefore allowed for increased visibility of The Grenoble- ecosystem -which incidentally was ranked by Forbes World's Fifth Most Inventive Cities. In May 2013, the European Commission proposed a New European Industrial Strategy for Electronics. One of its key elements was about "reinforcing Europe's three world-class electronics clusters: Dresden (DE), Eindhoven (NL) /Leuven (BE), and Grenoble (FR) and connecting with other leading edge European clusters such as in Cambridge (UK), Carinthia (AT), Dublin (IRL) and Milan (IT)". (which is currently being discussed as implementation of the Action Plan and follow up of the project)
- The role that the project has had in influencing policy is apparent at a local level but its political clout has also permitted actors from the Region Rhône-Alps' area to be heard at a national and a European level through various different paths

For the European Commission

- From our point of view the Silicon Europe project should be considered as a real success for the European Commission. Now that the project will turn into an open Alliance, it has gained a centralised access to all interesting microelectronics' clusters in Europe, which will be the voice of SMEs to the best of their knowledge in defining new strategies and implementing current roadmaps.
- It has also been "tested out" at a non-European level and has raised a lot of interest in Taiwan, which is involved in a high number of collaboration programs in IT and electronics as well as having just installed an E.E.N point of contact. It has as well raised very positive awareness in the US, Russia as well as in Korea. In these countries, the support of the European Commission is always seen very positively.

For the micro- and nanoelectronics industry in Europe:

- Companies are developing their international activities both within Europe and further afield. Silicon Europe has allowed for our local companies to meet with industrial players in the United States, in Taiwan, in Korea, in Russia and elsewhere in the world. This allows them the potential to develop their business, to undertake new R&D projects and, in turn to recruit more employees at a local level.
- Silicon Europe is now a central access point for international partners to a vast network of companies, labs etc. in Europe. It will hopefully keep on highlighting the strengths of our European industry as well as hopefully bring in potential investors which might help the development of our SMEs or start-ups or integrate European technologies into their offer, thus bring European top notch technology inside mass market products.

For society:

- Micro- and nanoelectronics is a key enabling technology which permeates through all industry and society as a whole. Innovation in this industry is necessary for its growth. The growth of this industry is beneficial to society as a whole for economic reasons → spurring business transactions, providing skilled and unskilled jobs and training opportunities…
- Society as a whole can also benefit from the technology being produced. Today every person in Europe interacts with a huge number of microchips on a daily basis, from their washing machine, to their car, to street lighting or traffic lights, to paying for their groceries to playing a game or watching TV. Whether it is for entertainment, for their work, their safety or their comfort, people are using more and more electronic equipment and if this technology is not being invented and developed in Europe, it will be happening elsewhere in the world.
- Due its role as a key-enabling technology, the development of this industry also has knock-on effect for other industries that use micro- and nanoelectronics, driving their development and growth → healthcare, energy management, transport, communication… etc.
- The development of microelectronics, and more broadly, whole electronics systems, is also key for what is now widely termed as smart cities, or the digitalization of the society, and the availability of new services hopefully accessible as well to elderly or disabled people, and this at affordable costs. This advocates furthermore the interaction with local policy makers and local authorities, as they are the closest to the needs of the citizens.

<u>PARTNER 4, 11 – Grenoble:</u>

For the micro- and nanoelectronics industry in Europe:

- Companies are developing their international activities both within Europe and further afield. Silicon Europe has allowed for our local companies to meet with industrial players in the United States, in Taiwan, in Korea, in Russia and elsewhere in the world. This allows them the potential to develop their business, to undertake new R&D projects and, in turn to recruit more employees at a local level.

For clusters:

- Silicon Europe has assured recognition for the roles that the clusters carry out in terms of acting as an intermediary between SMEs and big companies or SMEs and political institutions, in terms of facilitating networking and spurring collaboration and innovation and in terms of facilitating the development of companies and the European micro- and nanoelectronics industry as a whole

For local authorities:

- The Silicon Europe project is well-known at local level and is often cited as an outstanding example of a European project in the Rhône Alpes Region. The project has therefore influenced policy and also inspired other collaborative projects.
- The role that the project has had in influencing policy is apparent at a local level but its political clout has also permitted actors from the Grenoble area to be heard at a national and a European level through various different paths
- The project has also allowed for relations to be developed between the regions participating in the project and for the prospect of Europe-wide mutual understanding of the Silicon Europe project and common policy to be envisaged

For society:

- Micro- and nanoelectronics is a key enabling technology which permeates through all industry and society as a whole. Innovation in this industry is necessary for its growth. The growth of this industry is beneficial to society as a whole for economic reasons spurring business transactions, providing skilled and unskilled jobs and training opportunities…
- Society as a whole can also benefit from the technology being produced. Today every person in Europe interacts with a huge number of microchips on a daily basis, from their washing machine, to their car, to street lighting or traffic lights, to paying for their groceries to playing a game or watching TV. Whether it is for entertainment, for their work, their safety or their comfort, people are using more and more electronic equipment and if this technology is not being invented and developed in Europe, it will be happening elsewhere in the world.
- Due its role as a key-enabling technology, the development of this industry also has knock-on effect for other industries that use micro- and nanoelectronics, driving their development and growth healthcare, energy management, transport, communication… etc.

C. PARTNER 5-6-7 – Dutch consortium

For the Dutch partners the potential impact of the project derives mainly from the collaborative relationships with the other regions that have been strengthened. Within the Dutch regions for instance, for the first time in history the partners Oost NV and NV BOM as well as the Dutch semicon clusters BCS and High Tech NL have become engaged in collaboration with partner regions in Germany, Belgium and France. Through the project and the resulting Silicon Europe Alliance, they

have acquired the capacity to serve as matchmakers for the semicon industry in their respective regions.

The fact that High Tech NL participated in the Silicon Europe project provided the opportunities to successfully join two European projects in the support of the internationalisation ambitions of High Tech NL. The first project being EURO-CPS as part of the European Smart Anything Everywhere Initiative to bring cyber physical systems to a broad SME-audience. The second project being ECSIP under COSME to further support cluster activities beyond Europe.

Inspired by the Silicon Europe project, High tech NL and 5 official regional Development agencies including BOM And Oost NV in NL have signed a strategic Cooperation document to Work together for research, innovation and New business creation Projects in both national and European context. Semicon Equipment and components and circuits are very important topics here and joint workshops and network activities are foreseen for 2016-2020 timeframe. On a national level this strategic cooperation aims at introducing e.g. start-ups and SMEs to innovative projects and cluster-formation. Here the cluster organisations HTNL and BCS will act as the gateway to international (European) projects and to find suitable EU-partners through the Silicon Europe Alliance. In particular the regional development agencies will introduce high potential start-ups and innovative SMEs to international projects and events in the semicon domain. Additionally, the coupling between the semicon domain and e.g. photonics as well as cross-overs with application markets as agrifood, health, mobility, energy and security will be made. An important aspect here is the Internet of Things that requires much “high tech inside”. BOM and Oost NV give this aspect a lot of attention, in particular via their respective investment policies. The Silicon Europe project has raised the awareness at the companies that “high tech inside” is essential for future success in a full value chain approach.

High Tech NL is currently developing a project to bring Dutch semiconductor related companies in contact with German companies in order to create cross-border collaborations. This activity will be supported by the Dutch Ministry of economic affairs, the Dutch embassy in Germany and will involve the Silicon Europe alliance partners during the execution of the project.

A dissemination activity Oost NV has embarked on is the matching of semicon companies to German partners in the process of Horizon 2020 consortium building.

D. PARTNER 8, 9 – Belgium consortium

A recent study (NE4FT Technology Roadmap Sept 2014) revealed that the MNE industry is one of the sectors in Flanders that experienced an important growth rate of 60% over the last decade. Most likely because it is also the sector that invested the most in innovation and research. With its 290 companies and more than 22.000 employment it generates an economical added value of almost 3 B€ per year. As a result of the Silicon Europe project this economical impact should further increase by enlarging the size of the ecosystem to a cross-regional level.

In practice it means that for companies belonging to the regional cluster, the scope of their cluster is virtually enlarged to the pan-European meta-cluster level.

As such companies can have easier access to a larger network: from +100 to +800 companies. Secondly companies can be easier involved in activities organised in other Silicon Europe clusters.

DSP Valley companies have been involved already from an early stage in the Silicon Europe cross-cluster collaboration. As a result, DSP valley companies have been participating in several events organised by one of the other clusters and companies from the other clusters have been participating in events organised by DSP Valley.

In the context of the internationalisation beyond Europe, DSP Valley was a strong driver behind a fact finding mission to Taiwan organised in September 2015. As a result, Silicon Europe is now known to the Taiwanese stakeholders as the entrance point to Europe in the area of micro- and nanoelectronics. Agreements for next steps in order to further deploy the relationship have been made.

DSP Valley has strongly supported the initiative to involve Silicon Europe in the new funding initiative PENTA. By being the interface to the SME's, Silicon Europe will enable more SME's to participate in European projects.

The direct impact from the Silicon Europe project is the extension of the regional ecosystem to the pan-European ecosystem of the participating clusters in the first place and to other European clusters. With the execution of the subsequent JAP world-wide expansion of the ecosystem will be achieved. This enables the members, and especially SME's, to assist to international activities and events such as matchmaking, workshops and exhibitions. Several DSP Valley members including SME's took part in these events with additional agreements for business development as result. These events are listed in Table 18: Regional events attended by DSP Valley members

The impact on turnover and employment will be visible later on. Even so important will be the new opportunities created for foreign investors to invest in Flemish companies. This still has to be concretised.

Opening up of regional events towards the members of the other cluster organisations:

Date	Organiser	Location	Topic
Sep 2013	Minalogic	Grenoble	Minalogic labs present their R&D offers (A2B)
Mar 2014	HTNL	Den Bosch	Semicon in Europe workshop http://www.hollandhightech.nl/htsm/Agenda/Agenda_2014/Semicon_in_Europa
Jun 2014	DSP Valley	Leuven	B2B Forum
Dec 2014	Minalogic	Grenoble	B2B
July 2014	SiSax	Dresden	Silicon Saxony Day
Oct 2014	DSP Valley	Mechelen	Smart Systems Industry Summit
Jun 2015	DSPV	Leuven	B2B Forum
Jul 2015	SiSax	Dresden	Silicon Saxony Day
Oct 2015	DSPV	Mechelen	Smart Systems Industry Summit

Table 18: Regional events attended by DSP Valley members

Specific dissemination activities attended by DSP Valley:

Date	Event	Location	Topic
Oct 2012	Semicon Europe 2012	Dresden	Silicon Europe booth
Mar 2013	DATE	Grenoble	Silicon Europe session
May 2013	INC9 http://www.inc9.de/index.php?id=program	Berlin	Silicon Europe session
Oct 2013	Semicon Europe 2013	Dresden	Silicon Europe booth
Mar 2014	Smart Systems Integration Conference	Vienna	Silicon Europe booth
May 2014	Embedded Systems	Den Bosch	Silicon Europe booth
Jul 2014	Semicon West 2014	CA-US	Silicon Europe booth
Sep 2014	Semicon Taiwan 2014	Taipei	Workshop in cooperation with ECCT
Oct 2014	Semicon Europe 2014	Grenoble, FR	Silicon Europe booth Silicon Europe open creative breakfast
Dec 2014	Semicon Japan 2014	Tokyo, JP	Silicon Europe poster
Jul 2015	Semicon West 2015	San Francisco, CA, USA	Silicon Europe poster on European pavillon Meetings with US NY Albany nanotech Cluster
Sep 2015	Semicon Taiwan 2015	Taipei	Workshop in cooperation with ECCT
Oct 2015	Semicon Europe 2015	Dresden	Final workshop & reception

Table 19: Common presence on international fairs

Silicon Europe participated in several events in order to promote the Silicon Europe vision and mission:

Date	Event	Location	Topic
Since 2013	ESCF	alternating	Participation in the Bi-annual meetings
Nov 2013	Smart Specialisation Workshop	Brussels	Participation
May 2014	Smart Specialisation Workshop	Vienna	Participation with a presentation
Jun 2014	DTC Catrene Workshop	Grenoble	Participation with a presentation
Nov 2014	Policy Workshop	Brussels	Organisation of workshop
Mar 2015	Smart Anything Everywhere http://europefranceforum.insight-outside.fr/index.php?langue=en&onglet=5&acces=&idUser=&emailUser=	Grenoble	Participation with a presentation

Table 20: Dissemination activities with international impact