



EUREKA Clusters

Essential instruments for
global competitiveness



FOREWORD

During our 12-month tenure, we had a number of strategic priorities for the Chairmanship, but these priorities had one common thread. And that was coopetition. For me, nothing better embodies coopetition than what is achieved by the EUREKA Clusters: a perfect blend of international R&D cooperation, with a competitive spirit. Coopetition happens in the Clusters because project partners - from big industry to SMEs and academia, know that they will reach a higher value result by working together.

The value of such coopetition transcends the competitive differences between these individual partners, helping to ensure that Europe maintains its global leadership in areas of existing strength, and enhancing its position in emerging technology-driven markets. Equally important, it helps shape the formulation and adoption of common standards, and promotes the interoperability of products. EUREKA Clusters show how public-private partnerships can produce breakthroughs in high technology sectors of significant economic and social importance to Europe. Such a strategic approach continues to be crucial to the development of a strong and coherent European Research Area and to future competitiveness and employment opportunities in a globalised economy.



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SUMMARY

EUREKA Clusters

Essential instruments for global competitiveness

EUREKA (www.eurekanetwork.org) was established in 1985 to foster European R&D cooperation, to strengthen the competitiveness of European industry, based on the national priorities of its member countries. Aside from developing EUREKA individual projects, Umbrellas¹ and the Eurostars Programme², which each offer opportunities to smaller consortia with fewer partners to develop innovative technologies, EUREKA also understood that **a focus on business-oriented innovation in major high-technology domains** was critical to maintain the competitiveness of European industry.

And so, in 1987, JESSI, the first EUREKA 'strategic initiative', later to be known as a 'EUREKA Cluster', was born. Its success led to the endorsement of further Clusters by the EUREKA High Level Group representing all member countries. There are currently seven such Clusters, addressing domains as diverse as ICT (telecommunications, software and services, nano-electronics and electronic systems), energy, water and manufacturing technologies.

Together, these EUREKA Clusters now represent 70% of the budget of the EUREKA portfolio and in total have leveraged some 14.9 billion euro in R&D efforts since EUREKA's inception.

Created by industry, managed as a business and involving all R&D&I actors (industry, SMEs, research institutes and universities, and other private and public organisations) in close coordination with member countries and the EUREKA network, the **EUREKA Clusters are**

flexible and can respond rapidly to new opportunities in a constantly-evolving business and societal landscape.

EUREKA Clusters report **numerous success stories** and thereby create **a positive socio-economic impact**. Through their **light and flexible structure**, the Clusters welcome partners from within and beyond Europe – and allow **an increased participation of SMEs**, which now represents some 30% in terms of human effort expended, the other participants being larger companies and research institutions.

EUREKA Clusters enable their project partners to continue to innovate in Europe - and to commercialise their products and services in the global market.

Focusing on the global competitiveness of industry in a specific domain, and in close coordination between industry and national public authorities leveraging national strategic priorities, **EUREKA Clusters are complementary to other European initiatives**. These initiatives are more oriented to general research and innovation, whereas EUREKA Clusters clearly focus on short to medium term market impact.

EUREKA Clusters are continuously monitoring the changing industrial and societal landscape and anticipate the future through a clear definition of vision, mission and strategy in their specific domain. In addition, their flexible 'bottom-up approach' allows industry to adapt its projects whenever needed. EUREKA Clusters are active participants in the EUREKA network and communicate and cooperate with each other through regular inter-Cluster activities. They also cooperate with other R&D initiatives in their sector (e.g. JTIs, PPPs, etc.).

The continuous growth and development of EUREKA Clusters, strongly supported by the European industry, EUREKA High Level Representatives and public authorities of participating members, have made the Clusters what they are today: essential instruments for the global competitiveness of European industry.

¹ Thematic networks in a specific technological area, which serve as an important tool for promotion and generation of individual projects. For more information, please see: www.eurekanetwork.org/programmes/umbrellas

² A joint EU-EUREKA funding programme targeting research-intensive SMEs (www.eurostars-eureka.eu)

Chapter 1

What is a EUREKA Cluster?

This text introduces, describes and highlights EUREKA Clusters, which are strategic initiatives within the EUREKA network. EUREKA Clusters are focused on business-oriented innovation in a specific domain. The word 'cluster' is often used in the context of regional clustering, but this is not the same as EUREKA Clusters. EUREKA Clusters create international eco-systems of R&D actors in given technological domains and are not restricted to a geographical area.

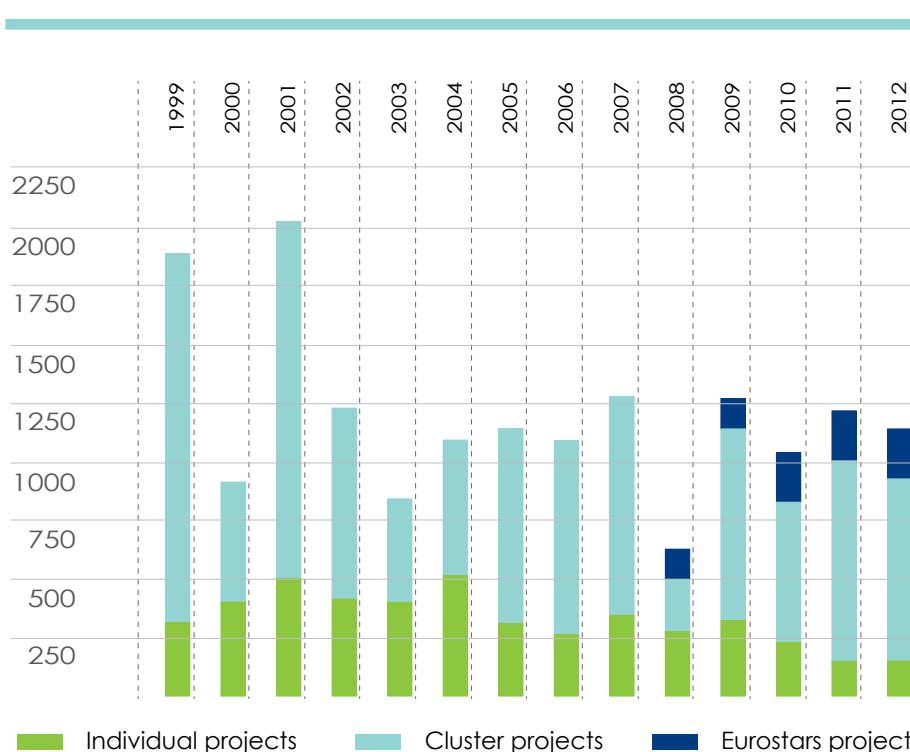
EUREKA Clusters are strategic initiatives proposed and led by industry, developing generic technologies of key importance for European competitiveness. Clusters facilitate R&D and innovation projects on the basis of a broad industrial participation spanning large industry and SMEs as well as research institutions and other public or private organisations.

EUREKA Clusters are a EUREKA success story. In terms of project funding, they represent more than 70% of the EUREKA portfolio. They feature a high industrial participation, with a considerable – and increasing – level of SME participation (between 30% and 50%). The success of the Clusters is due to their flexibility, enabling companies to share their pre-competitive R&D and innovation efforts through international cooperation. Moreover, member countries choosing to support a company in their country have the opportunity to align this support with their national priorities (variable geometry).

EUREKA Clusters clearly reflect synergies where European industry, research and collaboration interests, innovation capacity and national funding opportunities meet.

Clusters are part of EUREKA and contribute to its major objective: to coordinate and foster private and public investment in cooperative industrial R&D&I in Europe, towards a sustainable European competitiveness.

Total project cost per year / M€



'a hint to SMEs keen to participate in Cluster projects: don't be too shy. SMEs have their place inside such projects, which big players recognise.'

Frederik Loeckx - CEO TRIPHASE

PROJECT ITEA MODELISAR

DURATION 42 months

COST 27 Million Euros

COUNTRIES Austria, Belgium, France, Germany, Sweden

DESCRIPTION

As our electronics-filled cars become increasingly sophisticated, engineering-focused automakers turn software developers.

EUREKA Clusters have created together with their partners (large companies, SMEs, research organisations, academia) and with the strong support of public authorities from EUREKA member countries, an important organisational R&D&I ecosystem and a unique network for pan-European cooperation, which is ready to meet new challenges, and to enhance the global competitiveness of European industry in many domains.

The bottom-up approach and the flexibility embedded in EUREKA and in its Clusters allow industry to react quickly and efficiently to changing parameters; this approach is compatible with market change, so that innovation can always be at the leading edge, while still allowing for fast market deployment.

As in all EUREKA Clusters organize themselves bottom-up to best reflect their individual scope, members and goals. Most EUREKA Clusters have formed a legal entity (e.g. an industrial association of stakeholders) as governing body and have a number of formal agreements that constitute the framework for network co-operation and lay down the rights and obligations of participants. All EUREKA member countries as well as Associated Countries are entitled to participate in all EUREKA Clusters (no exclusivity). Whenever seen as relevant by the project partners, participants from countries who are not members of EUREKA can also be invited to join.

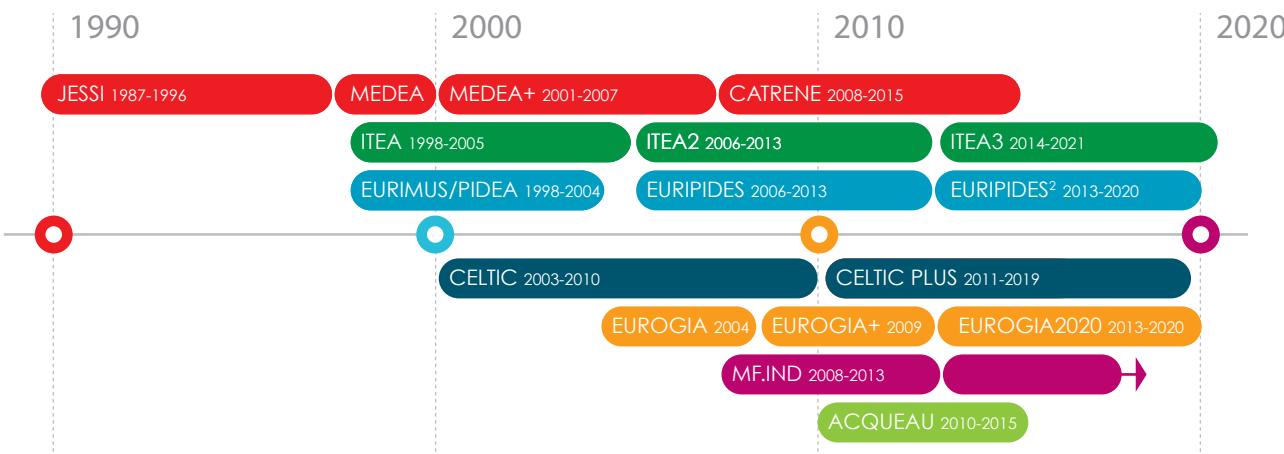
'the EUREKA Label enabled us to put together the consortium faster and with less effort than under the EU framework programme.'

Christian Val - CEO 3D Plus

PROJECT PIDEA WALPACK
DURATION 36 months
COST 34 Million Euros
COUNTRIES France, UK

DESCRIPTION
Combining electronic components in a single 3D package is driving increased miniaturisation in key European markets.

EUREKA Clusters in 7 domains since 1987 (status June 2013)



In a nutshell

A EUREKA Cluster initiated by industry and dedicated to a specific domain, allows efficient cooperation, focusing on clear objectives and market opportunities (bottom up approach);

A EUREKA Cluster creates a network for R&D&I actors, allowing for closer exchanges and opportunities for cooperation;

A EUREKA Cluster initiates projects which are organized by R&D&I actors via an efficient process for project proposal, evaluation and monitoring, in consultation with the public authorities of EUREKA member countries;

A EUREKA Cluster provides continuous project monitoring, which leads to improved quality and to the optimisation of value creation;

The organization of a Cluster project allows for the flexibility necessary to adapt to a rapidly changing European and global research landscape;

A EUREKA Cluster which receives the constant support of national public authorities within the EUREKA framework, leverages national priorities in the global market place, required for European industry to succeed.

Chapter 2

Why European industry needs EUREKA Clusters

EUREKA Clusters play an important role in their respective technological domains in a global perspective, too. Over the last decades, national economies have seen major changes in relation to a more global and open market, as well as increased competition between regions (Europe, US, Asia/Pacific...). For companies, these evolutions have led to more opportunities (larger potential markets) but in a tougher and more competitive environment.

At the same time, products with technological content have seen impressive evolutions over the last decades. The black and white television set of the 1960s has been replaced by an interconnected full high-definition flat colour screen television and today can even offer 3D images in your living room. Such evolution requires more and more R&D efforts that converge around multiple technological domains, with an increasing pressure to reduce time to market.

Some examples of Cluster projects that have helped to maintain a competitive position in parts of the TV-related market are :



HDTVNext

JEDI

ACDC

APPSGATE

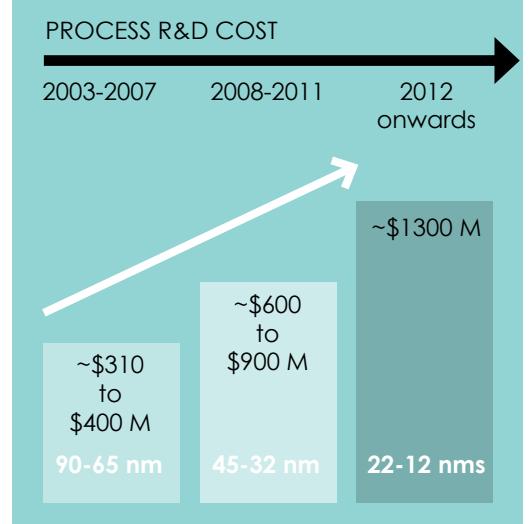
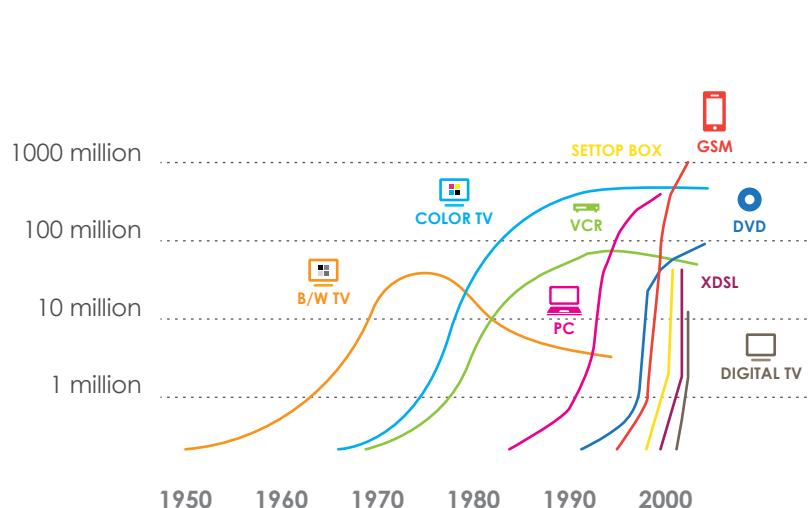
DEVELOPING THE FULL HD BROADCAST CHAIN - FROM PROFESSIONAL BROADCAST STUDIO TO CONSUMER HOME TV

BLU-RAY 3D QUALITY BROADCASTS - MASTERING THE COMPLETE END-TO-END TRANSMISSION CHAIN

CLOUD COMPUTING TO MANAGE RESOURCE HUNGRY VIDEO CONTENT DISTRIBUTION

AIMS AT DEVELOPING AN OPEN PLATFORM TO PROVIDE INTEGRATED HOME APPLICATIONS TO THE CONSUMER MASS MARKET

Examples of increased pressure to reduce time to market and increased R&D&I effort for the semiconductor industry



Europe has maintained a leading position in many industrial domains. However, over time, it has become increasingly challenging for individual companies to sustain such rapid evolutions alone while maintaining their competitiveness.

With this in mind, cooperation as implemented by the EUREKA Clusters, has become and remains essential in order to:

- accelerate the introduction of R&D&I results to the market;
- share research and development costs and results;
- provide access to other technologies and experts with complementary skills;
- create a network for long term win-win collaboration.

Through EUREKA, industry and R&D&I actors can set up simple and light organisations via Clusters in direct contact with public authorities.

The first Cluster-like organisation, called JESSI, was set up in 1987 in the microelectronics domain. As a result of this first success, EUREKA now has Clusters in a total of seven different domains.

New and complementary Cluster initiatives, when jointly initiated and supported by industry and member countries, are always welcome, for the benefit of all players involved.

'the project has helped to reinforce the productivity of the European foundry industry.'

Jean-Marc Morel - Software Engineering Manager BULL

PROJECT ITEA PARMA

DURATION 36 months

COST 14 Million Euros

COUNTRIES France, Germany, Spain, United Kingdom

DESCRIPTION

This project brought together European computer specialists to enable the development of an integrated set of programming methods required to harness the power of the latest multicore processor architectures, essential for European research and industrial production.

Why such a success for EUREKA Clusters?

Through the EUREKA Clusters, considerable project funding has been mobilised which generated direct advantages for industries involved – as well as for the supporting member countries.

The Cluster model originated in the interests of industry to further leverage R&D&I efforts, with a focus on specific domains, and from the willingness of some European countries to promote European-wide R&D and innovation together with their own strategic priorities. It has proven to be so successful, because it meets the interests of both private and public R&D actors.

As a result of EUREKA Clusters achievements, all R&D actors (large companies, SMEs, research organisations, universities) benefit from a balanced representation within the projects. EUREKA Clusters have recorded a regular increase of non-corporate organisations with more than 50% of the effort in projects coming from SMEs, research organisations and universities. In particular, SMEs have reached an average level of 30% in human effort.

In addition, the activities of EUREKA Clusters have facilitated international cooperation beyond Europe, bringing further expertise and opportunities to European partners.

'to prove that our technology could work it was necessary to engage in cooperative research with the best in class European players in the field. This is what our project allowed.'

Gerard Matheron - GROUP VP STMicroelectronics

PROJECT CATRENE REACHING22

DURATION 36 months

COST 49 Million Euros

COUNTRIES Belgium, France

DESCRIPTION

The project will allow the European Industry to build electronic nodes only 20 to 22 nanometers wide, and will also strengthen the position of the European Academics in the exploration of even smaller nodes.

EUREKA Clusters in the European landscape

Other useful instruments exist in order to support R&D actors both at national and European level.

Instruments such as the EU Framework Programmes cover a large scope of activities and are guided by global strategic plans in a top down approach. The Seventh Framework Programme, for example, supports joint cross-thematic approaches to research subjects of common interest such as health, food, ICT and energy, and so will Horizon 2020.

The introduction of Joint Technology Initiatives (JTIs) by the European Commission some years ago resulted from the necessity to support, more intensively, R&D in specific domains as is the case for EUREKA Clusters. The existence of such complementary funding tools in Europe reflects the current needs of R&D&I actors, in line with member country and EUREKA High Level Representative objectives.

The strength of the EUREKA Clusters today is that they are the only initiatives directly managed by R&D&I actors in regular contact with the EUREKA governance bodies and national public authorities and which also focus on specific domains. At the same time, EUREKA Clusters are light in administration and flexible and can thus address more directly and more efficiently the needs of R&D&I actors.

National priorities and European vision

EUREKA Clusters allow the leverage of national priorities within a European framework. For example, when Europe is leading in a domain, it is often via a few leaders in a limited number of countries. Through European cooperation in EUREKA Clusters, national leaders can work with and share knowledge with experts outside of their own countries while reinforcing the success of national priorities. Such cooperation has positive results such as long-term working relationships in R&D or even in a win-win supplier/customer relationship.

Chapter 3

EUREKA clusters, 25 years of success and impact

To measure the impact of Clusters, the size of the Clusters in terms of R&D effort and budgets is indicated in the table below.

Large companies are the main participants in terms of budget effort, whereas SMEs are the main participants in terms of consortium partners. In 2012, large companies accounted for 63% of budget efforts in CATRENE; 45% in ITEA2 and 44% in Celtic-Plus. SMEs represent 42% of the participants in CATRENE, 52% in ITEA2, 33% in Celtic-Plus and 40% in EURIPIDES. Universities and research institutes accounted for 25% of the budget effort in general and approximately the same in terms of number of consortium partners.

'we invest heavily in R&D to keep our market lead and we like cooperative programmes for complex innovation.'

Patrice Plessis - Government affairs and Standards Director GEMALTO

PROJECT MEDEA+ BIOP@SS

DURATION 26 months

COST 23 Million Euros

COUNTRIES France, Czech Republic, France, Germany, Hungary, Sweden

DESCRIPTION

Digital security specialists, major European electronics makers, and experts in biometrics worked together to make passport control at airports faster. The technology also could have broader applications on the way our identity documents are designed and on the way we access public services.

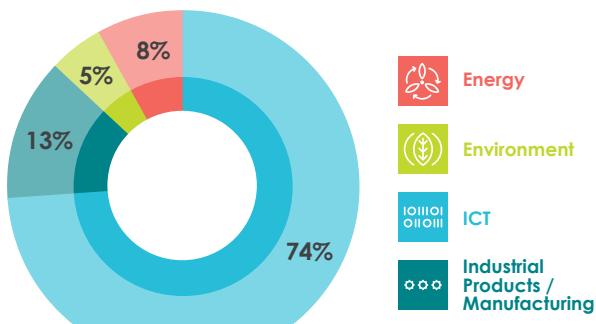
EUREKA CLUSTERS

Summary project data
status February 2013

	3 years	COMPLETED projects end 2012			RUNNING projects end 2012			LABELLED projects in 2012		
		#projects	efforts [PY]	budget [M€]	#projects	efforts [PY]	budget [M€]	#projects	efforts [PY]	budget [M€]
	ACQUEAU	0			4	N/A	20	3	N/A	10
	CATRENE	9	2,714	542	28	5,108	1,020	5	925	185
	Celtic-Plus	78	4,593	484	29	2,118	285	12	1,131	128
	EURIPIDES	29	1,660	208	19	1,143	148	7	271	34
	eurogia+	2	13	3	12	244	61	5	100	25
	ITEA2	44	5,684	599	32	4,668	488	18	2,583	255
	ManufactureSigmaIndustry	1	9	0.65	2	369	31	5	374	36
	TOTAL	163	14,673	1,836.65	126	13,350	2,053	55	5,384	673

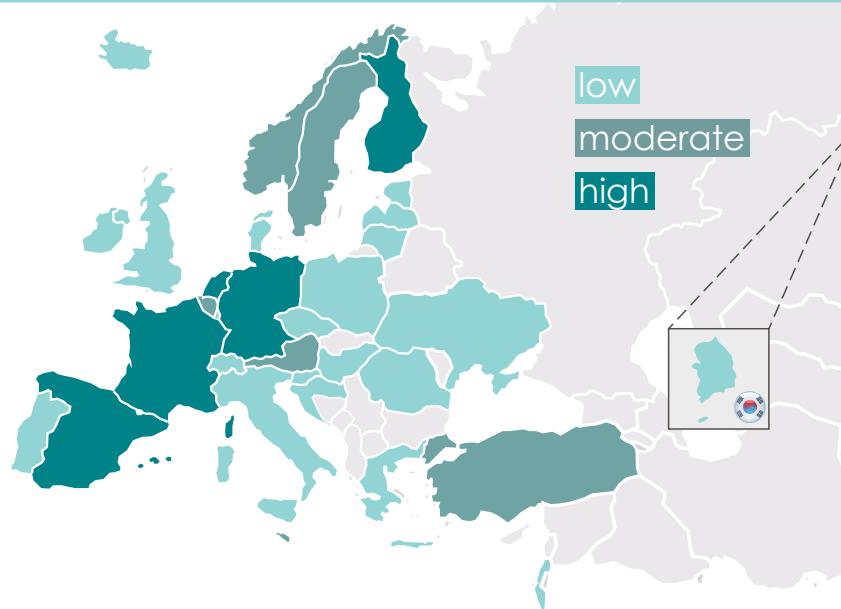
In terms of technological areas, Cluster projects have a strong focus on information and communication technologies (ICT), which makes up 74% of the portfolio. Industrial technologies make up 13% of the portfolio, energy 8% and environment projects 5%.

Cluster projects approved in 2012 By technological areas



In terms of member country participation, France is the main contributor (41% of budget), followed by the Netherlands (18%), Germany (12%), Finland (8%), Spain (8%), Belgium (4%) and Austria (2%). Turkey and South Korea both show increasing participation in recent years. The map below shows the countries' participation in terms of project costs including all approved projects of the Clusters currently running.

Member country participation Participation intensity



Impact of EUREKA Clusters on revenue and employment

Nano-Electronics (Cluster CATRENE) and Professional Electronics (Cluster EURIPIDES) are an enabling technology and a propulsive sector directly contributing to at least 10% of the world gross domestic product (GDP). Europe has a strong position in professional embedded electronic systems. This position depends on European excellence amongst a number of industrial leaders, such as high-performing technology for aerospace, healthcare, transport and high technology with best cost due to high volume in automotive, industrial engineering, machinery and energy. The electronics industry today employs about 2.5 million people in Europe. This major industry will grow nearly twice as fast, over the coming years, as the total world GDP.

ICT (including also the Clusters ITEA 2 and Celtic-Plus in addition to the two mentioned above) is being applied successfully in many economic and societal key areas. According to the Joint Research Centre (JRC) 2011 report on R&D in ICT in the European Union, the ICT industry – and ICT enabled innovation in non-ICT industries and services – make an increasingly important contribution to the economic growth of advanced economies. An industry strong in ICT-based innovations creates high-value jobs in ICT and in other, more traditional industries that are dependent on ICT. According to the 2012 PREDICT report, in 2009 the ICT sector Value Added in the EU amounted to 470 billion euro representing 4% of EU GDP. Over 6.1 million people worked in the EU ICT sector, representing 2.7% of employment in the EU. Furthermore, the report states that ICT R&D personnel made up 4.7% of total ICT employment in the EU.

The water sector has a fundamental and vital benefit for society, but is also a major economic asset. The world market for drinking and waste water has reached over 300 billion euro and corresponding investments represent more than 33 billion euro annually. It also makes a large social impact involving 600,000 jobs in Europe. ACQUEAU is the EUREKA Cluster on water technologies.

The energy industry, which is the focus of EUROGIA2020, represents about 10% of world GDP. According to the International Energy Agency, annual investment in energy supply infrastructure alone represents more than 1 trillion dollars, and is poised to increase further, with an annual average of 1.6 trillion dollars expected between now and 2035. The energy sector plays a key role in economic growth and recovery. It employs over 1.2 million persons in EU countries, representing 3% of the total industrial workforce. (Eurostat 72/2009)

The manufacturing sector is vital: in Europe alone, it has a yearly turnover of 6400 billion euro, employing over 100 million people, directly or through related services. Manufactured goods amount to 80 % of exports and over 400,000 researchers and innovators are active in manufacturing-related activities. There is increasing recognition of manufacturing's fundamental role for European recovery and a more sustainable growth globally. MANUFUTURE INDUSTRY (MF.IND) is the EUREKA Cluster on manufacturing.

Results of a recent impact assessment¹ show that the average additional turnover generated by €1 million euro of public funds invested in a EUREKA Individual Project is 9.5 million euro, and that the same 1 million euro of public funds helps creates or saves 37 direct jobs (see table on the right).

Taking the overall costs of Clusters-funded projects of 14.9 billion euro - and using the estimated 50% rate of public funding as in the EUREKA Individual Projects instrument, gives an estimated total of 7.4 billion euro of public funds invested in Clusters projects. Extrapolating the effects of 1 million euro of public funds to this total gives approximate impacts for Clusters projects since 1985 of over 270,000 jobs created and 70 billion euro additional turnover generated.

Clusters figures: since 1985

Data based on participant self-reporting in reports submitted directly to the EUREKA Network.

Total project costs for Clusters projects	14.9 billion euro
Public funds	7.4 billion euro
Leverage effects of € 1 million of public funds as calculated in the 2011 EUREKA Impact Assessment Report	
On additional turnover generation	9.5
Estimated effect on direct jobs	37.1
Clusters: estimated jobs saved & created	270,000
Clusters: estimated additional turnover generated	70 billion euro

'EUREKA and CATRENE were key to establishing a very strong consortium in which we were able to go beyond the project's original goals and push further forward state-of-the-art in our field.'

Dr Philippe MEUNIER - Group Manager NXP Semiconductors

PROJECT CATRENE PANAMA

DURATION 45 months

COST 33 Million Euros

COUNTRIES Belgium, France, Israel, The Netherlands, Spain

DESCRIPTION

in our connected world, radio signals are more important than ever. Transmitters and amplifiers able to convert low-power signals into much larger ones will be developed through this project for the european telecoms, internet and aerospace industries.

¹ Working groups of the EUREKA Israeli and Hungarian Chairmanships (2010–2012) and econometric impact studies conducted by academic and other outside experts during that time

Chapter 4

How EUREKA Clusters address new economic and societal challenges

There is wide consensus that the period from now to 2030 will be one of transformation. It is imperative for all major players in technological sectors to find the right innovative solutions to tackle future economic and societal challenges and anticipate change. New enabling technologies such as those developed by EUREKA Clusters will be essential to adapt our societies to the world to come.

Digital society

In the period leading to 2030, the development of a digital society will remain an important factor of globalisation, giving way to a knowledge economy decoupled from geographies. Timely, easy and reliable access to data is a prerequisite for this new economy. Traffic growth will be drastically increased by cloud, mobile, and streaming services, the emergence of the 'Internet of Things' and the nearly real time processing of huge amounts of data. This is why near future information and communication technology (ICT) will require infrastructures that are able to handle an exponential growth of traffic. New ICT will be essential to the creation of knowledge and to the safeguard of European heritage in a digitalised form, while making all this data more secure.

'The 4GBB project will help the European Union live up to its ambition to provide to 50% of households an internet access of at least 100 MB/S as specified in the EU Digital Agenda.'

Henrik Almeida - Manager DSL Technologies ERICSSON

PROJECT CELTIC 4GBB
DURATION 48 months
COST 8 Million Euros
COUNTRIES Sweden, France, Netherlands, Spain, Turkey, United Kingdom

DESCRIPTION
In the near future, Internet and mobile users could expect a much faster, better and cheaper online experience thanks to a research project called 4th Generation Broadband - 4GBB.

Globalisation and demographic change

Through the emergence of information technologies the world market will become ever more globalised, offering European companies more opportunities for increase in sales and benefits outside the continent. But it will also be more intensely competitive, with European home markets being increasingly targeted by Asian and American competitors and companies from emerging countries. The increased share of the world population living in those countries will increase the interdependence of companies and research organisations. Technologies helping to manage globalised organisations will become more essential. The automation and digitalisation of services to older people will be a key trend of the future as the elderly population in Europe and Asia will rise over the next decades.

'Orange has clinched a contract with the French government to build a web portal through which citizens will be able to access all public services.'

Vincent Etchebarne - Service Platforms Architect ORANGE

PROJECT CELTIC FIDELITY

DURATION 21 months

COST 10 Million Euros

COUNTRIES France, Spain, Norway, Italy, Finland

DESCRIPTION

Getting tired of filling in endless forms on the internet when you just want to make a simple purchase or find some information? Had enough of receiving a barrage of emails from companies after shopping with them online? This project has the answer.

Management of scarce resources

It is estimated that if the growing population in emerging countries adopts the average western lifestyle we will need the equivalent of 2.3 planets' resources by 2030. The standard of living followed by societies in developed countries -with a high demand for education, health, mobility, consumer goods, water and energy- should nonetheless be made accessible to the population in emerging countries, but within the constraints of the available natural resources and without harm to ecosystems. This can be achieved through the development of new technologies allowing a better, more efficient use of energy, but also essential resources such as water.

Climate change and energy Supply

The years between 2001 and 2009 constituted the warmest unbroken period since measurements began in 1850. The growth in energy demand comes with an increase in greenhouse gas emissions that threaten to dramatically alter the environment. At the same time, energy supply will be concentrated in a small number of exporting countries, rising significant concerns about energy supply security for many other countries in the world. The economically sound renewable energies currently under development will represent an increased share of the energy mix, offering both energy auto-sufficiency and low-carbon sources of energy. Simultaneously, carbon capture will enable our economies to continue to exploit safely remaining reserves of fossil fuels.

'we hope to export our know-how in wind energy worldwide and play a role to set up europe as a leader in this technology.'

Stéphane His - VP Renewable Energies TECHNIP

PROJECT EUROGIA+ WINDFARMVESSEL

DURATION 20 months

COST 1 Million Euros

COUNTRIES France, Norway, Spain

DESCRIPTION

The project will help offshore wind energy to take the step from a costly idea relying on public funding to a market driven and competitive energy solution.

'by equipping a car with IQ fuel technology, you would be able to sell the same vehicle in china and in germany.'

Hervé Richard - project manager Continental Automotive

PROJECT EURIPIDES IQ FUEL

DURATION 43 months

COST 8 Million Euros

COUNTRIES France, Finland, Germany

DESCRIPTION

With a Europe-wide publicly-funded effort, automotive engineering giant Continental has revolutionised car engines, together with partners including PSA Peugeot – Citroen and Daimler.

Healthcare and nutrition

The health sector will become one of the most important markets. An emerging trend is making healthcare affordable for a larger population: through the reduction of treatment costs and the generalisation of home treatment where appropriate. Personalised healthcare will be driven by progress in genetic analysis based on the convergence of medicine, pharmacy and biotechnologies. The medical and food sectors will become more intertwined combining nutrition with healthcare. Pharmaceutical companies could offer food products while food manufacturers will move into health-related markets.

The role of EUREKA Clusters in a changing world

As the next chapter will show, EUREKA Clusters answer to the new challenges our economies and societies will face before 2030. In view of these challenges, development of more cooperation is mandatory. Most of European companies cannot afford to invest alone in an R&D effort, especially in the right time frame to deliver technological products to the market before their international competitors. Therefore a major challenge for the future will be to reconcile competition with co-operation in order to answer the emerging economic and social challenges requiring major investments.

EUREKA Cluster projects, funded through public-private partnerships, offer the ideal environment to create confidence and build alliances between large companies, SMEs, universities research organisations and public authorities.

Urbanisation and mobility

In 1950, less than one-third of the world population lived in cities compared to more than half of it today. The management of the complex infrastructure of mega-cities has to cover energy, mobility, waste disposal, water and wastewater treatment, city lighting, safety and security. The quality of transport services has a major impact on people's quality of life and mobility is vital to economic growth. Effective transport systems are key to European companies' ability to compete in the world economy: logistics account for 10 to 15% of the cost of their finished products. New technologies can enable safer personal and public transportation means, while traffic and merchandise transport can be monitored and managed to make our cities less congested and our distribution networks more efficient.

Chapter 5

EUREKA Clusters, an essential and proven instrument for the global competitiveness of European industry in the future

In the light of a rapidly changing research and innovation landscape and changing market conditions, companies have to strengthen their R&D activities – and capacities – more towards innovation, anticipation and collaboration, to maintain and improve competitiveness.

A full 25 years of targeted activities have made the EUREKA Clusters the perfect framework for European companies to extend and fortify their collaboration activities, for more innovation for the market place and the benefit of the society as a whole.

The Inter-Cluster Committee

In 2010, Clusters became increasingly aware of the need for their members to access and use technological domains, which were outside their main area of expertise (for example, water treatment equipment requiring more and more ICT-related technologies). Clusters first agreed to have a regular exchange about evolutions in their respective domains, to support the management of multi-disciplinary inter-Cluster projects, then to share good practices and finally to set up a common representative body with a single spokesperson.

The Inter-Cluster committee and EUREKA as a whole also understood the need to strengthen their relationship. Since 2011, this cooperation has resulted in extended communication between EUREKA Clusters, with exchange of data and information updates in regular joint meetings and agreement on a process to manage inter-Cluster projects. The Committee has constant contacts with the EUREKA Secretariat and the Committee's spokesperson is now invited to EUREKA Executive Group and quarterly network (NPC and HLG) meetings.

EUREKA Clusters have understood the need to develop cooperation in various directions and have therefore identified four priorities and common principles for the coming years:

- To maintain in the Clusters a focus on their respective domain with clear objectives while addressing any market opportunities, and to be more pro-active in identifying new markets, in order to strengthen the European actors' competitiveness;
- To increasingly focus on collaboration between Clusters, in multidisciplinary projects beyond the boundaries of each Cluster domain and promote R&D activities out of the classical route;
- To extend exchange and collaboration with other R&D entities (Eurostars, JTIs, EIT, etc., but also more amongst the Clusters themselves) and public authorities in order to be more efficient;
- To attract the best R&D&I players from Europe and beyond.

According to these main principles, the EUREKA Clusters have defined their respective vision, missions and strategy for the coming years.

'the project's consortium has contributed to mobile communication standards which are now being used all around the world.'

Werner Mohr - Head of Research Alliances NOKIA

PROJECT CELTIC WINNER+

DURATION 26 months

COST 13 Million Euros

COUNTRIES Germany, Denmark, Finland, France, Greece, Italy, Poland, Spain, Sweden, UK

DESCRIPTION

A European consortium has developed capabilities leading to global standards for the next generation of SMARTPHONES. Their breakthroughs will help contribute to new products, employment and business worldwide.

In 2010, the United Nations adopted a resolution recognising the human right to drinking water and sanitation. Water is also a major economic asset, the world market for water supplies and treatment equipment being estimated to 300 billion euros yearly and growing. The present worldwide infrastructure represents a substantial 3.5 million kilometres of drinking water pipes and more than 2.2 million kilometres of waste water networks.

ACQUEAU is the first EUREKA Cluster dedicated to environmental sciences and relevant technologies, which evolve and renew themselves rapidly. In the water sector, innovation and technological breakthroughs target long term investment for water infrastructures. They also need to adapt rapidly to societal changes and economic needs.

VISION

The development of a common vision for water innovation aims at ensuring that the European water sector will be the leading international centre of expertise for providing safe, clean and affordable water services while protecting the environment and managing the water resources for the next generation. ACQUEAU is working to strengthen the competitiveness of the European water sector. It includes driving innovation and technology developments in the larger context of the different European programmes. ACQUEAU is a key Cluster for:

- Shaping standards and creating new markets, services and technologies at the European levels;
- Strengthening the sector by building new networks and new collaborative projects among different partners i.e. industries, SMEs, universities and research organizations;
- Contributing to economic growth through knowledge and innovation but also ensuring the effective implementation and commercialization of the technologies developed.

MISSION

To encourage the development of new technological products and services, ACQUEAU developed a technological road map called the Blue Book, based on the water cycle - water sourcing, treatment and distribution, wastewater collection and treatments.

ACQUEAU has identified five key challenges to boost the competitiveness of the European water sector with a bottom-up approach based on the needs of the industry. They are:

- Low environmental impact of disinfection and oxidation processes;
- Low energy wastewater treatment;
- Membrane technologies;
- Real-time system management;
- Materials for pipes and coating.

STRATEGY

Water is more than ever at the heart of European & international agenda. Set for the period 2013-2020, ACQUEAU's strategic orientation has been defined by the water industry and includes commitments to:

- Bring support to applied R&D and market uptake and overcome the "valley of death";
- Stimulate the collaboration between Europe and other strategic countries such as Canada, Israel and Turkey;
- Cooperate with other networks and organisations such as WssTP, the Water EIP, the Water JPI and ERRIN, to ensure the coordination of activities in the water technology sector.

'the EUREKA
ACQUEAU
Cluster offered
us the opportunity
to develop
an innovative
consortium while
increasing our
chances to get
a grant.'

Cyrille Lemoine -
Research Programme
Manager VEOLIA

PROJECT ACQUEAU SWARM

DURATION 48 months

COST 9 Million Euros

COUNTRIES France, Switzerland, Germany

DESCRIPTION

This ongoing project will build a complete solution for real time monitoring of water resources, thanks to a wireless probe network and a data collection. the cost of the monitoring of water distribution networks will be reduced drastically.



Micro and nanoelectronics

CATRENE, which covers the domain of semiconductor technologies with micro and nanoelectronic solutions, represents European semiconductor organisations including material and equipment suppliers, chip design houses, semiconductor manufacturing companies, and associated research organisations.

Micro and Nanoelectronics are omnipresent in our society and are a major enabler for new products and services especially in the ICT world. Micro and Nanoelectronics are domains with high capital and are brain intensive. They are a driver for all electronic applications and this is supported by a very high level of R&D&I, representing nearly 20% of sales.

Now a mature domain, the semiconductor market has registered a compound annual growth of 5% since the year 2000 with similar growth forecasted in the future.

This domain has been recognized by the European Commission and the National Public Authorities as one of the Key Enabling Technologies for the future of the European economy.

CATRENE offers R&D actors a framework for fruitful cooperation leading to the development of new equipment and material, semiconductor processes, as well as the associated manufacturing capabilities, advanced chips and HW solutions.

With regards to the future, it is obvious that micro and nanoelectronics will continue to play a key role in enabling the development in Europe of new systems and solutions. In this respect, CATRENE has completed a Vision Mission and Strategy (VMS) document, whose objective is to identify the potential opportunities and main domains of development for the European semiconductor industry.

VISION

In terms of vision, CATRENE intends to build a sustainable European position in designing and manufacturing semiconductors systems solutions driven by market opportunities.

Through a global approach, the CATRENE programme will allow for the combination of advanced technologies, semiconductors design solutions (HW and SW) and equipment & manufacturing effectiveness.

This integrated approach will strengthen Europe's capabilities in developing complex semiconductor based systems and will contribute to the creation of high added value employment.

MISSION

Regarding the missions, CATRENE will:

- Focus on new technological and product developments;
- Concentrate on domains/applications/products where Europe is a leader and on new market opportunities involving the complete value chain;
- Expand on higher TRLs (Technology Readiness Levels) including demonstrator and test beds;
- Focus on innovation, IP protection, standardisation, support of equipment and manufacturing science in EUROPE;
- Develop synergies and shared services/support with other EUREKA Clusters and R&D initiatives.

STRATEGY

For the coming years, CATRENE is committed to:

- Continue productive cooperation with other EUREKA Clusters and public authorities, coordinate and differentiate with other programmes addressing similar or related topics and with the new JTI in particular;
- Help European partners in preparing new solutions in order to answer to the societal challenges and to be present on emerging markets;
- Expand cooperation both inside Europe and at the international level;
- Improve its operation and its services related to project execution.



www.catrene.org

The EUREKA Cluster dedicated to telecommunications networks and services

The Internet has become the global hub for information and communication where different actors, whether businesses, communities or individuals, connect with each other, share their contents, and want to be aware of their context. They are connected to social networks and virtual worlds, sharing knowledge within a given community.

They want all those features to be accessible anywhere, anytime and on any device, but they also want to protect their privacy. The exponential increase in the number of connected device and 'things' (including in particular sensors and actuators) which are used for example to monitor our health, improve security, help cities becoming 'smarter', and more generally to improve and facilitate the lives of citizens and the competitiveness of businesses, requires to spend even more effort into looking for innovative telecommunications networks and services related technologies.

VISION

Communication technologies are more and more essential to support a new era where individuals, communities and businesses will see the frontier between the physical and the digital world progressively become more transparent. New challenges are appearing, in which communication technologies have a large role to play, e.g. in environmental awareness, where they could help sectors such as health or transport manage and control the best use of energy.

CELTIC-PLUS positions and will continue to position itself and its ecosystem of R&D and innovation project participants at the heart of this digital era with its new 'Smart Connected World' concept, in line with global challenges as well as with national strategic priorities of the EUREKA member countries. CELTIC-PLUS intends to continue and play an important role in advancing market-oriented R&D in telecommunications and strengthening the European telecommunications industry.

MISSION

CELTIC-PLUS shall allow European industry (large companies, mid-sized companies and SMEs) and academia to continue and join forces in order to solve the technological and societal issues behind technological and market trends that are moving fast. In addition, CELTIC-PLUS shall also continue to work with public authorities in order to make progress towards a fully efficient implementation of projects, with a shorter and more secure label-to-funding process, a better participation from some large EU countries that are still not fully engaged into CELTIC-PLUS projects, and a higher funding, both for the programme as a whole, and also for each project. In addition, CELTIC-PLUS shall continue to actively cooperate with complementary initiatives such as the European Commission's Future Internet Public-Private Partnership and with the relevant DG CONNECT Units in light of the upcoming H2020 programme.

STRATEGY

CELTIC-PLUS' strategy, as developed in the CELTIC-PLUS 'Purple Book', is asking projects to primarily focus on two key aspects, infrastructure/networks & connectivity, and end-to-end services & applications, which we have respectively called 'Get connected' and 'While connected'. A gradual expansion towards a better integration between these two aspects is at the heart of CELTIC-PLUS, to help building up a 'Smart Connected World'.

CELTIC-PLUS' strategy is continuously adapting to the fast changing technological and societal landscape. New operational concepts such as the 'CELTIC-PLUS Future Internet Use Case Factory' and more multidisciplinary projects with the other EUREKA Clusters help address new challenges.

To respond to all these challenges, CELTIC-PLUS recently released an ambitious 'CELTIC-PLUS Strategic Action Plan', worked out with the public authorities, stressing in particular the following issues:

- Continue the bottom-up, industry-driven approach following the main research aspects of the Purple Book, extended by new challenges that will become important;
- Define more flagship projects with a significant budget, which are supported and agreed between several interested countries already at the definition phase and which are supposed to generate a significant impact assuring a strong position of the European industry;
- Intensify the promotion of activities for the new challenges and for attracting new partners working on new required fields.

The Smart Electronic Systems Cluster

Today European industry has the opportunity to acquire strong initial positions by targeting the new markets for heterogeneous electronic product integration, smart sensors and power electronics, enmeshed and implanted systems. This is where the value added by the positioning of European industry and its knowhow are the greatest. Europe must from the start become a major player in these revolutionary new markets.

Building on the success of EURIPIDES, the EURIPIDES² Cluster aims to support cooperative industrial research in Europe in the crucial domain of smart electronic systems integration. EURIPIDES² will focus on research and development close to actual applications and marketable products that could be manufactured in Europe with competitive prices. This involves exploiting the complementarities of all the different players in the electronics scene, such as academia, SMEs, large companies, integrating companies and end-users, as partners in cooperative projects.

The EURIPIDES² ecosystem covers activities that range all the way up the electronic systems integration value chain, from materials, equipment and technologies, through components, modules, up to embedded, mechatronics, enmeshed and implanted systems. In 2012, these activities involve about 1.7 million employees in Europe, out of the 2.5 million employed in all the European electronics industry.

'our project unified a laboratory in process science, a worldwide leader in the manufacturing of precious metals and a printed electronics manufacturer.'

Remi Noguera - CEO CERADROP

PROJECT EURIPIDES CERAMJET

DURATION 41 months

COST 3 Million Euros

COUNTRIES France, Belgium, Germany, Austria

DESCRIPTION

Ceramjet aimed at manufacturing ceramic electronic components based on a breakthrough ink jet printing technology. A new range of printing machines is already on the market.

The prospects of employment evolution in the EURIPIDES² domain in Europe over the coming decade, where 700 000 new jobs can be created in Europe, show the major importance of the action of EURIPIDES², which can help make part of these new job prospects become real, through the power of the European Smart Electronic Systems technology, design and manufacturing.

VISION

Maintain European Leadership in Smart Electronic Systems Integration design development and manufacturing

MISSION

Innovation hub for smart sensors, smart power modules and more generally heterogeneous electronic product integration for all leading industry sectors in Europe

STRATEGY

- Focus on heterogeneous electronic products integration, advanced smart sensors and power electronics;
- Increased participation of SMEs building on EURIPIDES² "savoir faire" and network;
- Involve European industrial leaders in supporting the definition of the innovative electronic hardware platforms;
- Capitalize on its partnership with DG Connect (European Commission) to further cooperate with the EU Horizon 2020, the R&D&I framework and Key Enabling Technology areas (printed electronics, robotics, photonics ...);
- Promote multi-sectorial projects through the EUREKA Cluster co-labeling;
- Priority stress on following-up European innovation for manufacturing in Europe.

EURIPIDES²
European Smart Electronic Systems

www.euripides-eureka.eu

Given the difficulties in reaching legally binding international agreements on greenhouse gas emissions, public policies alone are unlikely to put the world energy system on a more sustainable path: a major technological transformation is needed.

VISION

EUROGIA2020 is the third mandate of EUROGIA Cluster. It is dedicated to promoting and facilitating the development of low carbon energy technologies.

MISSION

EUROGIA2020 focuses on:

- Innovative Solutions that will satisfy the growing energy demand;
- Enablers that reduce the negative impacts of energy consumption;
- New technologies that give access to affordable as well as cleaner and safer energy.

STRATEGY

- Promote transnational energy related projects (primary energies: Biomass, wind, hydro, solar, waves, geothermal, fossil fuels; and their transformation, transport, distribution and efficient end use) and enabling technologies (Carbon Capture and Storage CCS, processes, new materials, etc);
- Involve European Energy technology firms representing the largest possible market segments;
- Involve the research institutes, public and private, specialised in the accompanying disciplines to support leading technology firms in EUROGIA2020: geosciences, information technologies, materials, fluid mechanics, marine sciences, electronics, chemical engineering.

EUROGIA2020 Action Plan:

- Identify key priorities in key EUROGIA2020 supporting countries and organize technology focused brokerage events.
- Promote collaboration with the SET-Plan at three different levels: Joint Calls, sharing project information on SETIS, top up funding from the EC for EUROGIA2020 projects.
- Access to regional funds and tap into expertise of other regions through trans regional collaborative projects.

EUROGIA2020 will liaise closely with all energy relevant ETPs and regional Clusters focusing on energy. As an example, in September 2013 a joint brokerage event with the European Technology Platform on Renewable Heating and Cooling is planned

eurogia²⁰²⁰

www.eurogia.com

Software has a major role to play in mastering all societal and economic challenges as indicated in the High-level vision ITEA-ARTEMIS 2030.

For Europe, an industry strong in ICT-based innovations is a prerequisite for maintaining global competitiveness. ICT-enabled innovation makes an increasingly important contribution to the economic growth of advanced economies.

To maximise the benefits of ICT, it should not only be applied intelligently but should also be fuelled by research and development (R&D) of innovative applications. Research should push the innovative applications and the application fields should pull to get the right research results.

VISION

The period from now to 2030 will be one of permanent change and disruption. In 2030 the world population will reach the number of 8 billion people. Only 23% of this 8 billion will live in Europe and the Americas. Therefore a global view is important, and not only look to Europe and to European initiatives. To see this development positively, this should be seen as '8 billion opportunities'.

MISSION

Seizing the high ground:

The main ambition of ITEA is to contribute to European competitiveness and wellbeing through ICT-based innovation. In a nutshell ITEA stands for innovation, business impact and fast exploitation. In ITEA 3, the ambition will be to seize the high ground to ensure that European industry continues to be at the leading edge worldwide.

STRATEGY

In order to be prepared for the period ahead, full of change and disruptions, four improvements are being implemented for ITEA 3:

- An agile organisation with professional quality management;
- A living roadmap, including a State-of-the-Art database;
- A much shorter time from idea to running project; and
- Continue to build upon the strategic links to other Clusters – such as ARTEMIS, EUREKA Clusters, EIT ICT Labs and national competitiveness Clusters – as a stepping stone towards a 'global web of Clusters'.

The ARTEMIS – ITEA Cooperation Committee (AICC), coordinates and maintains under the authority of the ITEA and ARTEMIS Boards the High-level Vision 2030 and the initiatives towards a Global Web of Clusters.



INFORMATION TECHNOLOGY FOR EUROPEAN ADVANCEMENT

MANUFUTURE INDUSTRY

High Added Value and sustainable manufacturing

Manufacturing is a vital sector, whose role is increasingly seen as fundamental towards European recovery and sustainable growth globally. It is a relevant enabler of the current shift towards a 'Competitive Sustainable Globalisation', addressing grand Socio-Economic and Environmental challenges of our times.

MF IND is setting out to address these challenges by putting the human being back at the core of manufacturing, both as a user of manufactured goods and 'designer' of the entire manufacturing engine:

- By devising new products/processes for new consumers: i.e. increasingly involving consumers in the design of products and related services which better satisfy individual needs; answering an emerging class of consumers in new markets, who want high added-value, customised products and have more cash to spend for them;
- By better (co-)designing the whole life-cycle of both products AND processes, to reduce their footprint, improving use of traditional materials, introducing new ones, revising processes to optimise use of energy and material resources, as well as valorising know-how and skills;
- By focusing at increasing the quality of life of users, by devising new approaches and processes to produce tailor-made products suited to individual needs: e.g. using digital tools to collect product preferences or monitoring special health conditions and drug delivery, or using energy- and resource-harvesting technologies for food of higher quality, safety and reduced impact.

'the low-bureaucracy and effective support sped up the start of project activities, responding to our industrial innovation needs'

Giuseppe Lucisano - Innovation Team, SCM Group

PROJECT MF. IND. 3M SUSTAINABLE PLANT

DURATION 46 months

COST 19 Million Euros

COUNTRIES Italy, Republic of San Marino, Greece

DESCRIPTION

This project is driving the study and piloting the implementation of next-generation, "Open Factory" integrated production systems for full-lifecycle product-services in an environmentally safe context.

VISION

A 'Sustainable (Re-)Industrialisation' of EUREKA countries, with better balance of social, economic and environmental instances.

MISSION

Enabling and sustaining manufacturing businesses in the development of innovative, sustainable High-Added Value products and processes.

STRATEGY

- Follow the 'Manufuture vision', addressing the simultaneous innovation of products and services, processes and business models;
- Engage in the 'human-centered' environment (Personalised consumer products, health and wellness, food), while developing innovative high-tech components and High Added-Value equipment and systems;
- Focus on chosen enabling technologies: sustainable production technologies and processes, energy and resource harvesting, equipment and systems with closed-loop lifecycles (reusable and reconfigurable), ICT and digital tools for design and sustainable manufacturing, smart and learning industrial equipment and products, green and organic electronics and optoelectronics;
- Expand activities to new product and production areas – such as food-related industries – and to membership beyond Europe – to countries such as Canada, South Korea or South Africa;
- Stronger internal coordination: with other Clusters in complementary technological areas in inter-Cluster initiatives; with EUREKA Umbrellas, such as ProFactory+;
- Reinforced external cooperations: within Horizon 2020, in particular with 'Factory of the Future PPP'; participation to European Technology Platforms such as Manufuture; interaction with national and regional initiatives and Clusters innovating in manufacturing.



www.manufuture-industry.org

CONCLUSION

EUREKA Clusters are a unique instrument for business-oriented innovation in coordination with national innovation policies. EUREKA Clusters support the creation of international cooperation projects by consortia of large companies, SMEs and research organisations, and other public and private organisations. EUREKA Cluster projects are based on concrete business opportunities as identified by industry and on the national strategic priorities determined by the EUREKA member countries public authorities.

EUREKA Clusters have produced strong results, which in many cases have substantially strengthened the business position of participating companies and led to benefits for society in Europe and beyond.

And EUREKA is always open to endorse new and complementary Cluster initiatives that industry and member countries have an interest to establish. Industry needs EUREKA Clusters and public authorities in many countries want EUREKA Clusters. All Clusters are clearly positioned and ready for the future. Their flexibility makes the EUREKA Clusters an essential instrument in today's research, development and innovation landscape.

'if we can get involved in a Cluster and use the experience to grow, so can other companies. It is very much a trail blazer for us.'

Brian Hanly - Chief Executive Officer Exoflware

PROJECT ITEA AGILE

DURATION 33 months

COST 21 Million Euros

COUNTRIES Belgium, Bulgaria, Finland, France, Ireland, Italy, Netherlands, Slovenia, Spain

DESCRIPTION

A project which gave way to a radical change to the way software is developed and is already speeding embedded software projects in a range of key European industries, from avionics to telecommunications.

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