

SPECIAL FEATURES

European semiconductors matters

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ABSTRACT

The impact of lower cost manufacturing regions on traditional industrialized nations has been well documented. Europe is facing renewed pressure to give up or relocate semiconductor and general electronic product production to Asia in general and China in particular. We discuss the trends taking place and current issues facing the European semiconductor industry while highlighting a path for progress that few seem willing to tread.



Electronics is now the biggest manufacturing industry in the world. What is more, it is growing at an average annual rate of eight percent per year, and getting even bigger. Driven by the relentless advances in semiconductor electronics, micro-electronics firms around the world are producing over 1,000 million transistors a second, each costing less than one thousandth of a US cent, less than one tenth the price of an office staple. The electronic circuits they produce are fundamentally, and irreversibly, changing the world we live in, and with it creating vast new industries and economic potential.

Thankfully Europe's microelectronics firms are playing a full role in the digital economy, by providing either the ICs, the microscopic brains – the heart and pulse of the information economy or the means to produce them. With rare exceptions, sadly the same cannot be said for Europe's OEM industry.

Yet it was not always this way for the microelectronics firms either. In the mid-1980s, the European micro-electronics industry was in a poor state. It lacked the technology of its American and Japanese competitors and, equally important, it lacked the stimulus of large European demand. European systems companies had in world terms, a relatively poor positioning in computer hardware manufacture and, to a lesser extent, in consumer electronics. The newer applications in telecommunications and the automotive sectors, which are increasingly important today, were not then major demand drivers.

A direct consequence of the fact that there were no 'killer' applications driving the European market was that semiconductor suppliers attempted to serve many small segments of the market rather than one or two larger segments. Suppliers were supporting far too many processes; at least eighty separate processes could be identified in 1985, they were overstaffed and surviving only as the result of government handouts and protectionist measures. Conventional wisdom from their US and Japanese peers – Korea or Taiwan were not yet factors in the market – was that Europe should give up on semiconductors and buy from them instead.

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European semiconductors matters



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Cooperation in European microelectronics R&D



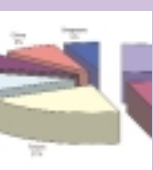
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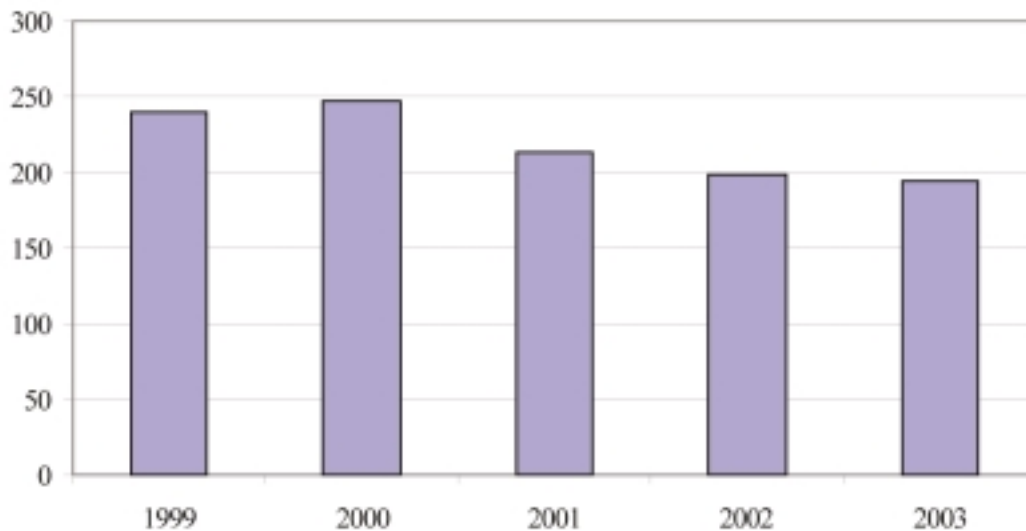
Challenges and opportunities for collaboration within the semiconductor industry



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300mm activity report: January to April 2004





Source: Future Horizons

Figure 1. European Electronics Equipment Production (Billions of US Dollars).

Following a period of significant restructuring during the 1980s and the early part of the nineties, including not just major amalgamations, such as that between SGS and Thomson, but also a marked reduction in the number and variety of design and manufacturing processes supported, all three of Europe's top semiconductor firms are now in the worldwide Top Ten; growing faster than their international competitors; are more profitable than the industry average; and have a technology base that is second to none. Europe is also leading the world in developing the next generation manufacturing technology, from photolithography to 300mm production.

In contrast, several of the major US firms are now in danger of extinction, including Motorola – once the icon of the 1980s, and Japan's semiconductor industry has been brought to its knees, resulting in its own recent sizeable and significant restructuring programme.

Some of the credit for this beneficial concentration of effort and investment in Europe stems from the European collaborative initiatives that started with the mid-1980s Mega-Project, grew into JESSI and gained strength after strength via MEDEA and now MEDEA+. Such programmes reinforced the much needed focusing that was already under way, concentrating resources on a limited number of topics. The result is a much closer and deeper collaboration than was seen in the past.

The programmes per se were the means not the end, and the real driving force behind this transition was the guts and determination of Europe's then microelectronics leaders and the belief by some – but by no means all – of Europe's governments that to loose control of the microelectronics sciences would mean to loose control of the products and industries they enable. In a radical break from past government traditions, support was a catalyst for change; the real change came from the leaders themselves – determined to fight for and capture world markets, and make their companies internationally competitive, both in terms of cost and technology.

The Dutch, French, Italian and to a lesser extent German firms and governments were the most pro-active with this new found initiative, and the UK the least. It is hardly by coincidence that we now find the Franco-Italian giant STM, Infineon Technologies, Philips, ASML and Siltronic (Wacker) all ranked amongst the world's market leaders, whereas the UK semiconductor industry – once a pioneer in its field, has been reduced to either a handful of boutique curiosities or a source of design skill and IP. The impact has also not been lost on the bottom line, and Europe is now a net exporter of ICs, whereas in the 1980s, it has forced to import around two-thirds of its needs.

What then on the OEM front? Sadly, with a few notable exceptions, Europe's scorecard has changed little since the 1980s. European electronics equipment production has been steadily falling, and is now faced with a US\$40 billion (20 percent) trade deficit, Figure 1.

The last recession saw a deluge of firms move production to Eastern Europe and China with conventional wisdom being Europe can never be globally competitive in manufacturing. To quote Pasquale Pistorio, President & CEO of STMicroelectronics (Vienna, 1986) "If you don't believe it can be done, it won't be done"; such 'wisdom' is a self-fulfilling kiss of death for Europe.

So who then is to blame for this sorry state of affairs? Certainly the governments and the European Union, who collectively have burdened Europe's manufacturing industries with ever-increasing red tape and taxation. Sadly, this is not a new problem, indeed a look back over the past 20 years, Figure 2, shows the lack of importance Europe's political elite have show to industry, with the focus seemingly worsening rather than improving.

But governments and politicians are only partly to blame – their role in life is to create an environment whereby business can flourish. The main criticism must therefore be levelled squarely at Europe's OEM leaders, who seem content to allow Europe's

1984 <ul style="list-style-type: none"> <input type="checkbox"/> Sugar Beet <input type="checkbox"/> Rape Seed Oil <input type="checkbox"/> Butter Mountains <input type="checkbox"/> National Champions 	1994 <ul style="list-style-type: none"> <input type="checkbox"/> Federalism <input type="checkbox"/> Endless Red Tape <input type="checkbox"/> Increasing Regulation <input type="checkbox"/> Inefficient Industries 	2004 <ul style="list-style-type: none"> <input type="checkbox"/> European Constitution <input type="checkbox"/> Moribund Economy <input type="checkbox"/> High Unemployment <input type="checkbox"/> Control Freak Bullying
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Figure 2. Europe's Political Backdrop.

uncompetitiveness to fester, rather than demand the changes required for Europe to be globally competitive.

All too often, Europe's electronics industrial elite takes the path of least resistance – moving production to the Far East and focusing Europe on design. There are two fundamental flaws to this implied rationale – that Europe's role is to focus on intellectual, not manufacturing, activities. First, one of wealth creation potential and the fact that the farther you are away from the end product, the less the share of the profit will be. It is also very hard to leverage such brain power, a lesson currently being learnt by Europe's IP and IC design house community, versus the (higher risk, but potentially more rewarding) preferred US fabless model.

Second, the ever-shortening time to market and market windows. Both of these trends are closing the physical gap between the IP and end product development teams, with the underlying need for design to be close to the end market. It also presupposes an elitist view of the world that emerging countries such as China and India are incapable of developing IP, something that is clearly untrue.

Conclusion

To give up on manufacturing is to give up on technology, not just because other regions will be more than capable of developing their own IP, but also because there will be no local driver to pull through demand. What is required

is industrial drive first, followed by government and politically friendly initiatives. Politicians will react once they feel the political heat, but right now the heat from Europe's industrialists is nonexistent. Just where are Europe's electronics men on vision?

ABOUT THE AUTHOR

Malcolm Penn is the Chief Executive Officer of industry analyst firm Future Horizons.

Mr Penn has over 40 years experience in the electronics industry and for most of that time has worked extensively throughout Europe and the United States, the former USSR, Japan and Korea. His industrial experience has involved him in all aspects of the management, manufacturing, marketing and use of semiconductor devices.

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