



EECA ESIA
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European Semiconductor Industry Association

Brussels, September 26, 2005

To:

Neelie Kroes
Member of the European Commission
European Commission
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1049 Brussels (Fax: 02/296 07 44)

Cc:

Carlos Teneiro
Member of Cabinet Commissioner Kroes
BERL 10/262 (Fax: 02/296 04 09)

DG Competition
State Aid Register
SPA 3, office 6/5
1049 Brussels (stateaidgreffe@cec.eu.int)

State Aid Action Plan and the 2005 Competitiveness Report of the European semiconductor industry.

Dear Commissioner Kroes,

The European Semiconductor Industry Association¹ welcomes both the initiative to reform state aid in Europe and the opportunity to be able to comment on the State Aid Action Plan. Indeed, it believes that this issue is too important for the competitiveness of our industry in Europe to simply submit as a formal contribution on the future of state aid reform in Europe. For this reason, we are combining our submission with a request for a meeting with you to discuss this initiative in the context of maintaining and enhancing the competitiveness of the semiconductor industry in Europe; this being the underlining focus of our just published *2005 Competitiveness Report*.

We feel that a meeting should take place at the earliest possible, at a time of your convenience. As ESIA's President, both I and my CEO colleagues believe an exchange at this level would be highly fruitful.

The competitiveness of the European semiconductor industry currently stands at a crossroads. As in every semiconductor producing region of the world, the achievements of this industry would not have been possible without the entrepreneurial efforts of its innovative, competitive and global industry,

¹ The European Semiconductor Industry Association (ESIA), part of the European Electronic manufacturer's Association (EECA), represents the European-based manufacturers of semiconductor devices. The semiconductor industry provides the key enabling technologies at the forefront of the development of the digital economy. The sector supports well over 86 000 direct jobs in a market valued at around €31.7 bn in 2004.

Industry Association of :

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together with the support from governments and authorities, be it through measures ensuring a level playing field for a free trading environment, by providing adequate incentives to stimulate and attract investments or by focusing R&D funding on high-tech products. The possibilities offered through state aid are therefore a vital determining factor in the overall competitiveness equation we outline in our Report.

The direction of state aid reform and the necessity to at least match developments in other regions of the world have prompted us to a general call for action in Europe to move towards a more future-orientated WTO-compatible sectoral approach, which takes into account the characteristics of the industry in order to achieve a level playing field for European industry to compete on the world market, and for Europe to attract further outside investment. We see Europe is lagging behind other semiconductor regions, which have clearly tilted the playing field in their favour.

We have drawn these conclusions from our combined world wide experiences and from work on our 2005 *Competitiveness Report*. It is in this context that we would like to discuss the conclusions of the Report with you and look for possibilities to fill what we increasingly see as a dangerous void of engagement in European support for the high-tech semiconductor industry. We see the use of Art. 87, 3 as one such avenue to explore, as - for example - the semiconductor industry's enabling function within the European economy, its constant capacity/need for innovation and growth and the critical access to strategic future generation technology the industry provides are all factors which reach well beyond the industry itself. They indeed point in the direction of a leading-edge semiconductor industry being part of a common and Europe-specific interest.

More specifically, ESIA is concerned that the state aid reform might overlook the specificities of the semiconductor sector and the global constraints it operates under:

- The continued lowering of ceilings have made the Multisectoral Framework less effective for the type of larger-scale leading-edge investments Europe's semiconductor industry needs. They have also moved in a different direction to the Lisbon goals, as well as *vis-à-vis* other incentive schemes found around the world. Furthermore, the strictly regional context of the Framework may even tilt the level playing field within the EU. A void has been created which should be replaced with a more sectoral approach, which takes into account the R&D and capital intensity and the further characteristics of the semiconductor industry and offers answers to de-localisation of manufacturing and R&D, matching incentive schemes offered by other regions. This would support a focusing and targeting of "*certain state aid towards the objectives of the re-launched Lisbon strategy*." Results from our Report can be helpful in this respect. For example, they substantiate the development already recognized by DG Competition in previous communications² that Europe does not have the incentives to match other regions in semiconductors.

Already now our comparison of a model fab in eight different regions indicates that sectoral incentives are the single most significant differentiation factor, and to a significant extent the reason why – as an example – the estimated net cumulative income of a fab in 2010 in China or Korea will be 2.2 times that of the same fab in Germany. The magnitude of these differences induced by incentives schemes simply cannot be ignored by decision makers in the industry and should not be ignored by governments.

² E.g. C (2003)2511, 23.7.2003, page 7

- The implied recognition by the Commission in the State Aid Action Plan that pure R&D aid – as defined under the previous schemes – does not adequately resolve the need to foster innovation is a positive step. The current separation in R&D types is highly artificial and urgently needs revision. For semiconductors, the *fab is the lab* and manufacturing technologies go hand in hand with R&D and innovation. Fostering such innovation through incentive measures does not by definition distort competition but instead rewards industries that are creative. ESIA would plead for a broader definition of the concept of innovation as a legitimate ground for state aid which will – *inter alia* – lead to more concrete results and benefits from EU or national programmes. Replacing the distinction between industrial research and precompetitive development with a single category *industrial R&D* would be a way forward. In this context, we see a generalized tax credit on R&D spending for R&D-intensive industries such as the semiconductor industry in any European geographical area as one positive and constructive element of the R&D dimension of a sectoral approach.
- The State Aid Action Plan focuses on creating a level playing field within the EU. Next to this, a second dimension is the need to enhance European competitiveness, since competitiveness – and specifically that of Europe's semiconductor industry – is largely being measured in a global arena. Achieving a global level playing field should therefore be a second objective. Although it is encouraging that the Commission appears to be focusing on market failures or market corrections (equity) as a legitimate reason for a Member State to grant state aid, it is unclear whether these concepts are truly understood in their full scope. Apart from the obvious – mere – Internal Market related issues such as the existence of a super dominant player or the absence of an EU industry in a particular sector, the Commission should take into account the global competitive situation which is influenced by countries without state-aid restrictions. Otherwise it may well prove that Europe is making it impossible to achieve the Lisbon objectives. The fundamental upstream and downstream importance of the technology sector for a knowledge-based economy is recognised in every recent EU competitiveness study and our Report expands on the specifics for semiconductors. ESIA believes that this global competitive situation should be recognized within the context of state aid control.

A globally compatible state aid framework is a vital part of what will make the European semiconductor industry maintain and enhance its competitiveness. It is a tool Europe cannot afford to discard. By submitting this letter and attaching the Executive Summary of our Report, we hope to provoke sufficient interest to be able to engage you in an open and constructive meeting in the near future.

Yours sincerely,



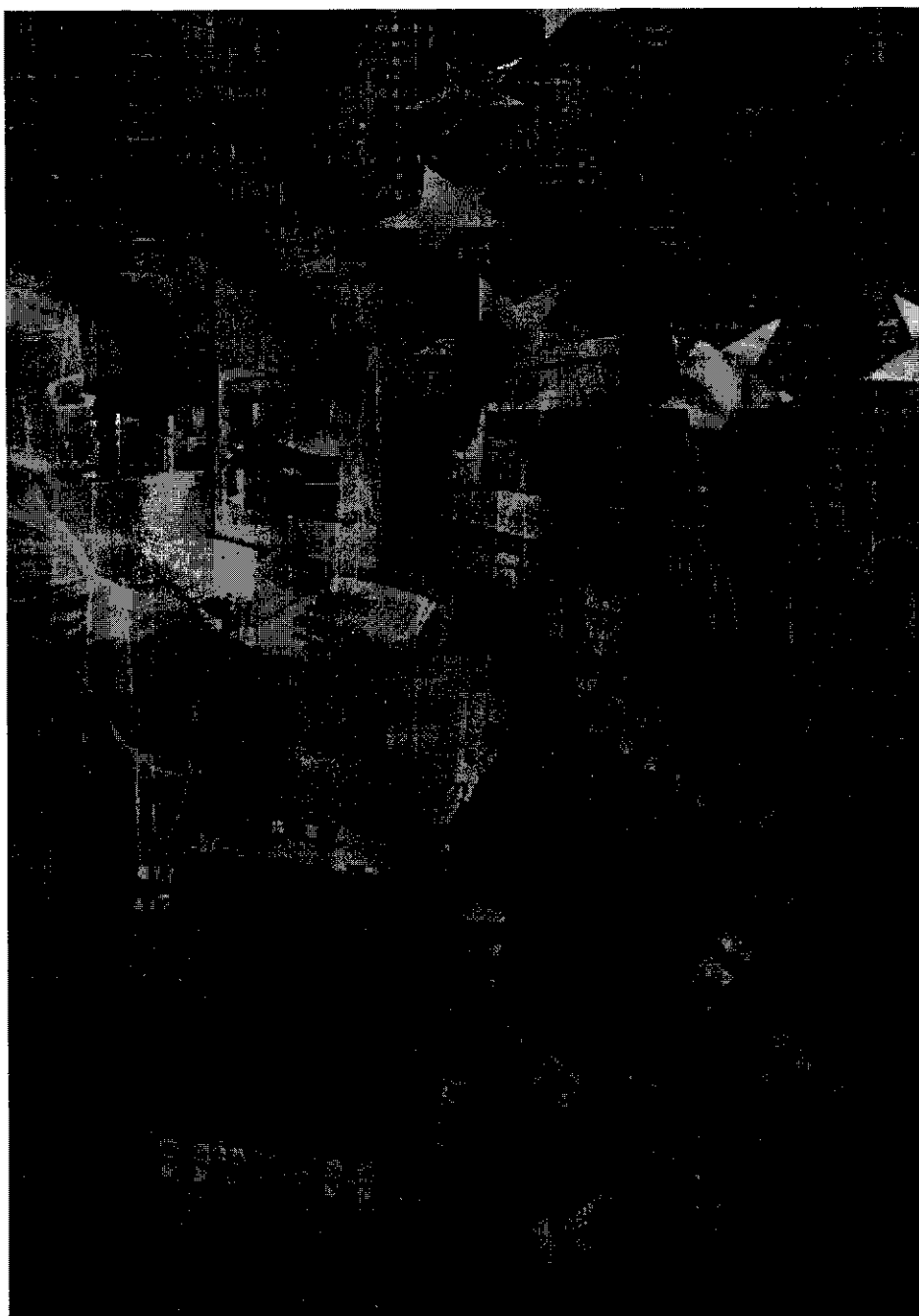
Carlo Bozotti
President EECA-ESIA
President & CEO STMicroelectronics

The European Semiconductor Industry: 2005 Competitiveness Report

Executive Summary

EECA ESIA

European Semiconductor Industry Association



Executive Summary

The question at the heart of this report is, how can the semiconductor industry in Europe maintain and enhance its competitiveness?

■ Why this report deserves special attention

The semiconductor industry is a key driver for the future of advanced technologies in Europe, and understanding it is therefore key to anticipating that future. The question at the heart of this report is, how can the semiconductor industry in Europe maintain and enhance its competitiveness? Because of its direct exposure to worldwide competition, understanding the opportunities and threats to this industry will enable stakeholders to address some of today's and tomorrow's challenges better, challenges reaching well beyond the industry itself and affecting the prosperity of Europe's economy at large and its citizens.

In Europe more than everywhere else, the semiconductor industry sector stands at a crossroads on the global playing field. The decisions taken in the immediate future will be decisive for determining which turning the industry will take. We, as the representatives of the industry in Europe, are determined to address the measures and actions that are required to enable the semiconductor industry to continue pursuing the formidable technological progress it has brought to end-user industries and to the economy at large. This is why the report outlines those aspects that make the semiconductor industry in Europe so uniquely important to the development of the European economy; indicates where Europe currently stands in comparison to other regions of the world; identifies which set of competitive factors Europe needs to focus on; and suggests actions that need to be taken. We see this report as a platform for further initiatives in specific areas of activity as well as a basis for discussing our recommendations with concerned decision makers.

■ What makes the semiconductor industry unique?

It is important to realize that this industry features a number of distinct characteristics that position it uniquely in the economy and in the global competitive arena. These include:

- *The very high intensity of R&D (up to 20% of annual revenues) and the required level of capital expenditures in semiconductor plants or 'fabs' (up to 25% of annual revenues).* Both are the industry's main characteristics. They are the prerequisites that ensure constant innovation, be it in terms of increased performance, miniaturization, cost reduction or ever shortening design cycles. They also make the industry highly sensitive both to the global research infrastructure and the financial returns on investments.
- *The role of the industry as technology enabler.* The semiconductor industry is widely recognized as a key driver for economic growth in its role as a multiple lever and technology enabler for the whole electronics value chain.

Semiconductor products form an increasingly vital part of a whole range of products ranging from electronic devices and systems (e.g. PCs, mobile phones, TV sets) to solutions and services (e.g. Internet

... from a worldwide base semiconductor market of \$213bn (EUR171bn) in 2004, the industry enables the generation of some \$1200bn in electronic systems business and \$5000bn in services, representing close to 10% of world GDP.⁷⁷

providers, telecom operators, broadcasting services). Revenues in the overall microelectronics industry have a multiplier effect on other major downstream sectors where electronic content is central. In other words, from a worldwide base semiconductor market of \$213bn (€171bn) in 2004, the industry enables the generation of some \$1200bn in electronic systems business and \$5000bn in services, representing close to 10% of world GDP.

The pervasiveness of semiconductors in other fields has become key to the industry's competitiveness: e.g., in the automotive industry for safety, energy consumption and driver assistance; in telecommunications for ubiquitous accessibility; in consumer applications for quality of products; etc. The global leadership of a number of European industrial sectors is a perfect illustration of how microelectronics represents a major if not predominant differentiating success factor and value added contribution in their respective markets.

- ✱ *Maximal exposure to international competition.* Dramatic changes in the conditions of global competitiveness have had an exceptionally strong impact on the semiconductor industry for over 20 years. For this reason, and as an advanced indicator of economic performance, it is mandatory for us to examine the present and future factors of success and failure with great care.
- ✱ *Continuous growth but in a cyclical pattern with high volatility.* While the current 20 year annual average growth of the semiconductor industry is on the order of 13%, this has been accompanied by equally above-average market volatility, which can lead to significant if not dramatic cyclical swings.
- ✱ *The need for high degrees of flexibility and innovation in order to constantly adjust to the rapid pace of change in the market.* Many products embedding semiconductor devices often have a very short life cycle. At the same time, the rate of constant price-performance improvement in the semiconductor industry is staggering. As a consequence, changes in the semiconductor market not only occur extremely rapidly but also anticipate changes in industries evolving at a slower pace. Yet another consequence of this rapid pace is that established market strongholds can be displaced all too quickly.

“There are real concerns of the industry about its future in Europe...”⁷⁸

■ Where do we stand in Europe? – The challenges we face

The original motivation of this report lies in the real concerns of the industry about its future in a Europe where strengths in one area are so rapidly undermined by weaknesses in others. Too often Europe appears to be its own worst enemy. The semiconductor industry in Europe has mobilized all its energy to face the challenges highlighted in this report.

- The European market represents approximately 20% of the world semiconductor market but *imports a much higher value from overseas that is not matched by equivalent exports*. Europe currently attracts less than 10% of investments in production capacity, which means that its future is in real danger. Can the semiconductor industry in Europe sustain growth and stay a source of innovation in such an environment?

... the EU lacks a dedicated sectoral approach to supporting this key industry.⁷⁷

■ Although Europe today enjoys a strong technological base, it also faces *structural weaknesses due to the information technology and computer industry's limited share in the economy*. In particular, we observe a comparatively smaller production of electronic goods for the mass consumer market (from PCs to videos) and attached services. These weaknesses slow down the productivity enhancing benefits of ITC diffusion in Europe, and reduce the semiconductor industry's capacity to reach the scale of production and market necessary to establish its products and applications as standards of competitiveness.

■ There are many positive, world-class examples of European R&D programmes and co-operation. There are also encouraging initiatives regarding specific technology platforms in Europe. Nevertheless, *these fall short of a coherent and consistent concept for stimulating R&D investment* in the private and public sector, investment needed in order to reach the vital Lisbon target of 3% of GDP for R&D spending. The biggest R&D potential today lies with partnerships among semiconductor industries as well as with co-operation schemes along the supply chain.

■ Whereas China, Japan, Korea, Malaysia, Singapore, Taiwan and the US have developed special incentive schemes to attract and retain foreign semiconductor investment, the EU lacks a dedicated sectoral approach to supporting this key industry. The revision of the Multisectoral Framework has actually reduced the financial support for the large investments that are necessary for leading edge semiconductor manufacturing facilities, leaving a void in large-scale future investment. As elsewhere, investment schemes have been crucial for supporting the build-up of a competitive and distinctly European semiconductor industry. From this perspective *the Multisectoral Framework should be replaced by a sectoral approach for semiconductors*.

■ Leaving aside other strategic factors, our snapshot cost comparison study of the factor costs involved in setting up a leading-edge model fab in eight locations in the world concludes that *the net cumulative income over a given period of time in China, Korea and Malaysia is around 220% times higher than for the same fab in Germany*, with little difference between key regions in Europe. Apart from the known differences such as lower wages, lower social costs and higher number of working hours, the main single difference shown by this international comparison is that of the existence of favourable incentive schemes in the emerging markets.

Considering the volatility of prices in the industry, these huge differences can be decisive for the survival of semiconductor companies in global competition. In light of such differences it also becomes more difficult to emphasize the perceived European strengths such as the existence of a highly skilled workforce and researchers along with the advantages of a sizeable internal market.

■ Where do we want to go – *laissez-faire* or restoring competitiveness?

The report lists ten competitiveness dimensions that are critical for the future of the semiconductor industry in Europe and which fall into three broad categories: *Investing for Europe*, *Level Playing Field*, and *Market Performance*.

14 *Investing for Europe* looks at factors that have a sustained effect on the competitiveness of Europe's semiconductor industry. Focusing on stronger capabilities in R&D, technical education and industry partnerships will impact on the future orientation of the industry's economic environment and can be determinant for its sustainability and competitiveness over time.

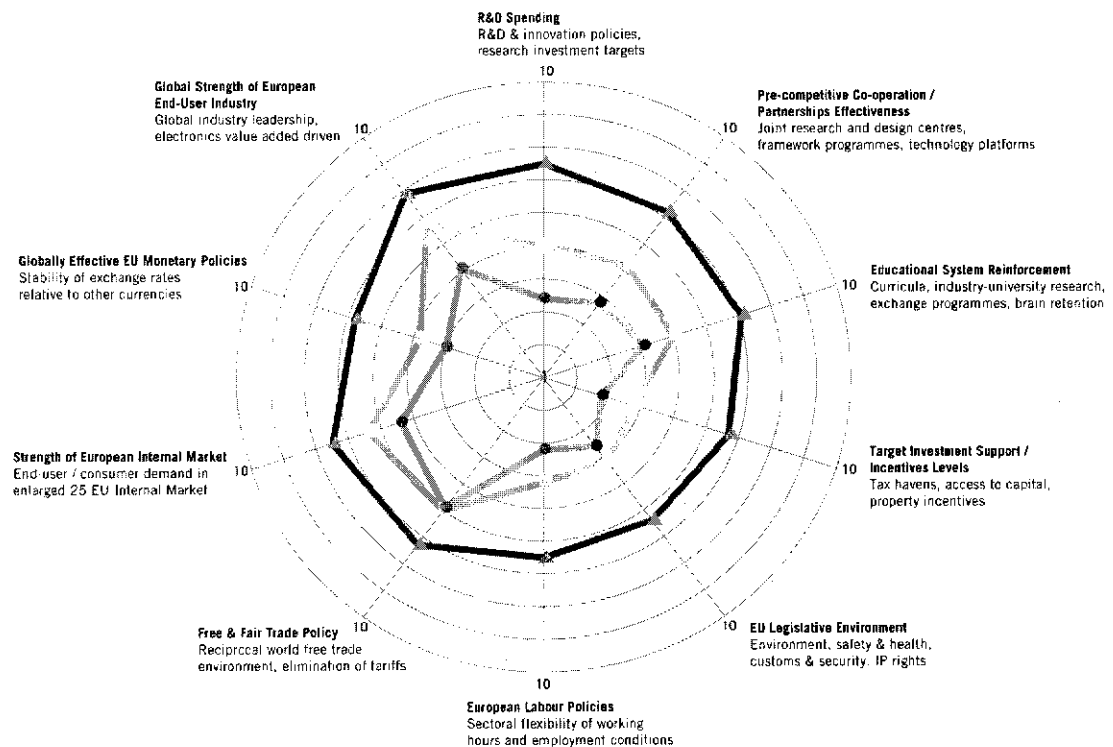
■ Establishing a *Level Playing Field* addresses the necessity of reaching comparable incentives and regulations for market entry, factor costs and legislative environment between regions and/or nations, thus avoiding disadvantages like the ones the European semiconductor industry is experiencing today.

20 *Market Performance* refers to the European economic position and conditions in the overall environment of the world economy that have a more or less favourable impact on the industry, such as, e.g., the impact of the Euro.

The competitiveness dimensions indicate possible directions for targeted measures or policies that would help enhance the competitiveness of the European semiconductor industry in the future. Depending on the responses to these indications, two alternative scenarios may unfold.

Alternative scenarios based on an assessment of selected competitiveness factors conducted by the members of EECA-ESIA

At Present State In a Laissez-Faire Scenario In a Restoring EU Competitiveness Scenario
Ranking in terms of "perceived as favorable to competitiveness" 1=least favorable 10=most favorable



... eliminating the obstacles to ensure that Europe fully reaps the benefits of a globally competitive industry at the cutting edge of technology.

■ **Laissez-faire:** The situation is left to the industry players themselves and no additional efforts are undertaken at the EU or national governmental levels to create incentives for innovation or to restore a level playing field.

■ **Restoring EU competitiveness:** Both the semiconductor industry and the EU and Member States embrace the competitive investment challenge and seek to initiate a virtuous circle throughout the semiconductor and the global end-user industry (see figure on page 5).

The advisability of taking the option of constructively and decisively building on Europe's strengths and resources is clear: It is the option of eliminating the obstacles to ensure that Europe fully reaps the benefits of a globally competitive industry at the cutting edge of technology. Faced alternatively with the slow decline of its manufacturing base, gradually followed by that of its R&D, the semiconductor industry in Europe is convinced that concerted initiatives which aim at actively investing for Europe, creating a level global playing field and focusing on market performance issues constitute the only way forward towards enhancing competitiveness.

■ A call for action from the semiconductor industry in Europe

In order to maintain and enhance the competitiveness of the Europe's semiconductor industry, EECA-ESIA calls on all concerned stakeholders to act upon the following recommendations:

■ Investing for Europe

For Europe's semiconductor industry, three crucial priorities stand out. It is essential to:

- unleash Europe's R&D capabilities and achieve the 3% or more of European GDP spending level for R&D. A crucial requirement to accomplish this is the introduction of a *generalized tax credit on R&D spending* for all companies in the semiconductor industry in any European geographical area.
- open up *Europe's educational system*, from technical school education to research institutes, so it can also work for the industry. The range of initiatives to be developed needs to address all levels, increasing the attractiveness of technology and inverting the present trend toward brain drain.
- develop further successful models of *future-orientated R&D partnerships* such as setting up a limited number of mega-projects and promoting three-way cooperation between industry, university and government, e.g. under the European technology platforms for nanotechnologies (ENIAC) or embedded intelligent systems (ARTEMIS), or through research programmes such as Medea+. Building on horizontal, pre-competitive semiconductor partnerships and programmes, these may be expanded to encourage vertical cooperation along the supply-chain.

■ Providing a level global playing field

For Europe to profit from an innovative semiconductor industry it is indispensable to provide a level global playing field that not only matches that of other regions but is Europe-specific. Hence we recommend:

- creating a *sectoral framework* that offers globally comparable incentive schemes for large investments.

Europe cannot afford to ignore what other regions in the world are striving to achieve.

“If our call for creating the conditions that enable the European semiconductor industry to express its winning innovation capability and market approach is heard loud and clear, this plea for action will have served its purpose.

- continuing to promote *free and fair trade*.
- ensuring a *European legislative environment* compatible with the imperatives of competitiveness, especially in the areas of environmental, safety & health (ESH) policies, customs & security and IP protection. Competitiveness has to be established as a criterion for legislation. Pooling the existing pockets of semiconductor expertise within European and national bureaucracies is an important pre-condition for creating the necessary awareness and coordination of targeted policies.
- establishing a *more balanced approach to ESH initiatives*, which promotes environmental practices and awareness without restricting innovative capacities.
- speeding up the implementation of *harmonised customs & security procedures*, an area that warrants particular attention given the nature of Europe's diverse boundaries and traditions.
- allowing for *more flexible labour conditions*, in particular facilitating a better organisational alignment of working hours - in terms both of total amounts and distribution - to meet the competitiveness requirements of today's global market.
- rationalizing and simplifying procedures for *effective IP protection in Europe*, which is key to protecting competitiveness both within and outside Europe.

Answers for maintaining and enhancing the competitiveness of the European semiconductor industry are within close reach. Indeed, some of the measures mentioned are common to many industries in Europe and should reinforce a general industry perspective. Many are already on government action agendas.

However, as illustrated in the above Figure, *all* of these measures are especially relevant to the semiconductor industry inasmuch as they apply to the industry's characteristics and competitiveness factors. Two prerequisites have to be emphasized here, which will give these recommendations a better chance of enactment:

- It will be the *whole* rather than the sum of parts of the recommended actions that will determine the future of the semiconductor industry in Europe and help shape the European environment it needs to compete at the leading edge of the information society.
- It will require the concerted and explicit *will* of all concerned actors, i.e., EU authorities, national governments and industry representatives, to focus their joint attention on the unambiguously essential role semiconductors play in Europe as a catalyst and accelerator for economic performance and the quality of life of society as a whole.

Europe cannot afford to ignore what other regions in the world are striving to achieve. If our call for creating the conditions that enable the European semiconductor industry to express its winning innovation capability and market approach is heard loud and clear, this plea for action will have served its purpose.



EECA-ESIA

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