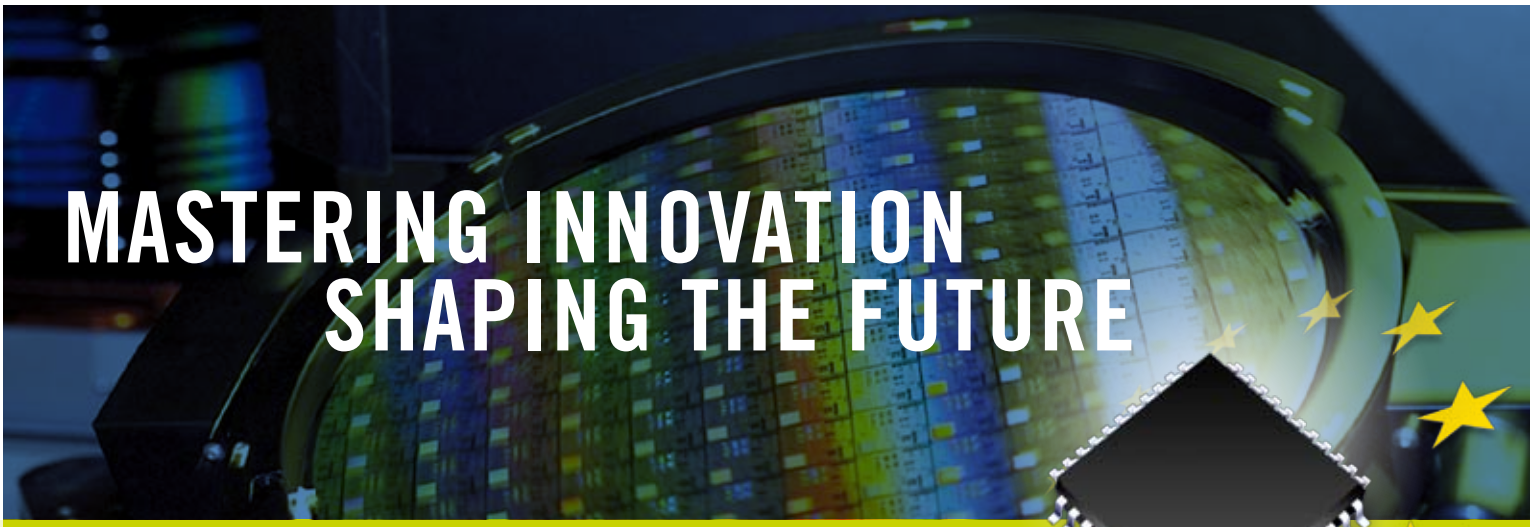

MASTERING INNOVATION SHAPING THE FUTURE

ESIA 2008 Competitiveness Report

2008

EECA ESIA

European Semiconductor Industry Association

EXECUTIVE SUMMARY

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Semiconductors are crucial to Europe's competitiveness. They enable 90 percent of the key technologies and innovations required for advancing a sustainable information and communication economy and directly contribute to generating approximately 10 percent of both European and worldwide GDP. Therefore, a vital semiconductor industry is essential if Europe is to remain one of the world's leading knowledge-based economies and realise the European Union's ambition of putting the Information Society at the heart of its strategy for the 21st century.

In the late 80's and early 90's of the last century, the semiconductor industry in Europe went through a major recovery. During this phase, many local and national champions consolidated. While this was a painful adaptation, the European semiconductor industry emerged stronger than before, generating a robust European presence in the global semiconductor market by the end of the 20th century.

This leadership position was built in a favourable political and economic environment - that also attracted significant foreign investments - and depended on continuous R&D efforts, which continue to be among the highest of all industries. Such efforts are required for engineering, designing and manufacturing products for leading electronic equipment manufacturers in application areas such as wireless communications, automotive, identification, power management and industrial equipment. Even today, these application areas continue to be areas of European strength.

However, the semiconductor industry continues to change. Following the semiconductor boom and bust cycle during the years 2000 and 2001, the map of the global semiconductor landscape has been redrawn: the roles of the various economic regions of the world have been redistributed as new players have emerged and competitive pressures continue to increase. At the same time, the complexity of semiconductor products is increasing dramatically while the investments required to sustain an up-to-date manufacturing base explode. In this global environment, the semiconductor industry in Europe needs to stay ahead of its competition, even though – according to our analysis - the attractiveness of Europe has deteriorated from what it was in 2005.

The key question, therefore, is how to retain and restore competitiveness in Europe in light of the need to address the opportunities emerging from the changes in the industry described above. Europe must reassess existing paradigms and reconsider its priorities in order to take advantage of these industry transformations.

In answer to this question, twelve major trends concerning the focus areas of *'R&D'*, *'Applications'* and *'Production'* are identified in this report. These trends will determine what the semiconductor industry in Europe will look like in the future. The assessment of these trends shows whether they are working for or against European interests. It also indicates the ways Europe can turn the opportunities suggested by these developments into a sustainable competitive advantage for the region and for its semiconductor industry.

According to ESIA, Europe must react to these shifts in the industry and benefit from the opportunities they offer by mastering innovation while taking measures to shape its own future. *'Mastering innovation'* reflects the need for Europe to stimulate a European-led market pull for new application areas and strongly to support investments in micro-/nano electronics R&D to build a European leadership position in a targeted way. *'Shaping the future'* reflects the need for Europe to create the environment needed for these investments to bear fruit so that they can drive overall European prosperity. Here a broad set of measures is required in order to create an appropriate business and investment climate, both for R&D and for sustaining European-based manufacturing capabilities.

ESIA is convinced that leadership in the evolving information society can only be achieved and sustained if Europe retains a vital semiconductor industry. Access to and control over micro- and nanoelectronics remains a precondition for any advanced economy. Therefore, ESIA calls on all relevant stakeholders and decision makers – including EU authorities, EU Member States, universities and research institutes - for concerted action in implementing the measures described in this report and to assure that Europe 'masters innovation' and 'shapes its own future' with a strong semiconductor capability.

Mastering Innovation	Shaping the Future
Stimulating a Europe-led "market pull" for new applications, paving the way toward emerging markets.	Adopt a number of specific regulatory and legislative flanking measures in support of the semiconductor industry.
Establish micro-/nanoelectronics as one of the overriding European R&D investment priorities for EU framework programmes and public-private partnerships.	Leverage the public R&D funding potential that exists in Europe.
	Encourage the role of education as the foundation of intellectual innovation capital and a solid science base.
	Encourage the maintenance and renewal of the European-based manufacturing capability.

Mastering Innovation	
Stimulating a Europe-led "market pull" for new applications paving the way toward emerging markets	Focusing industry-wide innovation incentives on semiconductor systems know-how for new applications.
	Leveraging all the European semiconductor industry's strengths to maintain industries' electronics innovation leadership in the global market.
	Launching cross-industry, cross-border initiatives (clusters, public-private partnerships, etc.) stressing the contributions of semiconductors in specific technology areas.
	Orchestrating a Euro-microelectronics invention awareness programme and encouraging the end-use industry base, from large-scale companies to SMEs.
	Setting objectives for reaching standard agreements for new applications quickly and efficiently in critical development areas demanding high technical performance and quality levels.
Establish micro-/nanoelectronics as one of the overriding European R&D investment priorities for EU framework programmes and public-private partnerships	Seeking a broad alignment of all stakeholders, i.e. the EU Commission collectively represented by DG Enterprise, Information Society, Research, and Competition, EU Member States, companies, universities and research institutions, with the proposed programmes and agendas.
	Promoting and leading international cooperation on issues that are shared with the European industry.
	Fostering the necessary collaborative conditions by creating incentives for all possible forms of clusters, public-private partnerships and ecosystems.
	Applying an improved and Europe-wide generalised / harmonised tax credit scheme for R&D; if necessary by establishing topical specifications related to micro-/nanoelectronics in order to apply it on a case by case basis.
	Making micro- and nanoelectronics a priority educational objective and development theme, ranging from awareness in the primary-to-high school education followed by developing multi-disciplinary curricula in academic training.

Shaping the Future	
Adopt a number of specific regulatory and legislative flanking measures in support of the semiconductor industry	Supporting policy actions at both European and international levels aimed at limiting disadvantageous currency distortions, e.g. the EURO vs. the USD.
	Stimulating the development of regulatory frameworks for labour policies that anticipate and manage change better, e.g. along the lines of the recommendations in the EU green paper.
	Removing possible legislative roadblocks to the introduction of new technologies and systems, in particular in the EHS arena.
	Working in close collaboration with the industry in order to anticipate legislative initiatives and measures in sensitive application areas (e.g. energy, ecology, mobility, health) that will be of significant importance, in particular with regard to the development of nanotechnologies.
Leverage the public R&D funding potential that exists in Europe	Restoring in targeted, EU-wide priority R&D programmes increased public funding levels in alignment with the Lisbon agenda.
	Making available all possible incentive schemes, from R&D tax credits to loans and grants as well as from EU structural funds to national and local measures.
	Encouraging the creation and expansion of new firms in high-technology sectors in order to allow Europe to achieve its R&D potential, calling on EU financial markets and venture capital investment capabilities.
Encourage the role played by education as the foundation of intellectual innovation capital and a solid science base	Launching programmes and curricula at all levels able to raise innovation awareness dramatically and to attract both new students and teachers to all disciplines in the nano-/ microelectronic sciences.
	Leveraging the 'institutional' capabilities academia (universities and research institutes) and regional and local government bodies provide to extend and exploit their research infrastructures such as science parks, incubators, venture partnering, etc.
	Opening much more jointly-coordinated and regulated industry training or PhD specialisation opportunities with established R&D institutions.
	Facilitating the mobility of highly-skilled human resources in science and technology (S&T) disciplines allowing for a more targeted cross-border intake of both students and a young R&D labour force.
Encourage the maintenance and renewal of European-based manufacturing capability	Devising a set of framework policies for existing sites that supports the development of manufacturing capabilities for a large range of innovative products and technologies.
	Supporting initiatives that encourage new EU and national-based development programmes aimed at enhancing innovation and manufacturing capabilities in specific application segments.
	Setting adequate priorities to encourage, at EU and national levels, the creation of economic value by diversifying the capabilities of both the device manufacturers and equipment & material suppliers.
	Encouraging the development in Europe of new tools, methods, equipment or materials needed both for 'more Moore' and 'more than Moore' technologies.

EECA ESIA

European Semiconductor Industry Association

'Diamant' Building
Boulevard A. Reyers 80
1030 Bruxelles, Belgium
Tel: +32 2 706 87 06
Fax: +32 2 706 86 05
secretariat.gen@eeca.be
www.eeca.eu