



SEMICONDUCTOR EUROPE NEWSLETTER

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Key Enabling Technologies (KETs): Responding to societal challenges & creating new markets for Europe

Revised economic growth patterns, structural problems such as an ageing population, exploding healthcare and energy costs, transportation bottlenecks and the need to increase productivity for global competitiveness all require innovative and sustainable solutions. These put the contributions of our industry into the spotlight. Micro/nanoelectronic technologies underpin the entire market for today's and tomorrow's electronic products and services, enabling innovative solutions and applications that serve the needs of end customers in all aspects of their daily lives.

The European Commission recognized this with its communication *Developing a common strategy for key*

enabling technologies in the EU. It stressed the need for the EU "...to maintain a strong and highly competitive industrial base as a precondition for ensuring the welfare, prosperity and security of its citizens. It requires rapid and continuous innovation towards higher value and knowledge-intensive goods and services". The commission also underscored the strategic importance of these technologies by appointing the high level group (HLG) to propose measures for the deployment of KETs.

ESIA has helped to build the micro/nanoelectronic background for this initiative. Based on its 2008 competitiveness report *Mastering Innovation – Shaping the Future*, it focused the policy makers' attention on the unique role micro/nanoelectronics play and called for initiatives in four supporting pillars: R&D funding, creating market opportunities, maintaining industrial capabilities and developing skills, all under the umbrella of an industrial innovation policy for Europe. Addressing societal challenges represents a major opportunity for the semiconductor industry to support both existing markets and the creation of new ones. In Europe, it has already demonstrated that a strong and highly innovative industry contributes to the competitiveness of the overall economy.

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Kick-off meeting of the KETs High Level Group in July 2010 with Commission Vice-Presidents Antonio Tajani, Neelie Kroes, Commissioner Máire Geoghegan-Quinn and the representatives from the six KETs

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Smart grids & semiconductors: Connecting the dots

Would you allow a pilot to fly an airplane blind? Surely not, yet this is the standard situation that has faced customers and suppliers of electricity for many years: the complete lack of transparent information to make informed choices in their homes. Consumers typically know very little about their own consumption patterns, while suppliers remain in the 'clouds' about the status of electricity grids. This lack of knowl-

edge about electricity consumption is due to the fact that information doesn't become available until after electricity has been consumed. However, thankfully the clouds are beginning to clear - through the application of smart grids and smart meter technology, consumption patterns in a near to real time can be identified.

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Message from the President

The semiconductor market has now returned to pre-crisis levels also in Europe, currently showing strong growth in sales and units. This shows the strong dynamics and regained strength of this industry. Yet this is not the time for complacency.

At ESIA, we have consistently highlighted Europe's structural challenges from our perspective and have called for an industrial innovation policy in and for Europe. The political response has been the *key enabling technologies* initiative and the setting-up of the KETs High Level Group. An important milestone in this process was the Micro/nanoelectronics Open Day in October 2010. We will continue to drive the process to achieve concrete deliverables and recommendations, which can be applied to improve the level playing field for Europe.

Supporting the KETs initiative, therefore, is a central activity for ESIA, yet by no

means the only one. The scope of issues ESIA is involved in continues to grow and bring results for our industry, in line with our mission. Whether trade issues, environment safety and health (ESH), anti-counterfeiting, R&D policy, our credentials for smart grids or ESIA's activities at the World Semiconductor Council (WSC), we have seen a highly committed membership willing to take on challenges and leadership and speak with one strong semiconductor voice. These developments are not going unnoticed. I am pleased to see new key members join ESIA from semiconductor research, fabless, IP provider and assembly and test services. We can only encourage and facilitate this further, for example by broadening our membership rules and catering for a larger and more active membership.

This edition of *Semiconductor Europe* gives you a flavour of where we stand on some of



the issues which have a direct impact on the European semiconductor industry. I look forward to working with all of you to address the semiconductor challenges ahead.

Peter Bauer
CEO, Infineon Technologies
President EECA-ESIA

The semiconductor market in 2009

- Total worldwide market value 2009: \$ 226bn (€ 162bn). Total European market value 2009: \$ 30bn (€ 21bn)
- Percentage of worldwide market in 2009: Europe 13% / Americas 17% / Japan 17% / Asia Pacific 52%

The different semiconductor market mix in Europe, 2009

SOURCE WSTS



EUROPE		WORLD
1%	GOVERNMENT and military purchases	1%
8.5%	CONSUMER entertainment, radio, TV, VCR, personal or home appliance, camera, games, etc.	19%
20%	AUTOMOTIVE powertrain, safety management, body and convenience, engine controls, entertainment	7%
33%	COMPUTER & OFFICE mainframe, peripheral office equipment and personal computers	42%
16.5%	INDUSTRIAL & INSTRUMENT lab, test, control and measurement	9%
21%	COMMUNICATIONS wired and wireless, mobile, RF connectivity solution (Bluetooth, GPRS...), telecommunications, traditional telecom equipment, home networking equipment	22%

The different semiconductor market mix in the world, 2009

SOURCE WSTS



Raid on chip trader in France reinforces need to fight counterfeiting

In May 2010 a raid on a semiconductor importer and retailer by French Customs and an ESIA member company proved that countermeasures lead to results. Gal Messenger, ESIA anti-counterfeiting task force (ACTF) chair at the time of the raid explains: *“More than half a million proven counterfeit chips marked as one ESIA company were seized. French Customs also found large supplies of further chips marked with logos and part numbers from several other major semiconductor companies. Unfortunately, these could not be seized as no prior complaint had been received and no court order had been issued allowing their seizure.”*

Here lies one of the key obstacles in Europe: more companies need to engage to ensure cooperation with EU customs at EU and national level and together overcome the often logistical and legal difficulties in fighting semiconductor counterfeiting in Europe. This is where ESIA's ACTF is working and where it will place a strong emphasis on the future.

It is no secret that the proliferation of counterfeit chips seriously increases the health and safety risk for the end consumer, should the wide range of products which contain semiconductors malfunction. Beyond this, the damage is also an economic one for semiconductor rights-owners and distribution chains with effects on the wider economy. Estimates of the loss to the global semiconductor market due to counterfeiting range between 2-4% (i.e. between some €3.2 billion and €6.5 billion), indiscriminately affecting all brands. Without further effective and global countermeasures we are fuelling a black market in which lack of awareness, the need to cover supply and the search for a quick bargain are being exploited through criminal activity, illegal and unaccountable trading practices and difficult IPR enforcement measures. All at a very high risk. However, ESIA's ACTF is working to improve the situation.

In 2007/2008 members of ESIA's ACTF provided training for customs' officials in



A counterfeit chip seized in France in 2010

key European entry hubs to secure a first large-scale coordinated border operation targeting semiconductors. In September 2009, we helped ensure the success of the first ever semiconductor anti-counterfeiting workshop for customs' officials, bringing together industry and customs' experts from China, the EU, Japan, Korea, Taiwan and the US.

The chip counterfeiting market is booming with the upturn of the chip market, with industry reporting up to a doubling of counterfeit chips since the end of 2009, based on numbers of seizures and customer complaints. Therefore, in 2010 and beyond, the case to continue with these initiatives is stronger than ever. ■

ESIA & the European Chemicals Agency publish REACH exposure scenario examples

The European Chemicals Agency (ECHA) and ESIA have completed a joint project to develop three practical examples of exposure scenarios under the REACH chemicals regulation.

The aim of this project was to complete practical examples of exposure scenarios for the industrial use of three substances used in the semiconductor manufacturing process and to demonstrate the control of risks for human health and the environment based on the corresponding release and exposure estimation and risk characterisation. Based on three substance examples and their uses, the exposure scenario describes the conditions of safe use in clean rooms. The examples demonstrated that

the risk of hazardous substances can be adequately controlled. They are the first illustration of what the exposure scenarios, which are part of the chemical safety reports, of suppliers of chemical substances sold to the semiconductor industry could look like.

Beatrix Pook of Texas Instruments worked on the project and believes it was a useful collaborative exercise for the European semiconductor industry, our supply chain and ECHA. *“This project successfully outlines the risk management measures and practices that are commonly used across the industry and demonstrates the fact that the risk is managed and controlled in our processes”* said Beatrix.



This project, which was completed over ten months, involved ECHA officials, ESIA member company representatives, ISMI (International Sematech Manufacturing Initiative) and various chemical material suppliers to the semiconductor industry. The exposure scenario document is referenced under the guidance document section of the ECHA website and on the [ESIA website](#). ■

Smart grids & semiconductors: Connecting the dots *continuation*

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The movement from traditional passive electricity networks into smart grids marks a fundamental shift in how the world supplies and manages its electrical energy resources. Add into the mix the increasing share of renewable energies, changes in consumption patterns, a huge increase in the demand for energy in the next 50 years and the challenges to construct new power lines; then it becomes clear that more intelligent grid management or a 'smart grid' has to become a fundamental requirement that Europe and the world needs to capitalise upon.

The first step in making an intelligent, smart grid system bring real benefits and choice to the consumer is typically through the installation of smart electricity meters. Smart meters function in a two way flow unlike the traditional one way direction flow, allowing a consumer to manage energy more efficiently and to make informed choices about how much energy to use. Sweden, which made smart metering obligatory in 2003, had around 6 million installed by July 2009, which allowed consumers to better control and adapt their consumption patterns and to receive a more accurate system of monthly billing. The potential for energy efficient

revolution is real. A Capgemini study* in 15 EU countries showed that **if smart meters were installed on a voluntary basis they would save some 200 terawatt hours per month by 2020 – the residential consumption of Spain and Germany – and approximately 100m tons of CO₂ emissions.**

Semiconductors & Smart Grids - Enabling the evolution

Semiconductors will enable society to use alternative energy sources more effectively, distribute them more efficiently and consume them in the most efficient and user friendly way - they are a key enabling part of the smart grid programmes that many countries in Europe are launching. The intelligent grid transformation process signals the digitisation of the energy distribution networks. Many semiconductor products will play key roles in the current evolution of smart grid technology, such as power management, wireless, microcontrollers, digital signal, multimedia and embedded processors and sensors.

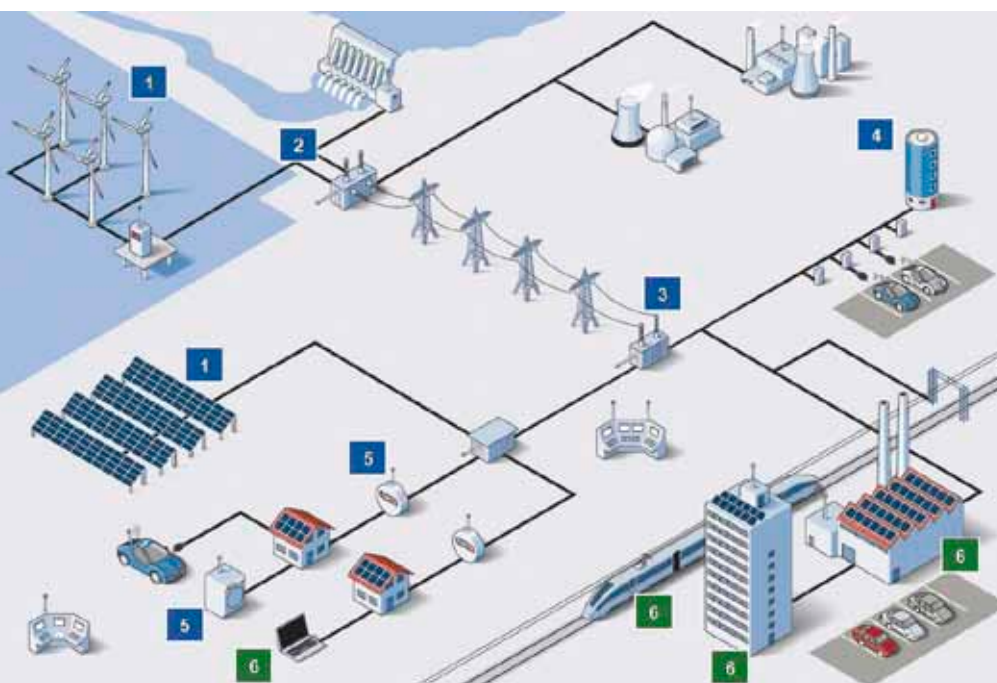
Despite the positive approach by many authorities and industry stakeholders, challenges remain for the successful deployment of smart grids. Adequate pricing,

ESIA smart grid task force activities

ESIA has a smart grid task force and is a member of the EU's task force on smart grids which was set up to advise the European Commission on the coordination and EU wide implementation of smart grids under the provision of the third energy package. ESIA's involvement on the steering group of the task force is currently led by Domenico Arrigo of STMicroelectronics and Thomas Hillman of Texas Instruments. In the first phase of the work just completed by the EU task force the focus has been on outlining the functionalities of smart grids and smart meters, data safety/data protection and the roles of various stakeholders in the overall operation of a functioning smart grid system. "We see our role to advise the EU authorities on the potential that semiconductor products bring to the realisation of the smart grid and to underline the necessity of data protection, open infrastructure systems and interoperability among smart meters to achieve a successful implementation" says Domenico.

an open architecture system allowing for open infrastructures for players beyond the utility industry and the role of standardised communication protocols all remain critical conditional elements for the successful realisation of smart grids. **Without effective smart meter technology, the benefits of a smart grid system, in terms of a more effective distribution and transmission network providing tangible benefits to consumers, will not be realised.** ■

* Demand Response: a decisive breakthrough for Europe How Europe could save Gigawatts, Billions of Euros and Millions of tons of CO₂. Capgemini study 2008.



A functioning smart grid: from renewable energy sources to efficient household consumption
Courtesy of Infineon

- 1 Integration of renewable energy
- 2 Advanced transmission
- 3 Grid monitoring and control
- 4 Energy storage and EV-charging
- 5 Smart metering and appliances
- 6 Efficient consumption

The road ahead for electric cars

Will the 21st Century belong to the electric car? Yes. However, it remains to be seen how long it will take for the electric car to capture a larger market share than the combustion engine. Whatever the timespan, semiconductor technology is going to play a key role in this development. **While the electronic content of today's car already reaches up to 20%, that percentage is estimated to reach some 35% in the electric car of the future.**

In the drive to reduce carbon emissions on the road, hybrid and micro-hybrid vehicles, and non-electric vehicles, still dominate the market. In Europe, however, a target of 95g/km of CO₂ emissions has been set for 2020, against the current 120g/km. Since road transportation currently accounts for 21% of fossil fuel consumption, and 60% of all oil, a fully electric car would represent a significant reduction, assuming the energy comes from renewable sources.

The electric car is on the move and R&D in Europe is increasing. At EU level, the E3CAR (Energy Efficient Electric Car) project, for instance, connects 33 participants from 12 countries and seeks to extend the travel range of electric vehicles by up to 35%.

Nevertheless, the widespread adoption of fully electric vehicles is still hampered by the minor driving range, the high expense of portable lithium-ion batteries and the lack of a standardised and ubiquitous charging infrastructure. In order to fight these weaknesses, the European Parliament adopted a non-legislative resolution in May 2010 to promote a European and global standard for an interface between vehicles and recharging infrastructure.

Electric vehicles represent an essential development for the future of mobility in



Europe. In fact, the EU is home to 15 international car manufacturers which produce around 20 million vehicles a year. It is the world leader in production of conventional cars, but only number 3 when it comes to electric vehicles. **Europe can rely on its automotive micro/nanoelectronics sector to strengthen its competitiveness.** Already with three players in the global top five, European automotive semiconductor suppliers represent more than 30% of the world market.

The full electric vehicle will create an estimated worldwide market in the multibillion euro range. For 2015, it could be around €50bn, in 2020 around €100bn*. **Micro/nanoelectronics based solutions will be needed to overcome the barriers and allow the electric car to rule this century.** ■

* Vision Mission & Strategy for European Micro- and Nano-electronics, CATRENE/ AENEAS, November 2010.

KETs responding to societal challenges *continuation*



KETs Open Day on Micro/nanoelectronics hosted by the EU Commission and the KETs Micro/nanoelectronics Sherpa Group on October 18th, 2010. Panel discussion with E. Sangiorgi (Uni. Bologna), L. Malier (CEA-LETI), T. Brown (ARM), G. Lalis (EC), E. Villa (ESIA), O. Bellezza (ST), L. Van den hove (IMEC), O. Vatel (Global Foundries) & J. O'Hara (INTEL)

The European semiconductor industry leads globally in major segments such as automotive electronics, industrial and medical equipment, identification, wireless communication and consumer electronics. It has all the ingredients to continue leveraging this experience in these and in further markets. How can it take advantage of such achievements? As the need for better health systems, cleaner and safer cars, improved telecommunications and security increases – or whether the task is fighting climate change, smarter energy management, and demographic changes - new approaches are required for each of the re-

spective value chains. This covers the spectrum from mobilizing key technologies upstream to prototyping solutions; from designing intelligent electronic systems to end-use production; from technology enabled innovations to demand creation. ESIA called this 'market pull'. While the industry gets ready to bring its solutions to the market and seeks to strengthen its value chain in Europe, the urgency and the opportunity call for proactive measures.

This requires:

- ▶ setting priorities for innovation driven solutions that call for embedded

intelligence enabled by micro/nanotechnologies,

- ▶ aligning the stimuli for accelerating emerging markets with consumer expectations, along with facilitating a cultural change in consumer's receptiveness,
- ▶ creating the regulatory conditions (e.g. targets, standards) for fast and interoperable market adoption,
- ▶ strengthening the technology push and the European ecosystem,
- ▶ establishing a global level playing field.

KETs focus on solutions that will make people's lives smarter, greener and simpler. Improving Europe's economic prosperity and reinforcing the ability of its industries to drive innovation will play an essential role in achieving the EU's objective to remain at the forefront of global competition and to effectively respond to today's societal challenges. ■

François Escher is Director of Public Affairs Europe for Marvell Semiconductor and writes in his capacity as ESIA's Comp. TF Co-Chair.

New Members



The Architecture for the Digital World

ARM Holdings is the world's leading semiconductor intellectual property (IP) supplier and as such is at the heart of the development of digital electronic products. Headquartered in Cambridge, UK, it employs over 1700 people worldwide, around half in Europe. ARM has offices around the world, including design centres in France, India, Sweden, and the US.

The ARM business model involves the designing and licensing of intellectual property rather than the manufacturing and selling of semiconductor chips. We licence this IP to a network of partners, which includes the world's leading semiconductor and systems companies. These partners utilize ARM IP designs to create and manufacture system-on-chip designs, paying ARM a license fee for the original IP and a royalty on every chip or wafer produced. Though

primarily known for our family of ARM CPU IPs, we also provide a range of tools, physical and systems IPs; to enable the creation of architecturally innovative, high performance, low power system-on-chips; and facilitate the development of imaginative products based on them.

With total shipment of more than 18bn CPUs (4bn in 2009), our partners have made ARM the architecture of choice for the large majority of smart electronic systems being designed today.

As a key provider of semiconductor IP into the smart electronic systems of today and tomorrow, we are closely bound to the roadmaps of the semiconductor industry. ESIA provides a forum where this European community can network and through which it can find a representative voice vis-à-vis European and national government bodies for all of our best interests. ■

Ian Phillips is the Principle Staff Eng. of ARM Ltd, UK www.arm.com



A Next Generation Semiconductor Company

Founded in 1995, Marvell Technology Group Ltd. has operations worldwide and approximately 5000 employees. Marvell's U.S. operating subsidiary is based in Santa Clara, California. It has international design centres located in the U.S., Europe, Israel, Singapore and China. Marvell's design centres in Europe are established in Switzerland, Italy, Germany, the Netherlands, and most recently in Spain. As one of the world's largest fabless semiconductor companies, Marvell ships over one billion chips a year. The company's expertise in microprocessor architecture and digital signal processing drives multiple platforms including high volume storage solutions, mobile and wireless, networking, consumer and green products. World class engineering and mixed-signal design expertise helps Marvell deliver critical building blocks to its customers, giving

them the competitive edge to succeed in today's dynamic market.

Marvell is passionate and committed to inspiring and empowering people around the world with innovation and technology. From the creation of energy efficient products for customers, to the choices made in day-to-day operations, the company believes it can make great strides to solve and promote solutions for some of the world's most fundamental and pressing issues such as education, healthcare, and environmental concerns.

ESIA is helping to shape public policy on issues critical to the semiconductor industry, including protecting the environment. As a new member in ESIA, Marvell is looking forward to pursuing an open dialogue and to advocating the industry's role as a key enabling technology provider to Europe's economy and society. ■

François Escher is Director of Public Affairs Europe for Marvell Semiconductor www.marvell.com



A new Semiconductor player in Europe

NANIUM is dedicated to providing development, manufacturing, testing and engineering services in the semiconductor business, operating namely in WLP/RDL and in traditional substrate and leadframe based packages. Our experienced and highly competent team is prepared to meet tomorrow's challenges and to provide services beyond our customers' expectations. The company was formally established in February 2010, under the ownership of the two largest privately owned Portuguese banks and the Portuguese state. Having started in 1996 as Siemens Semiconductors, the site followed the spin-off of the group into Infineon Technologies (1999) and more recently into Qimonda (2006). Therefore, we rely on a 14 years' long experience in the demanding semiconductor market, having substantial engineering knowledge and experience in cutting-edge technology: we were involved in the development of 300mm wafer technology in volume capacity and we were also pioneers in the processing of RDL in 300mm wafers. NANIUM is now focusing on four main areas:

- ▶ 300mm Wafer Level Packaging and RDL services;
- ▶ High volume production on leadframe and laminate based packages capitalizing on our existing equipment base and know-how;
- ▶ Providing fast prototyping / small series line to support our customer needs (for example SiP and MCP);
- ▶ Providing package and test development and other semiconductor engineering services.

As members of ESIA we intend to partner with other semiconductor companies and with customers to provide high quality and reliability services, based in Europe, assuring fast turnaround, easy communication and a high degree of intellectual protection. ■

Armando Tavares is President of the Executive Board of Nanium www.nanium.com

EECA-ESIA Members

Company Members



National Associations



Research Institutes



EECA ESIA

European Semiconductor Industry Association

The mission of the European Semiconductor Industry Association (ESIA) is to represent, promote and defend the vital interests of the European-based semiconductor industry and ensure its competitiveness in the global market. The semiconductor industry provides the key enabling technologies at the forefront of the development of the information society. This sector supports around 110,000 jobs directly and up to 500,000 induced jobs in Europe, operating in a world-wide market valued over € 162bn (\$ 226bn) in 2009. ■

EECA EPCIA

European Passive Components Industry Association

The second autonomous industry association under the EECA umbrella is the European Passive Components Association (EPCIA) which works to represent and promote the common interests of the Passive Components Manufacturers active in Europe to ensure an open and transparent market for Passive Components in Europe as part of the global market place. ■



ESIA and EPCIA new offices since March 2010 in Brussels

EECA ESIA

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