Towards Sustainable Industrial Competitiveness Policy

Issues paper to EU Ministers of Industry Council Part I

General framework

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Preface

In the current economic climate, and with a new European Commission just starting, expectations about the EU's ability to advance in the development and implementation of coherent and coordinated economic and competitiveness policies is high. There is a clear need to revisit the key components of an integrated industrial policy for sustainable competitiveness. It is important to further define the Europe 2020 ambitions and translate them into concrete policies that will contribute to recovery and long-term competitiveness of EU industry as a whole. Within this context the EC is preparing a Communication on Sustainable Industrial Policy in the autumn of this year.

This issues paper is being prepared on request of the Belgian Presidency. It aims to inform the preliminary conclusions of the Industry Council of the EU, based on evidence which can be confronted with the European Innovation Plan and the Commission's Communication on Industrial Policy.

This Issues paper consists of the presentation of a general framework for Sustainable Industrial Competitiveness Policy (this Part I), followed by two contributions where this framework is applied to specific situations: SMEs, Innovation and Growth (Part IIA) and Transformation and Resource-intensive Industries (Part IIB).

Brussels, 18th June 2010

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Sustainable industrial competitiveness policy: context, challenges and future directions.

1.1 Introduction

The 2007 analysis that industry is generally healthy and dynamic no longer applies…

In 2007, when the European Commission undertook its mid-term evaluation of industrial policy[1] – as set out in the 2005 Communication on an integrated approach to industrial policy[2] – it was able to point to rather benign conditions under which "*in general, industry is healthy and dynamic, contributing substantially to growth and jobs in the Community*". Fatefully, the subsequent financial and economic crisis has had a dramatic impact on European industry, with industrial output falling by around one-fifth and employment in manufacturing decreasing by around ten percent. While there are currently signs of improvement in the economic situation, the prospects for a return to sustained growth remain fragile, not least due to the poor state of public finances that has already led to major problems in Greece and still threatens other Member States.

One feature of recent events has been the rapid transmission of problems across different areas of the economy, further revealing the extent and depth of interdependence that is inherent in economic globalisation. What began as a home-loans crisis in the US quickly spread to the financial sector in Europe. In turn, as credit markets were squeezed and business and consumer confidence fell, the 'real' economy slumped. With economic growth stalled, the repercussions have spread from the private to the public sector. While policy makers appear to have been caught 'off-guard' by the speed of transmission of the crisis, they have also found themselves largely impotent when trying to halt its spread. At the same time, it has proved beyond the capacity of individual countries to respond effectively to the crisis, highlighting the need for coordinated supra-national responses, not just at a European level but also at a broader international (global) scale.

The EU is now at a crucial moment of transformation …

While globalisation, together with many of the other underlying long-term challenges facing society (e.g. environment and pressure on resources, technological development, demographic change) are well recognised, the financial and economic crisis has served to drive home the reality of this situation. Certainly, such a view appears to underlie the explicit appeal contained in the Preface to the Commissions EU2020 Strategy[3] that the crisis should provide a "*wake up call*" for the EU. The Strategy presents the EU as being at a "*moment of transformation*", for which policies need to be developed to redress the losses that have resulted from the crisis, to respond to structural challenges, and to cope with the increasing speed of global economic and technological change. Beyond seeking

[1] COM(2007)374
[2] COM(2005)474
[3] COM(2010)2020

to instil a sense of urgency for the development of policies necessary "*to deliver smart, sustainable and inclusive growth*", the Strategy is also carried by an undercurrent of sentiment that achieving the necessary transformation of the European economy will require actions – both by policy makers, the private sector and citizens – that go beyond incremental adjustments and tinkering with conventional practices.

In outlining the scope of the Flagship Initiative for '*An industrial policy for the globalisation era*' (see Box 0.1), the EU2020 Strategy sets out the Commission's ambition – in collaboration with stakeholders – to develop "*a framework for a modern industrial policy*". The Commission will thereto issue a new Communication on industrial policy in the autumn of 2010.

Aim of these papers: a broader reflection on the longer term needs to combine sustainable development with industrial competitiveness policy

Now is a good moment to take a 'step back' from immediate concerns…

Given the forthcoming Communication, it is an opportune moment to evaluate whether the current EU-level approach to industrial policy and the approaches pursued at national and sub-national levels by Member States are both adequately aligned and sufficient to meet current and future challenges. At the same time, while policy priorities over the recent past have largely been determined by the need to respond to the impact of the economic and financial crisis, it is perhaps also a moment to take a 'step back' from immediate concerns in order to identify some of the key issues that will need to be addressed by a 'modern' industrial policy. In this respect, there are some fundamental questions to be asked about the long-term objectives of industrial policy, the changes within industry and the supporting business environment seen as necessary to deliver economic growth and secure jobs, and the contributions that can be made by public policy to facilitate the successful transformation of industry to meet the challenges of the future.

While it is possible to identify a host of challenges facing EU industry and European society as a whole, it is evident that central among these are the challenges resulting from the pressures created by economic development – from local to global levels – on the environment, on energy consumption and on resource utilisation. The articulation between sustainable development and industrial competitiveness is inevitable going to be among the central themes – and most likely the main overarching theme – for future industrial policy. It is for this reason that we have chosen the label of '*Sustainable Industrial Competitiveness Policy*' to encapsulate a new (or 'modern') approach to industrial policy. We consider that the primary role of sustainable industrial competitiveness policy is to facilitate the adaptation and transformation of industry while contributing to achieving (and maintaining) the competitiveness of industry in accordance with sustainable development objectives[4].

The two papers that accompany this first introductory paper take forward the idea of sustainable industrial competitiveness policy in the context of the specific themes of '*SMEs, innovation and growth*' (Part IIA) and '*Transformation and resource-intensive*

[4] Narrowly defines, these objectives imply that competitiveness should be achieved while using resources (including energy) in an efficient and sustainable way while minimising negative environmental impacts. More broadly, competitiveness should be achieved while respecting broader social welfare objectives, such as social equity and cohesion. For further discussion, see Section 1.7

industries' (Part IIB). These two themes are closely linked to two of the Flagship Initiatives proposed under the EU2020 Strategy, namely "*Resource efficient Europe*" (see Box 0.2) and "*Innovative Union*" (see Box 0.3). As background to the current EU industrial policy environment and, hopefully, to provide some clarity regarding key concepts related to industrial competitiveness and sustainability, the Annex to this paper provides a description of the current status of EU industrial policy as developed over the last decade or so. Further it tries to outline some of the main issues relating to the scope and content of current industrial policy measures.

In this present paper, we will attempt to set in a broader and more general context some of the key issues that we consider should – or at least could – be addressed by an EU Sustainable Industrial Competitiveness Policy. In this regard, the following sub-section looks at some of the implications of technology-driven developments for the external competitiveness of EU industry. While far from comprehensive, the purpose is to illustrate some of the factors leading to changes in global competition and competitiveness and that will shape the future policy-setting environment.

1.2 Trade performance, external competitiveness, technology and innovation

Despite the economic and financial crisis, the external competitiveness of EU industry may be stronger than presumed

If external trade performance provides a 'litmus text' for industrial competitiveness and the effectiveness of industrial policy then, although EU industry has been severely hit by the financial and economic crisis, there are some positive signs that the EU has performed relatively well compared to its main (advanced economy) competitors; for example, the EU's recent trade performance appears somewhat better than that of the US and Japan[5]. While it is too early to draw clear conclusion, this suggests that the overall external competitiveness of EU industry is stronger than some may have presumed.

The intrinsic technological level of a sector is not a shield from competition from emerging economies

In trying to understand the factors driving the external competitiveness of EU industry, it is perhaps instructive that even though EU industry has been chastised in the past for not occupying a sufficiently strong position in so-called 'high-tech sectors', it is precisely sectors such as semi-conductors and electronic components, computers, radio and television equipment, that have proved amongst the most vulnerable to the crisis and, more structurally, to the challenge of emerging economies. The ability of emerging economies to position themselves as major competitors in so-called 'high-tech' sectors has demonstrated that the intrinsic technological level of a sector is not a shield against competition. We have seen, for example, that when emerging country competitors have been able to finance the major capital outlays required to invest in 'high-tech' production facilities (e.g. semi-conductors) or where technologies have been applied through standardised and repetitive high volume production processes (e.g. consumer electronics), they have become major – and in many cases dominant – competitors.

Explanations of the increasing presence of emerging economies in 'high-tech' sectors can be linked to the accelerating speed of technological development and technology diffusion. As new technologies are superseded by even 'newer' ones and competitors are

[5] European Commission (2010) "EU Manufacturing Industry: What are the challenges and Opportunities for the Coming Years"

able to access, replicate and apply new technologies, the specific competitive advantage that they confer disappears. When this occurs, technologies essentially become 'commoditised' and more similar to other factors of production whose impact on competitiveness is largely determined by their cost and the efficiency of their integration in production processes. In turn, this raises the pressure to shift production of 'commoditised' technologies to low cost production locations. Here we can see the importance of the rapid advances that have been made in information and communication technologies (ICT) that have considerably increased technological mobility[6]. Thus, while developments in ICT have expanded the possibilities for creating competitive advantage through new technological developments and innovation, it represents something of a 'double edged sword' that can simultaneously hasten the demise of specific technology-based – or, more broadly knowledge-based – competitive advantages.

Rapid technological development as a 'double edged sword'…

Following from the above, we have seen that developments in ICT, which have resulted in rapidly falling communication and coordination costs for businesses, have profoundly altered the global organisation of production for industrial and service activities alike. Not least, they have facilitated the fragmentation of production processes, both in terms of vertical segmentation within value chains and their geographical distribution. The impacts on competition have often proved complex, unpredictable, and resulted in sudden changes of in the relative competitiveness of countries and regions[7]. Today, it is possible to identify a whole range of further enabling technologies – biotechnology, nanotechnology, new materials, etc. – that may similarly bring about further major changes in the organisation of production, in competition, and in the determinants of international competitiveness[8]. From a positive perspective, these technologies have the potential to generate new products, new activities and create the basis for new industries to evolve, as well as transforming existing ones. A more negative view can point to their potential to render existing competitive advantages obsolete and, eventually, to further expose industry to increased cost-driven competition as the technologies become more widely available. Overall, the experience of the transformations brought about as a result of ICT provide a strong argument for giving more attention to identifying the wider potential impacts of new emerging technologies for international competition and competitiveness.

The external competitiveness of EU industry is linked to capabilities rather than to sectors…

Looking behind the overall relatively strong recent trade performance of EU industry, perhaps one lesson to be learnt is that technologically orientated explanations have arguably less to do with the technology categorisation of sectors *per se* (i.e. low-, medium- or high-tech) and more to do with capabilities of EU enterprises to successfully integrate and to apply technologies in innovate ways (i.e. product differentiation), or to adapt technologies to specific market requirements (i.e. product specialisation) irrespective of the aggregate level of technological sophistication of a sector. The fact that

[6] In particular, ICT has expanded the possibilities to codify – or formalise – knowledge underpinning an increasing range and complexity of technologies, making such knowledge more mobile and facilitating its transfer to different production locations (e.g. emerging economies). At the same time it has significantly reduce the coordination costs inherent in operating and integrating geographically spread production activities.

[7] See Section 1.6.

[8] In fact, such developments have led some commentators to contend that the world economy is evolving towards a new techno-economic paradigm. See, for example, Freeman, Chr. and Louçã, Fr., *As Time Goes By. From the Industrial Revolutions to the Information Revolution*, Oxford: Oxford University Press, 2001; Tunzelmann G.N. (von), *Technology and Industrial Progress. The Foundations of Economic Growth*, Cheltenham, Lyme: Edward Elgar 1995, Perez, C., *Technological Revolutions and Financial Capital. The Dynamics of Bubbles and Golden Ages*, Cheltenham, Northampton: Edward Elgar, 2002.

the EU has proved able to remain competitive in specific segments within many 'medium-tech' and sometimes even in 'low-tech' sectors demonstrates that competitiveness is not just about generating new technologies but it is also about successfully implementing new technologies in specific and innovative ways, even in sectors with lower average technology levels.

There is more than simply encouraging 'bright innovators' and 'young innovatie high-tech SMEs'…

It follows from the preceding paragraph that technology driven – or supported – transformation processes not only involve high-tech manufacturing sectors but also involve innovative applications of technology in lower-tech sectors, both in manufacturing and services. It is also aligned with the idea of *smart-specialisation.* Smart specialisation also emphasises the importance of (local) entrepreneurial actors able to identify opportunities and to develop (innovative) complementarities and synergies with available existing capacities and competences[9]. This, in turn, is not simply about encouraging 'bright innovators' and 'young innovative high-tech SMEs', even though these may be important. Rather, it reflects the much broader context and diversity of enterprises that make-up the overall industrial base and that are subject – directly or indirectly – to the pressures of international competition.

Technology-related and entrepreneurial capabilities are, however, far from alone in explaining the external competitiveness of EU industry. Other factors such as quality, branding, customisation and provision of product-related services, can also be identified as crucial for enabling EU industries to position themselves in 'up-market' and 'high value-added' product segments[10]. This points to the importance for competitiveness of a wider range of 'softer' competences or 'know-how' – such as cultural or market awareness, communication and marketing skills, customer service quality and so forth – that go beyond technical knowledge and expertise in a classic sense.

… Intangible factors increasingly underpin the ability of firms to differentiate themselves from their competitors

The above assessment should not be taken to imply that tangible production factors (e.g. labour, physical capital, raw materials and intermediate inputs) are unimportant, as it is evident that their cost, quality and the efficiency of their use are crucial determinants of productivity and relative cost competitiveness for many industries. Rather, while tangible factors provide the bedrock for (external) competitiveness, increasingly the factors that underpin the ability of firms to differentiate themselves from their competitors are intangible. At the same time, the variety of sources and mechanisms by which intangible-based competitive advantages may be derived points to the importance for firms to be able to access a wide range and often complex set of production inputs, skills and know-how. While it is possible that the relevant knowledge and 'know-how' may be created internally within firms, often – particularly for SMEs – it will necessitate drawing upon specialised competences from outside the firm.

[9] See, for example: Dominique Foray, Paul A. David and Bronwyn Hall (2009) "Smart Specialisation – The Concept", Knowledge Economists Policy Brief n° 9, June 2009

[10] See: Louise Curran & Soledad Zignago (2009) "Evolution of EU and its Member States' Competitiveness in International Trade", CEPII WP 2009-11, June. Comparing the unit values of trade to assess the relative product positioning of EU and its competitors and based on 2004 data for non-energy trade, they estimate that the EU accounted for 31% of world trade in 'up-market' product segments, compared to only 15% for the US and 13% for Japan. Moreover, while some 46% of EU exports are categorised as 'up-market', the corresponding proportions for the US and Japan are only 35% and 38%.

A broad-based, diversified and inter-linked business tissue is important for industrial competitiveness

This points to the importance for industrial competitiveness of a broadly-based business tissue able to provide both the necessary technological inputs and a full range of supporting competences. This can be related to intra and inter-industry linkages (e.g. the breadth and depth of the technological and industrial base) and – as many of the required competences are more closely related to service activities as opposed to industrial production processes – the strength of inter-linkages between industry and (business-related) services[11]. As pointed to recently by the European Commission:

> "The traditional view that treats industrial sectors as homogeneous, independent and national thus no longer seems to be an adequate basis for policy development. Excellence at all levels has become much more important and increasingly suppliers and innovation partners from different sectors, regions and with complementary competences are needed"[12]

This statement points to the importance of maintaining a diversified industrial base. At the same time, this need not necessarily be seen in terms of the diversity of (traditional) industry sectors but, rather, on the diversity – and specialisation – of industrial and supporting competences.

As emerging economies increase their own technological capabilities it is less evident to identify those activities and market segments where they will become major competitors

Looking forward, the challenges to the external competitiveness of EU industry can be expected to increase, both in terms of the general magnitude of pressures on industry and in terms of increasingly affecting those industrial sectors and activities where the EU industry currently maintains a competitive advantage. It was always fairly predictable that globalisation would reinforce the competitive advantages of emerging economies derived from low production costs – particularly for labour – and that they would occupy a strong position in low-technology market segments. However, as has been seen, the sector strengths and positions of emerging economies in other market segments has sometimes been far from predictability and is likely to become even less obvious as these economies seek to move to higher value-added market segments. As emerging economies, such as China, India or Brazil, increase their own technological capabilities, it may become far from evident to identify those industrial activities and market segments where they will become important competitors in the future.

Competition from other 'advanced' economies can be expected to emphasise technological development and innovation as a source of competitive advantage

At the same time, the rise of emerging economies will pose similar challenges for industry in other 'advanced' economies as those that face EU industry. Moreover, with low growth prospects for 'advanced' economies they will also be looking to take advantage of faster growth and increasing market size in emerging regions. Once again this is likely to increase the pressure of competition in international markets, in particular in those 'up-market' and 'high value-added' product segments where EU industry is present. On the one hand, this will increase the need for EU industry to maintain cost competitiveness and productivity at levels that enable it to remain competitive vis-à-vis these competitors. On the other, it can be expected to emphasise the importance of technological development and innovation as a source of competitive advantage. The prospect that the EU's rivals may steal the lead in areas of technology where EU industry is currently well-positioned cannot be discounted, particularly as they also search to take advantage of opportunities in prospective growth markets. This may further increase the

[11] See Section 1.4.
[12] Ibid. footnote 5.

possibility of shifts in relative competitiveness in ways that are difficult to foresee, and which may prove more sudden and sometimes brutal than was hitherto the case.

The general scenario alluded to above is reflected in the EU2020 Strategy. While reiterating the importance of international trade to EU prosperity, the EU2020 Strategy points to the need to raise productivity while emphasising the potential threat to the EUs leadership in one specific technological field – namely 'green solutions' – that may come from competitors from both 'advanced' and 'emerging' economies:

> "The EU has prospered through trade, exporting round the world and importing inputs as well as finished goods. Faced with intense pressure on export markets and for a growing range of inputs we must improve our competitiveness vis-à-vis our main trading partners through higher productivity. We will need to address relative competitiveness inside the Euro area and in the wider EU. The EU was largely a first mover in green solutions, but its advantage is being challenged by key competitors, notably China and North America. The EU should maintain its lead in the market for green technologies as a means of ensuring resource efficiency throughout the economy, while removing bottlenecks in key network infrastructures, thereby boosting our industrial competitiveness."

Box 0.1 EU 2020 Flagship initiative "An industrial policy for the globalisation era"

Industry and especially SMEs have been hit hard by the economic crisis and all sectors are facing the challenges of globalisation and adjusting their production processes and products to a low-carbon economy. The impact of these challenges will differ from sector to sector, some sectors might have to "reinvent" themselves but for others these challenges will present new business opportunities. The Commission will work closely with stakeholders in different sectors (business, trade unions, academics, NGOs, consumer organisations) and will draw up a framework for a modern industrial policy, to support entrepreneurship, to guide and help industry to become fit to meet these challenges, to promote the competitiveness of Europe's primary, manufacturing and service industries and help them seize the opportunities of globalisation and of the green economy. The framework will address all elements of the increasingly international value chain from access to raw materials to after-sales service.

At EU level, the Commission will work:

- To **establish an industrial policy** creating the best environment to maintain and develop a strong, competitive and diversified industrial base in Europe as well as supporting the transition of manufacturing sectors to greater energy and resource efficiency;
- To **develop a horizontal approach to industrial policy** combining different policy instruments (e.g. "smart" regulation, modernised public procurement, competition rules and standard setting);
- To **improve the business environment**, especially for SMEs, including through reducing the transaction costs of doing business in Europe, the promotion of clusters and improving affordable access to finance;
- To **promote the restructuring of sectors** in difficulty towards future oriented activities, including through quick redeployment of skills to emerging high growth sectors and markets and support from the EU's state aids regime and/or the Globalisation Adjustment Fund;
- To **promote technologies and production methods that reduce natural resource use**, and increase investment in the EU's existing natural assets;
- To **promote the internationalisation of SMEs**;
- To **ensure that transport and logistics networks enable industry throughout the Union to have effective access to the Single Market and the international market beyond**;
- To **develop an effective space policy** to provide the tools to address some of the key global challenges and in particular to deliver Galileo and GMES;
- To **enhance the competitiveness of the European tourism sector**;
- To **review regulations to support the transition of service and manufacturing sectors to greater**

resource efficiency, including more effective recycling; to **improve the way in which European standard setting works to leverage European and international standards for the long-term competitiveness of European industry**. This will include promoting the commercialisation and take-up of key enabling technologies;

– To **renew the EU strategy to promote Corporate Social Responsibility** as a key element in ensuring long term employee and consumer trust.

At national level, Member States will need:

– To **improve the business environment especially for innovative SMEs**, including through public sector procurement to support innovation incentives;
– To **improve the conditions for enforcing intellectual property**;
– **To reduce administrative burden on companies**, and improve the quality of business legislation;
– To work closely with stakeholders in different sectors (business, trade unions, academics, NGOs, consumer organisations) to identify bottlenecks and **develop a shared analysis on how to maintain a strong industrial and knowledge base** and put the EU in a position to lead global sustainable development.

Source: COM(2010)2020

Box 0.2 EU 2020 Flagship Initiative "Resource efficient Europe"

The aim is to support the shift towards a resource efficient and low-carbon economy that is efficient in the way it uses all resources. The aim is to decouple our economic growth from resource and energy use, reduce CO_2 emissions, enhance competitiveness and promote greater energy security.

At EU level, the Commission will work:

– To **mobilise EU financial instruments** (e.g. rural development, structural funds, R&D framework programme, TENs, EIB) as part of a consistent funding strategy, that pulls together EU and national public and private funding;
– To enhance a **framework for the use of market-based instruments** (e.g. emissions trading, revision of energy taxation, state-aid framework, encouraging wider use of green public procurement);
– To present proposals to **modernise and decarbonise the transport sector** thereby contributing to increased competitiveness. This can be done through a mix of measures e.g. infrastructure measures such as early deployment of grid infrastructures of electrical mobility, intelligent traffic management, better logistics, pursuing the reduction of CO_2 emissions for road vehicles , for the aviation and maritime sectors including the launch of a major European "green" car initiative which will help to promote new technologies including electric and hybrid cars through a mix of research, setting of common standards and developing the necessary infrastructure support;
– To accelerate the implementation of **strategic projects with high European added value to address critical bottlenecks**, in particular cross border sections and inter modal nodes (cities, ports, logistic platforms);
– To complete the **internal energy market** and implement the **strategic energy technologies (SET) plan**, promoting renewable sources of energy in the single market would also be a priority;
– To present an initiative to **upgrade Europe's networks**, including Trans European Energy Networks, towards a European supergrid, "smart grids" and interconnections in particular of renewable energy sources to the grid (with support of structural funds and the EIB). This includes to promote infrastructure projects of major strategic importance to the EU in the Baltic, Balkan, Mediterranean and Eurasian regions;
– To adopt and implement a revised **Energy Efficiency Action Plan** and promote a substantial programme in resource efficiency (supporting SMEs as well as households) by making use of structural and other funds to leverage new financing through existing highly successful models of innovative investment schemes; this should promote changes in consumption and production patterns;
– To establish a **vision of structural and technological changes required to move to a low carbon,**

resource efficient and climate resilient economy by 2050 which will allow the EU to achieve its emissions reduction and biodiversity targets; this includes disaster prevention and response, harnessing the contribution of cohesion, agricultural, rural development, and maritime policies to address climate change, in particular through adaptation measures based on more efficient use of resources, which will also contribute to improving global food security.

At national level, Member States will need:

- To **phase out environmentally harmful subsidies**, limiting exceptions to people with social needs;
- To **deploy market-based instruments** such as fiscal incentives and procurement **to adapt production and consumption methods**;
- To develop smart, upgraded and fully interconnected **transport and energy infrastructures** and make full use of ICT;
- To ensure a coordinated implementation of **infrastructure projects, within the EU Core network**, that critically contribute to the effectiveness of the overall EU transport system;
- To focus on the **urban dimension of transport** where much of the congestion and emissions are generated;
- To use regulation, building performance standards and market-based instruments such as taxation, subsidies and procurement to reduce energy and resource use and use structural funds to invest in **energy efficiency in public buildings and in more efficient recycling**;

Source: COM(2010)2020

Box 0.3 EU 2020 Flagship Initiative “Innovative Union”

The aim of this is to re-focus R&D and innovation policy on the challenges facing our society, such as climate change, energy and resource efficiency, health and demographic change. Every link should be strengthened in the innovation chain, from 'blue sky' research to commercialisation.

At EU level, the Commission will work:

- To complete the **European Research Area**, to develop a strategic research agenda focused on challenges such as energy security, transport, climate change and resource efficiency, health and ageing, environmentally-friendly production methods and land management, and to enhance joint programming with Member States and regions;
- To improve **framework conditions for business to innovate** (i.e. create the single EU Patent and a specialised Patent Court, modernise the framework of copyright and trademarks, improve access of SMEs to Intellectual Property Protection, speed up setting of interoperable standards; improve access to capital and make full use of demand side policies, e.g. through public procurement and smart regulation);
- To launch **'European Innovation Partnerships'** between the EU and national levels to speed up the development and deployment of the technologies needed to meet the challenges identified. The first will include: 'building the bio-economy by 2020', 'the key enabling technologies to shape Europe's industrial future' and 'technologies to allow older people to live independently and be active in society';
- To strengthen and further develop the role of **EU instruments to support innovation** (e.g. structural funds, rural development funds, R&D framework programme, CIP, SET plan), including through closer work with the EIB and streamline administrative procedures to facilitate access to funding, particularly for SMEs and to bring in innovative incentive mechanisms linked to the carbon market, namely for fast-movers;
- To promote **knowledge partnerships and strengthen links between education, business, research and innovation**, including through the EIT, and to promote entrepreneurship by supporting Young Innovative Companies.

At national level, Member States will need:

- To **reform national (and regional) R&D and innovation systems** to foster excellence and smart specialisation, reinforce cooperation between universities, research and business, implement joint programming and enhance cross-border co-operation in areas with EU value added and adjust national

funding procedures accordingly, to ensure the diffusion of technology across the EU territory;

– To ensure a **sufficient supply of science, maths and engineering graduates** and to focus school curricula on creativity, innovation, and entrepreneurship;

– To **prioritise knowledge expenditure**, including by using tax incentives and other financial instruments to promote greater private R&D investments.

Source: COM(2010)2020

1.3 Underlying policy challenges for Sustainable Industrial Competitiveness Policy

The previous subsection provided an overview of a few of the challenges for industry arising from technology and globalisation, and the implications that these may have for patterns of international competition and competitiveness. Placing these illustrations in a broader context, a number of underlying themes that should be addressed by a 'modern' industrial policy may be identified.

Increasing complexity and internationalisation of industry linkages

The fragmentation of production processes and value chains, the increasing importance of intangible factors as drivers of competitiveness, and the need to access more comprehensive and complex sets of production inputs are all factors contributing to the increasing complexity of industrial inter-linkages – including not only manufacturing-type activities but also service functions. This has a wide range of implications in terms of issues to be addressed in formulating and implementing a sustainable industrial competitiveness policy:

Increasing complexity calls for a finer resolution of industrial analysis…

- The need for a *finer level of resolution than traditional classifications of industrial and service sectors*, which permits to look inside traditional notions of industrial sectors and to understand the drivers of competitiveness and their implications for different industrial activities. At the same time, this should also support the development of a more holistic picture that takes account of the wide ranging inter-linkages that influence industry performance and competitiveness. Essentially, the increasing complexity of industrial value chains calls into question the continued use of traditional classifications of industrial (and service) sectors as an appropriate basis for analysis of developments in industrial activities, production processes and value chains.

The diversity of competences determining competitive advantages calls for strengthening industrial linkages beyond traditional sector boundaries

- Following from the previous point, *the increasing range and complexity of competences* underlying the creation of competitive advantages within industry suggests the need to strengthen industrial inter-linkage that reach beyond traditional industrial sector categories and geographical boundaries. This should cover not only 'classical' production factors (e.g. labour, physical capital, raw materials and intermediate goods) and knowledge-based inputs (e.g. research and technology development) but also the full range of supporting production activities and services that can provide additional competences or 'know-how' from which competitive advantages may be derived.

Increased inter-linkages of industrial activities may reduce possibilities to implement 'sector-based' policies and their effectiveness

- The feasibility of designing and implementing 'sector-based' policy approaches, at least where these are based on traditional notions of industrial sectors, may be brought into question by the increasingly complex inter-linkages of industrial production and service activities. The complexity of inter-linkages between industrial sectors increases the risk that policies directed towards one sector may have *unforeseen or perverse effects* in other sectors, where such linkages are not fully understood. Overall, increased complexity suggests that the outcomes of sector-specific policy measures become less predictable.

Effective policy measures may require more targeted policies than is offered by sector-based approaches

Following from the last point made above, it is perhaps time to *draw a line through the normally used distinction between horizontal and sector-based (or sectoral) policy approaches*[13]. In particular, there is a strong basis for arguing that observing traditional sector categories no longer provide an appropriate basis for designing policy when value-chains are increasingly fragmented both within and across sectors, and across geographical locations. On the contrary, effective policies may well need to be directed towards specific activities or 'links' within value chains, or towards strengthening linkages and creating synergies between the elements making-up value chains (e.g. 'cluster-based' approaches) or towards specific types of actors (e.g. based on the size and maturity of firms). In other words, policies may need more specific targeting is implied by current sector-based approaches.

A Sustainable Industrial Competitiveness Policy should recognise the need to evaluate and integrate measures across the broad spectrum of 'generic' policies that impact on industry

As a counterpart to targeted policy approaches, it may equally be a moment to consider reformulating the concept of 'horizontal' industrial policy. In particular, there exists a high degree of ambiguity surrounding the scope of industrial policy measure and the distinction between 'horizontal' and 'framework' aspects policy. Overall, the boundaries between 'framework' and 'horizontal' policy measures can often seem rather fluid, which simply creates confusion over 'what is' and 'what is not' industrial policy. In this respect, it may increase policy transparency if, on the one hand, policy measures are recognised by their generic terms (e.g. competition policy, trade policy, research and innovations policy, etc.), while it is accepted that a sustainable industrial competitiveness policy necessitates a 'holistic' approach that recognises the need to evaluate and integrate measures across the broad spectrum of policies that impact on industry.

Increasing uncertainty and unpredictability of changes in relative competitiveness

The issue of increasing uncertainty and unpredictability is a recurring theme when it comes to examining developments in relative (international) competitiveness. Overall, greater unpredictability combined with a faster speed of change means a more difficult and complicated environment for businesses – and policy-makers – to formulate strategies for developing and maintaining competitiveness. Again, this has wide ranging implication in terms of issues to be addressed in formulating and implementing a sustainable industrial competitiveness policy:

Increased uncertainty and unpredictability places a premium on efforts to anticipate changes in international competition and competitiveness

- An increasing premium is placed on *anticipating* future developments in order to be able for industries to be able to adapt accordingly. In this respect, it seems that (industrial) policy should increase the emphasis placed on anticipation of potential future developments – be they derived from technological or other factors – and the nature of their possible impacts on international competitiveness. For example, perhaps one lesson to be retained is that it is unwise to pursue 'technology for the sake of technology' policies without giving sufficient consideration not only to the competitive advantages that technologies may bestow – including institutional factors such as intellectual property rights enabling these advantages to be retained – but also to existing competitive advantages that they may destroy. In this respect, policies to position the EU as a technologically-sophisticated and knowledge-based economy arguably need to look beyond the immediate short-run gains from technology and

[13] See Section 1.3 for more discussion of 'horizontal' and 'sectoral' industrial policy.

innovation and integrate assessments of the implications for future trajectories of industrial competitiveness.

Policy frameworks need to support industry to react rapidly and implement transformation strategies …

… but this may require horizontal rather than sector specific policies

- The speed with which industries are able to respond to sudden changes in competition and drivers of competitiveness is likely to become increasingly important. This implies that policy frameworks need to support the *flexibility* of industry to react rapid to sudden changes and to facilitate their implementation of transformation strategies. At the same time, admission of the unpredictable nature of factors that may influence industrial competitiveness and uncertainty about the activities that may be affected, imply that it will be difficult for policy frameworks to target specific vulnerable sectors or activities in advance. This suggests the need for increased attention to general policies to support industrial transformation, rather than selective measures targeted towards specific industry sectors.

Stability and transparency of regulatory conditions supports long-term business planning, thus promoting competitiveness and industrial transformation

- In an environment characterised by rapid, sudden and unpredictable changes in business conditions and competition, enterprises still need to develop a long-term view as the basis for business planning and investment decisions. In this respect, *stability – or at least predictability – and transparency of regulatory conditions* are important. Frequent changes in regulatory conditions exacerbate problems of uncertainty and unpredictability, which can delay decisions that may have important implications for competitiveness and slow down processes of industrial transformation.

Industrial policy governance in a globalised world

As was noted in the introduction to this chapter, the economic and financial crisis highlighted the need for multi-level governance approaches to economic (and industrial) policy. More generally, we can observe increasing policy 'spill-over' effects – both positive and negative – across regions and countries, across sectors and business activities, and across policy areas. While the EU has important responsibilities in some key areas of policy that affect industry (e.g. trade, competition, internal market), many of the policy areas that can impact most directly on the broad business environment for industry are determined at the level of Member States or even at sub-national (i.e. regional or local) levels. At the same time, many of the challenges faced by industry – and, in turn, by policy-makers – are defined at an even higher international level. For example, addressing environmental and energy issues, and access to raw materials and international markets necessitate fostering agreements and policy actions at a supra-EU (or global) level. This raises a central issue for the development of an EU-wide Sustainable Industrial Competitiveness Policy of how to effectively and efficiently ensure coherence, coordination and integration of policy approaches across different policy domains and governance levels:

A need for multi-dimensional policy governance frameworks

- The increasing geographical complexity of industry value chains, the integration of markets, and the global nature of many of the most pressing policy challenges for industry argue for establishing *multi-dimensional policy governance frameworks* (i.e. multi-level and multi-policy).

1.4 Towards an outline framework for Sustainable Industrial Competitiveness Policy

The preceding sections have attempted to raise some of the broader issues that arguably need to be addressed by an EU Sustainable Industrial Competitiveness Policy. Drawing on these, and on some of the general features of current EU industrial policy and some of the associated key concepts (see Annex) this section aims to provide a general framework for describing and analysing Sustainable Industrial Competitiveness Policy.

1.4.1 Industrial competitiveness and transformation

Determinants of industrial competitiveness

As a starting point, the competitiveness of firms, sectors and industry as whole depends both upon 'internal' conditions within industry itself and on the broad 'external' framework conditions for industry. Thus, we can distinguish two dimensions of industrial competitiveness:

Internal dynamics within industrial sectors remain important….

- ***Within industry determinants*** that relate to the situation and internal dynamics within industrial sectors. A number of key elements can be identified:
  - *Firm strategies and business models*, covering the different strategies followed by companies (e.g. cost-based, innovation-driven, branding & marketing);
  - *Input factor utilisation*, covering the utilisation of production factors within the sector (e.g. labour, capital, intermediate goods and services, and knowledge and technology);
  - *Production process and product development*, covering the management and organisation of production processes within the sector including, for example, technology utilisation, but also encompassing product and service development and innovation;
  - *Industry structure and organisation*, covering the overall structure of the sector in terms of, for example, enterprise composition (size), specialisation and segmentation, economies of scale and scope, company formation and closure, etc.;
  - *Supply and value chain relationships*, covering the upstream (backward) and downstream (forward) linkages between industry (and other) sectors and markets.

… but so are the conditions that shape the general context in which firms operate

- ***Framework condition determinants*** that are concerned with the regulatory environment and other framework conditions that are 'within the reach of policy' and that shape the general context in which firms operate. Essentially this covers aspects of the business and operational environment that are external to individual (and collective) business operations of firms within the sector:
  - *Regulatory and institutional conditions:* this covers the regulatory and institutional conditions that apply to the sector itself, or that influence inputs and resources into production (i.e. industry conditions), or markets and demand for the sectors outputs (i.e. market conditions). In terms of policy measures, these include aspects such as labour market regulations, competition policy, protection of intellectual property rights, industry standards, energy and environment legislation, etc.

- *Other framework conditions:* this covers a broader range of conditions shaping the business environment but that may be influenced directly or indirectly by (mainly non-regulatory) policy measures. Again we can distinguish between 'supply-side' conditions – particularly in relation to factor inputs such as labour force and skills, physical infrastructure, knowledge development and diffusion, access to finance, etc. – and 'demand-side' conditions in markets for the sectors products and services (e.g. changing consumer preferences, consumer policies, etc.)

Industrial transformation pressures and processes[14]

Beyond the 'internal' conditions and broad 'external' framework conditions outlined above, European industry – and European society in general – is confronted by a wide range of fundamental challenges that influence competition and competitive conditions. These challenges – which are often interrelated – include overarching 'issues' such as globalisation and international competition, climate change and environment, demographic change and migration, technological change, geopolitical tensions and security, and – as recent events have demonstrated – vulnerability to economic shocks and crises. Clearly the capability of industry to effectively respond to these challenges is closely linked to its competitiveness and the various determinants of competitiveness outlined above. At the same time, responding to these challenges can lead to adaptations in the ways by which industry contribute to economic, social and environmental outcomes and objectives and, in turn, to the overall composition of economic activities.

The capability of industry to respond to external challenges will be decisive..

Accordingly, in parallel to creating the right conditions for industrial competitiveness, industrial policy also plays a role in facilitating the adaptation of industry to changing economic, social and environmental conditions. On the one hand, this may encompass relatively 'neutral' policy measures aimed at creating benign framework conditions for enterprise development and competitiveness. On the other, it may also encompass more 'positive' policy measures aimed at influencing and promoting the transformation development of industry in specific directions (e.g. in accordance with sustainable development objectives).

Transformation can be observed at various levels…

At this point, it is perhaps worth recalling that processes of industrial transformation can be observed at a variety of different levels[15]. To start, they may involve broad changes 'macro sector level' changes, notably the processes of '*tertiarisation*' (i.e. rising share of services in economic activity) and so-called '*quarternarisation*' associated with the rise of information and knowledge-based services. Below this, transformation can occur at a 'sector level' (e.g. changes in the distribution of economic activity across industrial

[14] We use the description of industrial transformation rather than structural adjustment. This choice has been made because the role of industrial policy in supporting (structural) adjustment is typically associated with measures directed towards mitigating the adverse social consequence associated with industrial decline. This tends to neglect the fact that industry needs to continually adapt – and not necessarily in negative ways – in response to changing economic, market, technological, social and other conditions. For example, the whole notion of moving towards more sustainable and 'greener' production processes and production outputs implies significant adaptation by industry, the outcome of which it is hoped will be far from negative. Accordingly, for the purposes of this paper, industrial transformation refers not so much to mitigating measures to alleviate the negative impacts of industrial decline but, rather, relates to measures to facilitate the adaptation of industry while contributing to achieving (and maintaining) the competitiveness of industry in accordance with sustainable development objectives.

[15] See Section 1.6 for a more detailed description.

sectors) or 'within sectors' (e.g. changes in market shares of firms, labour or product segmentation within a single industry). Finally, transformation may occur 'within firms', which is a phenomenon closely associated to the fragmentation of production processes (also referred to as vertical specialisation and slicing up the value chain). The main feature of transformation within firms is changes in the composition of the portfolio of activities that they undertake (e.g. focussing on those activities that enable them to develop competitive advantages whilst, at the same time reducing other activities or having them contracted-out to specialist providers).

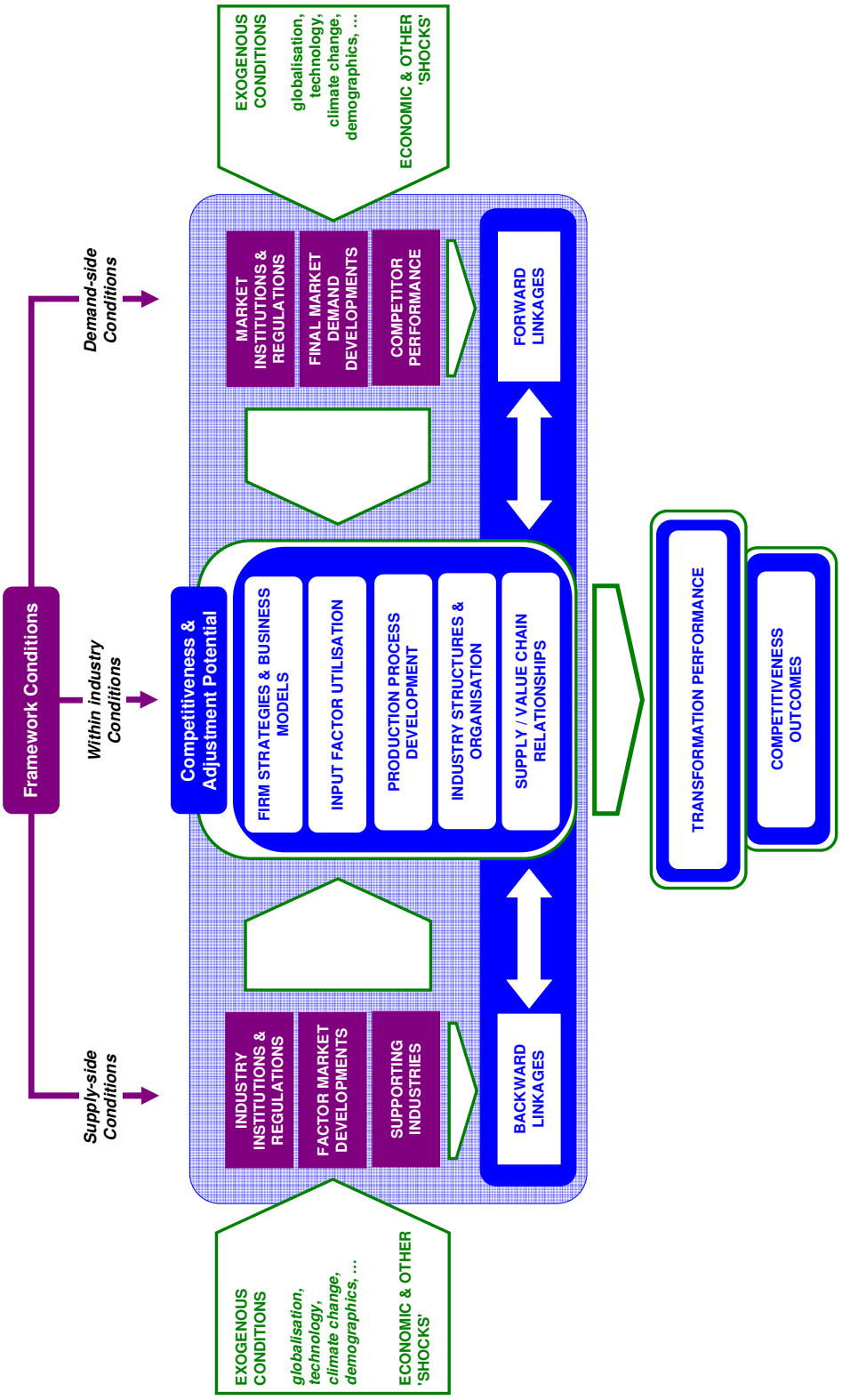
Industrial policy can influence the channels through which external transformation pressures are translated into pressure on specific industry sectors…

It is also worthwhile to recall that pressures for industrial transformation can operate through a wide range of channels. Although (EU) public policy may have some (marginal) influence on fundamental processes such as globalisation, climate change or technological transformation, by and large such processes are outside the domain of EU public policy, and specifically outside the domain of EU industrial policy. While the underlying causes of transformation pressures may be considered as exogenous, industrial policy can influence the channels through which transformation pressure in general are translated into pressure on specific industry sectors. Overall, these channels may include supply-side characteristics such as industry institutions and regulations, factor (input) market developments, and supporting and related industries/services. While on the demand-side, this could include market institutions and regulations, and developments in downstream/final markets. Also, of obvious relevance, is the behaviour and performance of (international) competitors.

Industrial competitiveness and transformation framework

Bringing together the various elements described above, Figure 1.1 provides a stylised representation and categorisation of the main factors influencing and determining industrial competitiveness and transformation performance.

Figure 1.1 Sustainable Industrial Competitiveness framework



1.4.2 Elements of Sustainable Industrial Competitiveness Policy

Categorisation of (sustainable) industrial policy measures

Three broad categories of policy measures can be distinguished

Drawing on the various elements discussed in the Annex [16], three broad categories of policy measures are identified that fall within the heading of Sustainable Industrial Competitiveness Policy:

- ***Market functioning and scope***: covering policy measures – typically of a regulatory nature – that are primarily directed towards securing fair and open markets, such as competition policy, trade policy, internal market policy, consumer/market policy. In general, such policy measures tend to impact more heavily on demand side conditions affecting industry.
- ***Business environment and inputs***: covering policy measures of a typically cross-cutting nature that support the competitiveness and transformation potential of industry by enhancing capacities and capabilities within the business environment. These may include, for example, improving the quality, availability and access to factor inputs and improvements in the general business administrative environment. Essentially, such measures would cover non-regulatory 'framework' measures. In general, such policy measures tend to impact more heavily on supply side conditions affecting industry.
- ***Industrial performance and transformation***: covering policy measures that also aim enhance the competitiveness and transformation potential of industry, but are more directly targeted towards enhancing conditions within industry (including specific sectors or industry value-chains) as opposed to surrounding framework conditions.

Coherence, coordination, and integration – towards multi-level governance

Coordination between various horizontal policies is vital…

The above categories of industrial policy measures are set within the broad policy framework and objectives for economic, social and environmental development[17]. At this level, it is clear that there exists a wide range of industrial policy measures that are not necessarily intended to meet sustainable industrial competitiveness policy objectives but, nonetheless, impact upon industry. Accordingly, the overall scope of industrial policy can be extended to include the evaluation of coherence between industrial and non-industrial measures and their overall coordination and integration within the context of the broad policy framework.

… and so is coordination between various governance levels…

The aspect of 'coherence, coordination, and integration' is not only relevant to policies and policy measures taken at an EU-level, but also extends to possible inter-relationships between EU-level and national (Member State) level initiatives and, where relevant, even at a broader – extra-EU or supra-national (global) – international level. In particular, as noted in Section 1.3, responsibility for setting and implementing policy in many of the areas relevant for industrial policy rests with Member States; this is particularly the case for policy measures falling under the headings of '*business environment and inputs*' and '*industrial performance and transformation*', as described above. In relation to this, the EU has an important role to play in ensuring that policy measures taken by and within

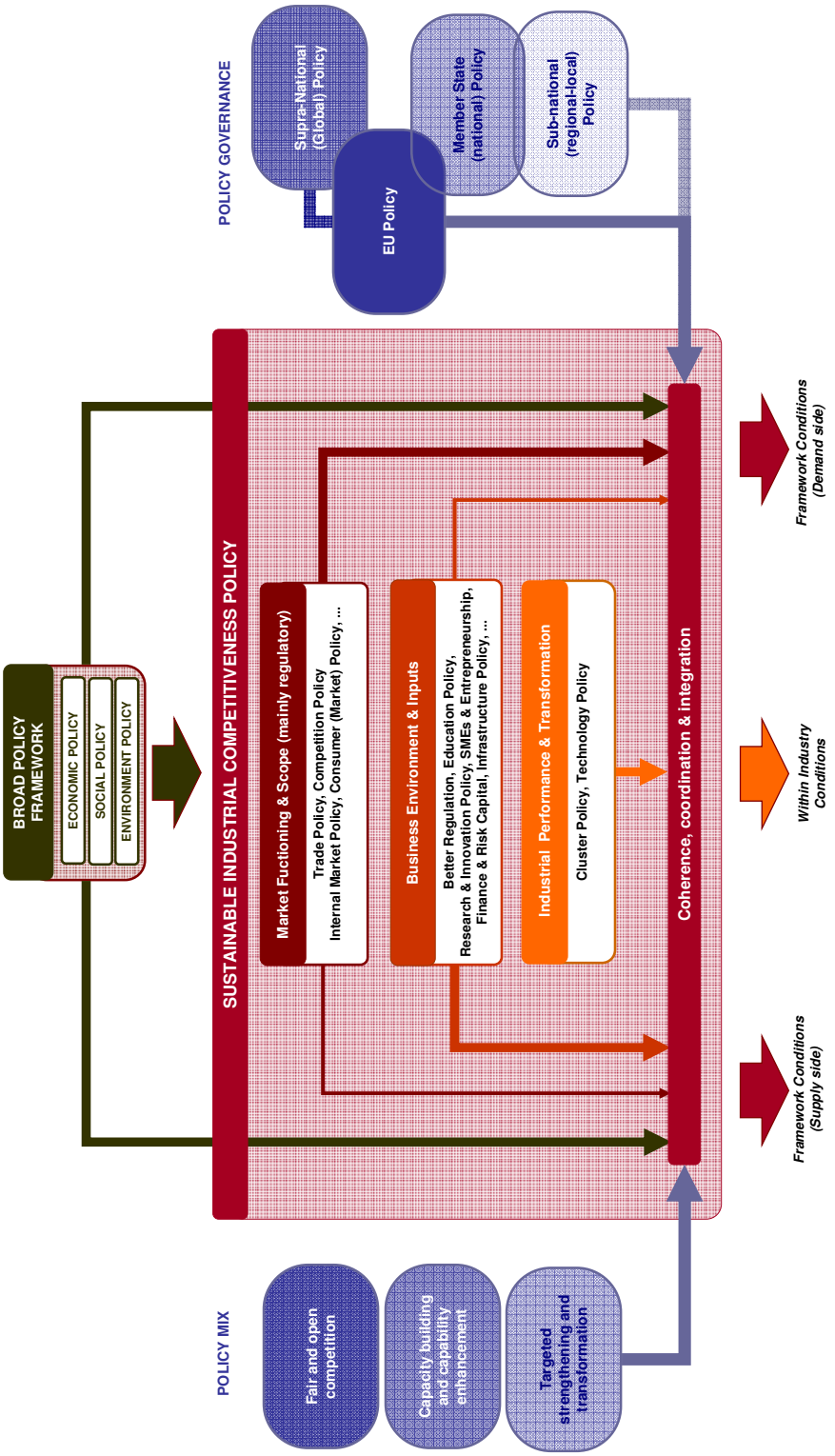
[16] Specifically Section 1.3
[17] See Section 1.7

Member States do not impinge on the integrity of the Internal Market. Furthermore, the increasing complexity of inter-relationships between industrial sectors (i.e. value/supply chain relationships) and across geographical locations, suggests that attention should also be paid to the implications of inter-sectoral – and, even intra-sectoral – dynamics of policy initiatives and potential 'spill-over' effects both across sectors and across geographical boundaries. In this respect, processes of globalisation and the global dimension of many challenges facing EU industry, imply that EU cannot act in isolation and that certain dimensions of a sustainable industrial competitiveness policy, require approaches and solutions defined at a broader international (global) level.

Towards a Sustainable Industrial Competitiveness Framework

Bringing together the various elements described above, Figure 1.2 provides a stylised representation and categorisation of the main elements of a sustainable industrial competitiveness policy.

Figure 1.2 Sustainable Industrial Competitiveness Policy Framework



1.5 Key conclusions

Drawing on the preceding discussions, we can point to a number of key conclusions relevant for the development of an EU Sustainable Industrial Competitiveness Policy.

Context and background

1. In putting forward the Commission's proposals for the EU2020 Strategy, the recent events of the economic and financial are portrayed as a "*wake up call*" for the EU, while the EU is presented as being at a "moment of transformation". Beyond seeking to instil a sense of urgency for the development of policies necessary "to deliver smart, sustainable and inclusive growth", the Strategy indicates that required actions – both by policy makers, the private sector and citizens – go beyond incremental adjustments and tinkering with conventional practices.

2. In view of the forthcoming Commission Communication on industrial policy, it is an opportune moment to evaluate whether the current EU-level approach to industrial policy and the approaches pursued at national and sub-national levels by Member States are both adequately aligned and sufficient to meet current and future challenges. It is also a moment to take a 'step back' from the immediate concerns of the economic and financial crisis, in order to identify some of the key issues that will need to be addressed by a '*modern*' industrial policy.

3. It seems inevitable that the articulation between sustainable development and industrial competitiveness will be among the central themes – and most likely the main overarching theme – for future industrial policy. A future '*sustainable industrial competitiveness policy*' will need to facilitate the adaptation and transformation of industry while contributing to achieving (and maintaining) the competitiveness of industry in accordance with sustainable development objectives.

4. The ability of emerging economies to position themselves as major competitors in so-called 'high-tech' sectors has demonstrated that the intrinsic technological level of a sector is not a shield against competition. In fact, the external competitiveness of EU industry has less to do with its relative position in sectors with different technology categorisations (i.e. low-, medium- or high-tech) and more to do with capabilities of EU enterprises across a range of sectors to *successfully apply technologies in innovate ways or to adapt technologies to specific market requirements* (i.e. product differentiation and specialisation).

5. Transformation processes linked to technology developments do not only involve high-tech manufacturing sectors but also involve *innovative applications of technology* in lower-tech sectors. Competitiveness may be more greatly enhanced by strategies (e.g. smart specialisation) that build upon existing assets (e.g. skills and expertise, available physical inputs, environmental conditions, market access conditions, etc) than jumping upon current technology 'bandwagons'.

6. While tangible factors provide the bedrock for (external) competitiveness, increasingly the factors that underpin the ability of firms to differentiate themselves from their competitors are *intangible*. Factors such as quality, branding,

customisation and provision of product-related services, can also be identified as crucial for enabling EU industries to innovate and to position themselves in 'up-market' and 'high value-added' product segments.

7. *Industrial sectors can no longer be treated as homogeneous, independent and national*. Value chains are increasingly complex and intertwined, cutting across traditional sector-based categories and geographical boundaries. This fact points to the increasing importance of networks of suppliers and innovation partners, of maintaining a diversified industrial base, and of access to specialised supporting competences.

8. As emerging economies, such as China, India or Brazil, increase their own technological capabilities, it may become far from evident to identify those industrial activities and market segments where they will become important competitors in the future. Moreover, as other 'advanced' economies struggle with low domestic growth and increased competition from emerging economies the pressure of competition in international markets, in particular in those 'up-market' and 'high value-added' product segments where EU industry is present, can be expected to increase. Accordingly, *the possibility of unforeseen and sudden shifts* in relative competitiveness may increase in the future.

Implications for industrial policy

9. *Industrial policy requires a finer level of resolution* than offered by traditional classifications of industrial (and service) sectors, which permits to look inside traditional notions of industrial sectors and to understand the drivers of competitiveness and their implications for different industrial activities. At the same time, a more holistic picture is needed that takes account of the wide ranging inter-linkages that influence industry performance and competitiveness, and accommodates the evaluation and integration of measures across the broad spectrum of policies that impact on industry.

10. It is perhaps time to draw a line through the normally used distinction between horizontal and sector-based (or sectoral) policy approaches. In designing and implementing Sustainable Industrial Competitiveness Policies, *attention should rather be paid to combining generic policies with targeted policies*, directed towards specific categories of firms or elements within value chains, or towards strengthening linkages and creating synergies within value chains (e.g. focusing on young, innovative companies or cluster-based policies).

11. Greater unpredictability combined with a faster speed of change means a more difficult and complicated environment for businesses – and policy-makers – to formulate strategies for developing and maintaining competitiveness. A sustainable industrial competitiveness policy should *increase the emphasis placed on anticipation of potential future developments* – be they derived from technological or other factors – and the nature of their possible impacts on international competitiveness.

12. The speed with which industries are able to respond to sudden changes in competition and drivers of competitiveness is likely to become increasingly important. This implies that policy frameworks need to support the *flexibility* of industry to react rapid to sudden changes and to facilitate their implementation of transformation strategies.

13. Frequent changes in regulatory conditions exacerbate problems of uncertainty and unpredictability, which can delay decisions that may have important implications for competitiveness and slow down processes of industrial transformation. *Stability – or at least predictability – and transparency of regulatory conditions are important* for enterprises to develop a long-term view as the basis for business planning and investment decisions.

14. The increasing geographical complexity of industry value chains, the integration of markets, and the global nature of many of the most pressing policy challenges for industry can be observe in increasing policy 'spill-over' effects – both positive and negative – across regions and countries, across sectors and business activities, and across policy areas. This raises a central issue of how to effectively and efficiently ensure coherence, coordination and integration of policy approaches across different policy domains and governance levels and argues for establishing *multi-dimensional policy governance frameworks for an EU-wide Sustainable Industrial Competitiveness Policy*.

Annex: EU industrial policy: background, underlying issues and key concepts

1.1 Introduction

The aims and objectives of industrial policy, the range and types of policy measures covered, and the scope of application of possible measures can be viewed from a wide range of historical, developmental, institutional and intellectual perspectives. Moreover, a variety of titles have been variously used to describe 'industrial policy' such as: industrial competitiveness policy, industrial development policy, sustainable industrial policy, enterprise policy, etc. the differences between which often appear rather ambiguous. Not surprisingly, therefore, a precise definition of industrial policy is somewhat elusive. In this section, therefore, we shall attempt to provide a general description of industrial policy, and identify and define some of the key issues surrounding current approaches to industrial policy development.

1.2 'Old' versus 'new' industrial policy[18]

What may be termed '*old*' industrial policy – at least within the timeframe of the EU (and previously the European Community) – is usually associated with direct and sector-specific interventions aimed, on the one hand, at encouraging the development of specific sectors identified as offering opportunities for growth and employment and, on the other hand, by efforts both at national and Community-level to prevent the decline of sectors considered to be of strategic importance for a variety of industrial, social or security-related reasons. Reflecting a combination of poor actual policy outcomes, changing economic orthodoxy, and geopolitical transformation, by the 1990s – if not already earlier – the kinds of policies associated with attempts at '*picking winners*' and '*bailing out losers*' had become largely discredited[19].

Since the 1990's there has been a general shift in the emphasis of industrial policy away from sector specific interventions and towards non-sector-specific policy measures. What may be referred to as '*new*' industrial policy – in particular within the EU context – has been characterised by a focus on creating the right broad environment for industrial development based on actions of a cross-sectoral (i.e. non sector specific) nature. This approach was integrated into the Maastricht Treaty in 1992, which provided the first legal reference to EU industrial policy. Under Article 130 of the Treaty (now Article 173 of the Lisbon Treaty; see Box 1.1), the EU and Member States are

[18] For a more detailed analysis of the changing concept of industrial policy see, for example: Bianchi P. and Labory S. (2006), "From 'old' industrial policy to 'new' industrial development policies" and Pelkmans J. (2006) "European Industrial Policy", both in Bianchi P. and Labory S. (ed.) *"International handbook on industrial policy"*, Edward Elgar.

[19] Nonetheless, even today there remains something of a 'hangover' in terms of the association of industrial policy with these types of intervention. At least, DG Enterprise appears to find it necessary to explicitly exclude such types of policy interventions from the scope of current EU industrial (competitiveness) policy; see Box 1.3.

required to ensure the conditions necessary for the competitiveness of the Union's industry and for this purpose should undertake actions aimed at:

- Facilitating (speeding up) adjustment to structural changes;
- Encouraging an environment favourable to business initiative and development;
- Encouraging an environment favourable to business cooperation;
- Fostering better industrial exploitation of innovation, research and technological development.

Box 1.1 Lisbon Treaty: Article 173: Industry

1. The Union and the Member States shall ensure that the conditions necessary for the competitiveness of the Union's industry exist.

   For that purpose, in accordance with a system of open and competitive markets, their action shall be aimed at:

   – speeding up the adjustment of industry to structural changes,
   – encouraging an environment favourable to initiative and to the development of undertakings throughout the Union, particularly small and medium-sized undertakings,
   – encouraging an environment favourable to cooperation between undertakings,
   – fostering better exploitation of the industrial potential of policies of innovation, research and technological development.

2. The Member States shall consult each other in liaison with the Commission and, where necessary, shall coordinate their action. The Commission may take any useful initiative to promote such coordination, in particular initiatives aiming at the establishment of guidelines and indicators, the organisation of exchange of best practice, and the preparation of the necessary elements for periodic monitoring and evaluation. The European Parliament shall be kept fully informed.

3. The Union shall contribute to the achievement of the objectives set out in paragraph 1 through the policies and activities it pursues under other provisions of the Treaties. The European Parliament and the Council, acting in accordance with the ordinary legislative procedure and after consulting the Economic and Social Committee, may decide on specific measures in support of action taken in the Member States to achieve the objectives set out in paragraph 1, excluding any harmonisation of the laws and regulations of the Member States.

The role attributed to industrial policy in the Maastricht Treaty – namely as a tool to be used to promote competitiveness – and the attention given to the four listed action areas have remained at the core of EU-level industrial policy developments through the 1990s and over the last decade, subject to certain changes in emphasis along the way[20]. At the same time, although a cross-sectoral or *horizontal approach* has been an underlying principle of EU industrial policy since Maastricht, this does not imply an absence of a sectoral dimension (*sector-based approach*). In particular, when putting forward its strategy for industrial (competitiveness) policy to accompany the re-launched Lisbon Agenda in 2005, the EC stressed the need for effective industrial policy to combine both horizontal and sector-based aspects (i.e. so-called *integrated approach*). Specifically, the Commission stated that:

> "The Commission is committed to the horizontal nature of industrial policy and to avoid a return to selective interventionist policies. Nevertheless, the scope of policy instruments should not be seen just as only very broad horizontal measures. For industrial policy to be effective, account needs to be taken of the specific context of individual sectors. Policies need to be combined in a tailor-made manner on the basis of the

[20] One change that came about with the Maastricht Treaty was a partial shift in emphasis of EU industrial policy away from a prioritisation of facilitating structural adjustment to a prioritisation on enhancing competitiveness. This distinction may seem rather semantic but it points to the fact that enhancing competitiveness is perhaps best viewed as facilitating structural adjustment rather than vice versa. We can see, also, that whereas the original Lisbon Agenda set ambitions for the EU to become the most competitive region in the world (however that may be defined), the re-launched 2005 Agenda focused – arguably more pertinently and more realistically – on enhancing competitiveness in order to stimulate growth and employment. (See Box 1.2)

concrete characteristics of sectors and the particular opportunities and challenges that they face. This inevitably has as a consequence that whilst all policies are important, in the EU today some policies have greater importance for some sectors than others."[21]

1.3 The scope of EU industrial policy

Broadly speaking, we can say that EU industrial policy is primarily concerned with public policy measures that influence the environment – or in EC parlance the '*framework conditions*' – in which firms (and individuals) engage in wealth creating economic activities. In turn, industrial policy initiatives that seek to affect this environment should do so in a way that is supportive to enhancing the competitiveness of (EU) industry. This is, at least, the primary role that the EC ascribes to (EU) industrial policy (see Box 1.2 and Box 1.3). The basic presumption underlying this approach to industrial policy is that the 'right' framework conditions will impact positively on the competitiveness of enterprises and hence their development, while the 'wrong' framework conditions will have the opposite effect.

An obvious issue arising from the above description of the role of industrial policy is the identification of the 'framework conditions' for enterprise development that are relevant for industrial policy perspective. For example, the effective functioning of competition law in order to ensure 'open markets' and 'fair competition' is arguably a fundamental requirement for a market-based economy to provide an environment in which industry can thrive. Similar arguments could be made in a whole range of policy areas, such as trade, employment, education, and even at a higher macroeconomic level (e.g. broad economic and social policy) that have the potential to affect the environment in which businesses engage in their activities.

Box 1.2 The role of EU industrial policy

Role of industrial policy

"The basic premise underlying the European Union's industrial policy is to follow a dynamic horizontal approach smoothing the way for the implementation of a consistent package of policies to help make industry more competitive"

Source: COM (1994) 319

"Industrial policy … aims at securing framework conditions favourable to industrial competitiveness. Its instruments, which are those of enterprise policy, aim to provide the framework conditions in which entrepreneurs and business can take initiatives, exploit their ideas and build on their opportunities."

Source: COM (2002) 714

"The main role of industrial policy is to provide the right framework conditions for enterprise development and innovation in order to make the EU an attractive place for industrial investment and job creation."

Source: COM(2005) 474

"The main role of industrial policy at EU level is to proactively provide the right framework conditions for enterprise development and innovation in order to make the EU an attractive place for industrial investment and

[21] Source: COM (2005) 474

job creation, taking account of the fact that most businesses are small and medium-sized enterprises (SMEs)."

Source: COM (2007) 374

Box 1.3 DG Enterprise description of the role of EU industrial competitiveness policy

Role of EU industrial competitiveness policy

EU industrial competitiveness policy is about getting the right environment for industry to thrive.
It is about:

- stimulating innovation and competition and investment in know how;
- guaranteeing a level playing field in the Single Market and outside of it in third countries;
- reducing frictions and transaction cost in the European economy, such as administrative burden.

Where appropriate, it facilitates the adjustment process of declining industries or industries exposed to socially unacceptably high adjustment pressure.

It is also important to be clear what EU industrial competitiveness policy is NOT:

- It is not about ad-hoc intervention, picking winners or bailing out losers, or similar concepts.
- It is not about more regulation or more state aid.

Instead it is about less but better regulation and about less but better focussed state aid, etc.

In 2005, the Commission set out for the first time a so-called integrated approach of industrial competitiveness policy based on a combination of cross-sectoral (horizontal) and sector-specific initiatives.

The mid-term review in 2007 restates the position that the main role of industrial policy in the EU is to provide the right framework conditions for enterprises and to make the EU an attractive place for industrial development and job creation.

Source: DG Enterprise website

Unfortunately, there is no clear answer to the question of what policy areas, and corresponding policy instruments, fall within the scope of industrial policy and which do not. On the one hand, a broad (comprehensive) interpretation of industrial policy can be made that would subsume instruments and measures from across a wide range of policy fields within the scope of industrial policy. Thus a broadly defined industrial policy can be viewed as an amalgam of overlapping policy areas rather than a distinct and bounded policy field. A recent example of this approach can be seen in the European Council Conclusions on the need for a new industrial policy, which highlighted *inter alia* the priority for industrial policy to:

> "… contribute to responding to the opportunities and challenges of globalisation by combining all possible instruments and measures of EU industrial policy (including for example those of the internal market, competition, skills and regional policy, trade and investment, standards and regulatory convergence)"[22]

On the other hand, we can also observe a somewhat narrower (restrictive) definition of the scope of industrial policy which is more closely aligned to institutional competences and mandates, specifically those of the relevant administration(s) responsible for policies directed specifically 'towards industry' (i.e. DG Enterprise and Industry). In this situation, industrial policy takes on

[22] "Council conclusions on the need for a new industrial policy", 2999th Competitiveness Council meeting Brussels, 1 March 2010, 6391/10

more of a 'residual' character, in the sense that the term is used to refer to those policy areas and corresponding measures and instruments that fall outside the responsibility of 'non-industry' administrations.

To some extent the dichotomy between a comprehensive and more restricted description of industrial policy is treated within the EU context through the association of a 'competitiveness' principle with policy initiatives that potentially cut across administrative responsibilities. This is evident, for example, if we look at the description of kinds of horizontal measures taken in support of the re-launched Lisbon Agenda and promoted under the heading of 'industrial policy'[23]. On the one hand, we find specific initiatives that seem to fall more obviously within a relatively restrictive scope of industrial policy; for example in the areas such as: IPR and counterfeiting, legislative and regulatory simplification, improving sectoral skills, industrial research and innovation, etc. On the other hand, broader themed initiatives that cut across policy areas are labelled – or clearly described – with regard to their competitiveness characteristics; for example: 'competitiveness and market access' (trade policy), 'competitiveness, energy and environment' (energy and environmental policies), 'structural adjustment in manufacturing' (regional and cohesion policies (structural funds)), 'access to raw materials' (trade, energy and environmental policies) etc. Essentially, this latter group of initiatives reflects the inclusion of the evaluation of the competitiveness effects of 'other' policies (i.e. a 'competitiveness test') within the scope of industrial policy.

Following from the above, and drawing on Pelkmans (2006)[24] who provides an outline classification of EU industrial policy and other policy measures that affect industry, the following taxonomy may be used to categorise relevant policy measures (see Figure 0.1):

- **Policies not for industry** but that affect industry. These cover:
  - **Broad economic and social policy** such as macroeconomic stability with fiscal and monetary instruments; re-distributional tools; tax policy etc.
  - **Policies for 'non industry' sectors** such as agriculture, energy, services, etc.
- **Policies not only for industry** (i.e. policies which directly help or constrain industry but are *not meant* (only) for industry) such as price controls, buy-national campaigns, tied development aid, or environmental policies addressing specific hazards such as poisonous chemicals.
- **Policies for industry** in a broad sense (i.e. '*wide concept of industrial policy*') that are composed of three main blocks:
  - **Framework aspects** that determine or strongly influence the general environment in which enterprises undertake their business. It is not really possible to provide a precise definition of the scope of framework conditions, but a number of sub-themes/areas – often interrelated and not mutually exclusive –can be discerned:
    - ***Market functioning (competition):*** covering policies – typically regulatory in nature – that govern the '*rules of the game*' under which enterprises compete with each other. Most obviously this would include competition policy but may be extended to include, for example, rules governing the provision of particular services (e.g.

[23] See COM(2005)474 and COM(2007)374

[24] Pelkmans J. (2006) "European Industrial Policy", in Bianchi P. and Labory S. (ed.) *"International handbook on industrial policy"*, Edward Elgar.

network services) and products, state aid provisions, and also may include policies for competitive ('open') public procurement systems.

- ***Market scope and integration:*** covering policies – often regulatory in nature – that shape the potential scope and extent of integration of (international) markets. This would include 'international trade policy' (e.g. external market access) and, specifically in an EU context, 'Internal Market policy' (e.g. policies aimed at deepening and strengthening integration of the Internal Market). It may also include consumer/market policies or product-based policies that influence conditions in final markets for goods (and services) produced by industry.
- ***Business processes and administration:*** covering policies that influence the nature and costs of business processes. This would include, for example business administration requirements, and policies such as 'better regulation' efforts aimed at simplifying and improving the regulatory environment and reducing administrative burden on enterprises. It may also be extended to cover policies that influence specific activities (e.g. research, technology development and innovation) and processes (e.g. environment or energy efficiency requirements for production processes) within enterprises, or that influence interrelationships between enterprises and sectors (e.g. cluster policies, industrial cooperation, etc.).
- ***Business inputs and infrastructure,*** covering policies that influence the availability and quality of inputs used by industry. Most obviously this would include policy related to labour (e.g. education and training policies) but can also be extended to other inputs such as energy or finance. More broadly, it could be extended towards policies directed at enhancing the physical (e.g. built infrastructure) and network (e.g. telecommunications) environment[25].

- **Horizontal industrial policy**, which are typically defined as such because of their cross-cutting nature but we can also see them as complementary policies – mainly non-regulatory in nature – that are aimed at assisting enterprises to improve their performance/competitiveness. At an EU-level these cover a number of themes – often closely interlinked – such as 'knowledge and innovation', 'human capital and skills', 'entrepreneurship and SME development', 'better regulation' etc.;
- **Sectoral industrial policy**, which consist of policies that seek to address sector-specific dimensions of the framework and horizontal aspects described above, or other sector-orientated policies aimed at addressing specific sector-level market failures.

It is important to recognise, however, that within this taxonomy the boundaries between the policy categories – in particular under the heading of 'policies for industry' – are not always well defined; for example boundaries between 'framework' and 'horizontal' policy areas can often seem rather fluid, and supposedly 'horizontal' measures can quite evidently have a very strong sectoral dimension. Nonetheless, this taxonomy also can be used to indicate the main types of interventions to be taken by policy-makers in support of 'industrial policy':

- first, to influence 'other' policies affecting the various framework conditions for enterprises in such a way that their potential positive contribution to industrial competitiveness is maximised

[25] Cohesion policy (or regional policy more generally) may also be included within this category since it primarily operates through measures directed towards improvements in 'soft' (networks and roads/bridges/tunnels) and 'hard' (human capital, technical schools, retraining facilities, administrative capacity) infrastructure.

or, at least, any potential negative effects on the competitiveness of industry are adequately recognised and where possible minimised;

- secondly, to take specific horizontal initiatives to address weaknesses in the framework conditions for industry where these weaknesses are the result of 'market' or 'systemic' failures which might justify public policy intervention;
- thirdly, to take specific sectoral initiatives where framework conditions (and related policy measures) and/or market failures have differential effects – either in terms of the type of effects or their magnitude – across industry sectors that might warrant more targeted (or 'tailor-made') approaches.

By and large the main thrust of EU-level industrial policy over the past two decades has been concerned with the first two types of interventions mentioned above. In some areas, notably trade policy and internal market policy where the EU has primacy over national administrations, the main responsibility for setting (industrial) policy is at the EU level. More generally, responsibilities are shared between the EU and national levels and often, even where the EU has a mandate to set policy guidelines, actual policy implementation – and control of the financial purse strings for funding policy initiatives – is mainly at the national level. This is the case for many of the main areas covered by EU horizontal policy initiatives, which implies that their effective implementation requires cooperation, coordination and coherence between EU and national-level policy making (see Box 1.4).

In terms of sector specific policy initiatives, the EU has made clear its rejection of more interventionist approaches, and the current EU approach to sectoral policies is essentially non-interventionist, consisting largely of 'soft' measures such as consultation processes, high-level working groups, and combined with efforts aimed towards simplification of sector-specific legislation etc. In this regard, while the EU continues to monitor developments at the level of industry sectors and in terms of the overall composition (structure) of industry within the EU, we can see that certain industry sectors have been subject to more attention than others (see Figure 0.2). On the one hand, greater attention has been given to sectors seen as particularly vulnerable to globalisation and other 'structural adjustment' pressures (e.g. shipbuilding, textiles, metals, etc.). On the other hand, sectors considered to be important in terms of their growth potential – particularly high-tech and high value added sectors (e.g. pharmaceuticals, bio-technology, ICT, etc.) – have been the subject of attention; we can see, for example, some alignment of EU policy instruments (such as research funding, 'lead market' initiatives) towards technologies and products linked to these growth sectors.

Box 1.4 The role of EU and Member States for industrial policy

Role of EU and Member States

" … industrial policy is based on a partnership between the EU and Member states. Several industrial policy challenges need to be addressed at the European level, since individual Member states acting in isolation cannot succeed in tackling issues such as major competition cases, the regulation of the single market, or social and economic cohesion. However, Member states also have responsibilities for many elements of industrial policies …"

Source: COM(2005) 474

"An effective and functioning industrial policy in the EU must be based on coherent and coordinated efforts at national and European level … Many elements of major impact for the competitiveness of European industry are set at national level. Nevertheless, important challenges such as the creation of an open and competitive Single Market, but also the industrial policy response to the energy and climate change agenda can not, or only be insufficiently addressed at national level, and hence require action at European level as well."

Source: COM (2007) 374

To strengthen the competitive advantages of its industrial base, Europe needs a solid industrial fabric throughout its territory. The necessary pursuit of a modern and active industrial policy means strengthening the competitive advantages of the industrial base, including by contributing to attractive framework conditions for both manufacturing and services, while ensuring the complementarity of the action at national, transnational and European level. Member States should:

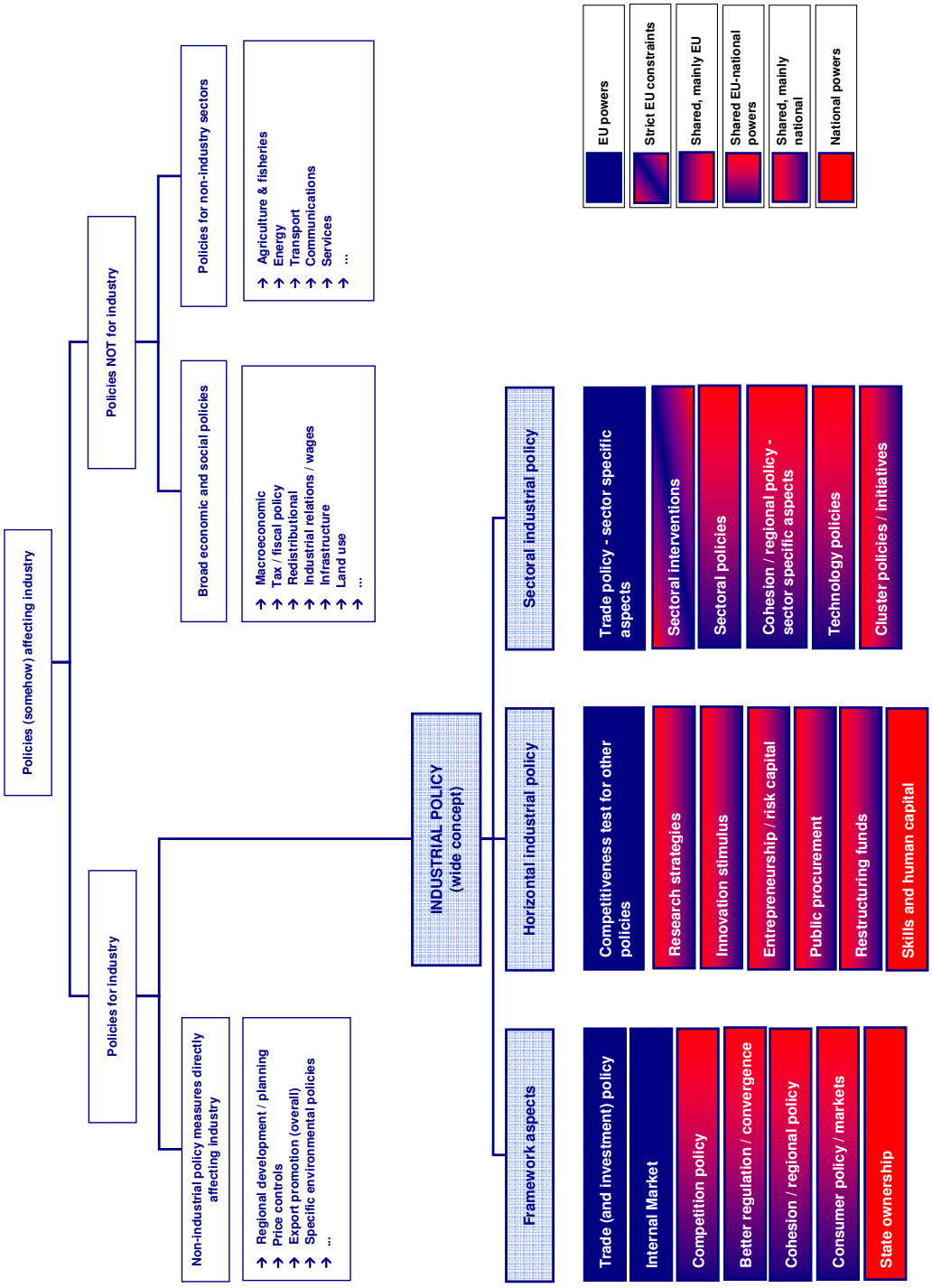
— start by identifying the added value and competitiveness factors in key industrial sectors, and addressing the challenges of globalisation;
— also focus on the development of new technologies and markets.

(a) This implies, in particular, commitment to promote new technological initiatives based on public–private partnerships and cooperation between Member States, that help tackle genuine market failures.

(b) This also implies the creation and development of networks of regional or local clusters across the EU with greater involvement of SMEs.

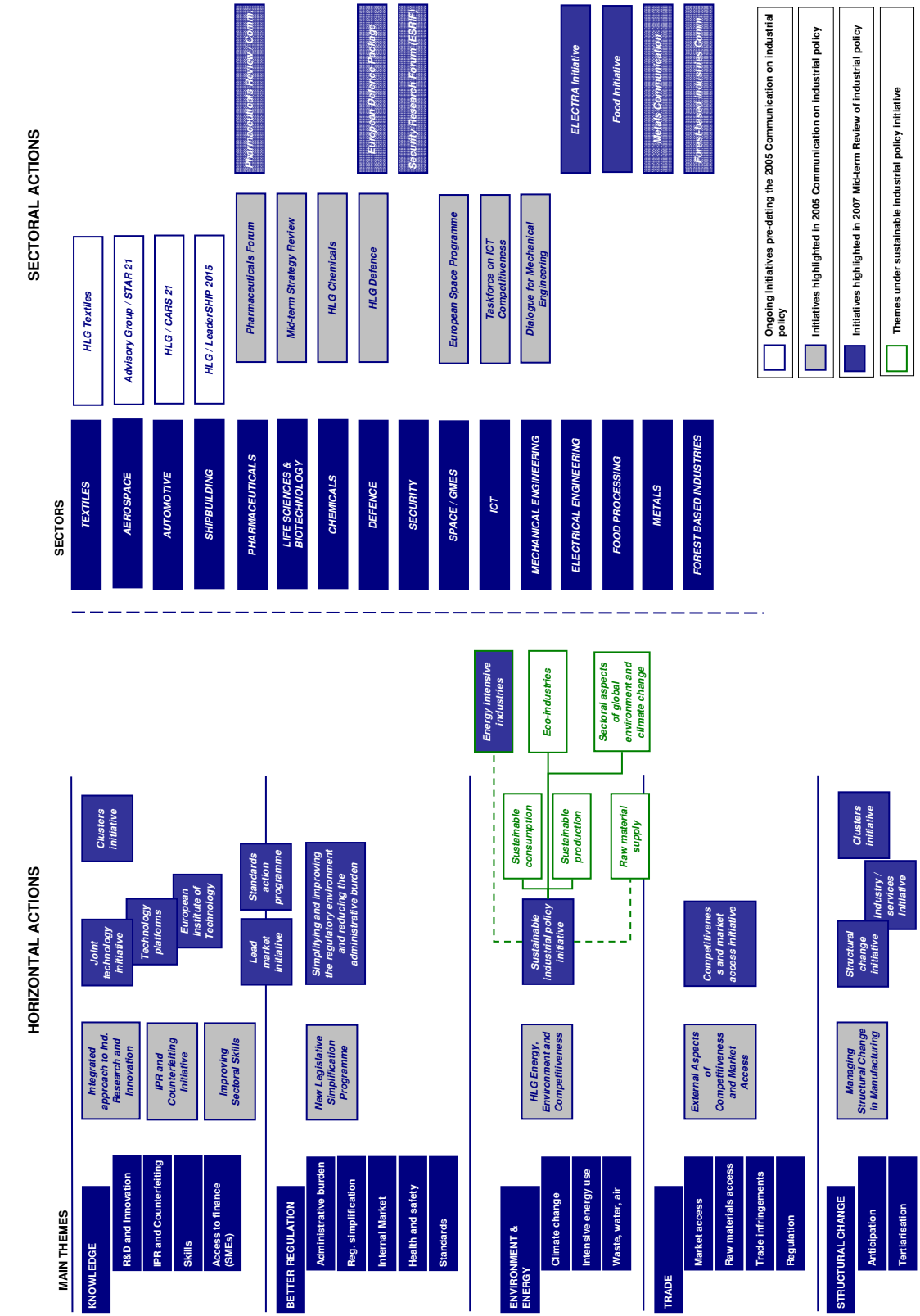
Source: Integrated Guidelines for Growth and Jobs (2005-2008)

Figure 0.1 Industrial policy classification and relation between EU and national powers



Source: adapted from Pelkmans (2006)

Figure 0.2 DG Enterprise main 'industrial policy' initiatives since 2005



1.4 Policy for industry or policy for enterprise?

From a historical basis, industrial policy has typically been associated with policy directed towards manufacturing sectors, or more broadly to include primary industries such as mining and other sectors such as construction that are seen to have similar characteristics or be closely intertwined with manufacturing[26]. However, to the extent to which 'industrial policy' is based on a horizontal approach and is concerned with providing the right environment ('framework conditions') for enterprise development it seems quite reasonable to presume that many potential industrial policy initiatives – for example, initiatives aimed at reducing administrative burdens, simplifying regulation, encouraging innovation and entrepreneurship, etc. – will be of relevance to a much broader scope of enterprises (and individuals) than just those within 'industry'.

Industrial policy and SMEs

The relevance of nominally 'industrial policy' measures to a broader scope of industrial and non-industrial enterprises appears to be particularly strong in relation to initiatives directed towards small and medium sized enterprises (SMEs), for which it is the size of the enterprise rather than their sector of activity that is often more pertinent from a policy perspective. In this regard, the relationship between EU policies for, for example, entrepreneurship and SME policy – e.g. the Small Business Act[27] – and 'industrial policy' is rather ambiguous.

It is somewhat difficult to draw a clear distinction between '*enterprise policy*' and '*industrial policy*'. In 2000 the Commission described enterprise policy as a policy that "needs to address the entire business environment to enable enterprises, whatever their size, legal form, sector or location to grow and develop."[28] Drawing on this description, the 2002 Communication on 'Industrial Policy in an Enlarged Europe'[29] stated that "*Industrial policy can … be defined as the application of enterprise policy instruments to the industry sector*". By contrast, more recent descriptions suggest that the term 'enterprise policy' has somehow become associated with policies directed towards – or, at least that place an emphasis on – small and medium sized enterprises and paying particular attention to manufacturing industry (see Box 1.5)[30]

[26] It may be noted, however, that as part of the strategic initiative 'An industrial policy for the globalisation era' contained in the Europe 2020 strategy, the Commission proposes to work "to enhance the competitiveness of the European tourism sector".

[27] COM(2008) 394

[28] Commission Staff Working Paper 'Towards Enterprise Europe: Work programme for enterprise policy 2000-2005', SEC(2000)771

[29] COM(2002) 714.

[30] It can also be noted that the European Parliament Fact Sheet on industrial policy describes industrial policy as follows: "Industrial policy is horizontal in nature and aims at securing framework conditions favourable to industrial competitiveness. Its instruments, which are those of enterprise policy, aim to create the general conditions within which entrepreneurs and businesses can take initiatives, and exploit their ideas and opportunities." Source: http://www.europarl.europa.eu/parliament/expert/displayFtu.do?language=en&id=74&ftuId=FTU_4.8.1.html

Box 1.5 Description of EU enterprise policy

EU enterprise policy

EU enterprise policy facilitates greater competitiveness and the creation of jobs. It pays particular attention to the needs of manufacturing industry and of small and medium-sized enterprises.

The focus of EU enterprise policy is on creating the right environment for investment in competitiveness and innovation, an environment in which strategically important sectors like aerospace and biotechnology, but also more traditional industries, such as textiles and the automotive sector, can prosper by being at the cutting-edge of technology.

Two thirds of all jobs in the EU are in SMEs. Ninety-nine per cent of all businesses in the EU are SMEs. Hence the Commission's watchword in its enterprise policy: 'think small first'.

Source: Europa – Gateway to the European Union website

Industrial policy and services

Any attempt to clarify the ambiguity between 'industrial policy' and 'enterprise policy' highlights a further, and perhaps even more vexing issue, concerning the distinction between policies for industry and policy for services. The rise of the services economy (so-called 'tertiarisation') has been well documented and it is abundantly clear that the relative weight of service activities – specifically market services – in overall economic activity in the EU far outstrips that of manufacturing. Accordingly, it could be argued that the focus of policy-makers attention should, first and foremost, be on the development of policy directed towards facilitating competitiveness irrespective of whether the enterprises or sectors concerned are engaged in 'industrial' or 'service' activities[31]. For example, one could envisage a 'policy for enterprise' covering *framework aspects* and *horizontal policy measures* for all business sectors (i.e. industry and services combined). The need to address sector specific aspects could then be addressed by adopting an extended approach to *sector-specific policy measures*, operating either directly at level of specific industry and service sectors or in a two-step process distinguishing first between industry and services and then secondly between individual sectors within these two groups.

Even if an industry-orientated perspective is retained, one can question the usefulness of an industrial policy that fails to adequately capture the close inter-linkages between industry and services. A number of lines of reasoning may be put forward as to why a closer connection between 'policy for industry' and 'policy for services' is logical and may be beneficial[32]:

- A substantial component of the growth of the (market) services sector is attributable to the 'outsourcing' of services activities previously undertake within industry to specialised service providers. This means that many service activities that previously could have been captured within the scope of industrial policy, and that nonetheless remain important for the overall performance of industry, now fall outside an industry-based definition of industrial policy.

[31] In this context, it is rather difficult to see the logic of grouping together industrial and enterprise policy – however defined – within one EU Directorate (i.e. DG Enterprise and Industry) while the apparent responsibility for services, which make up the vast majority of enterprises, rests with another Directorate (i.e. DG Internal Market and Services), particularly when the latter's primary focus covers only a rather limited scope of 'framework conditions' (i.e. obstacles to trade in services and financial markets within the Internal Market).

[32] See, for example, ECORYS (2008) "Study on Industrial Policy and Services" undertaken for DG Enterprise and Industry and available at: http://ec.europa.eu/enterprise/newsroom/cf/document.cfm?action=display&doc_id=4046&userservice_id=1&request.id=0

- Irrespective of the 'outsourcing' phenomenon, many service activities – notably business-related service – provide inputs that can make a critical contribution to the competitiveness of industrial sectors. Thus, in turn, the competitiveness of the service sectors delivering inputs to industry becomes a crucial part of the overall 'framework conditions' for industry.
- Many service activities are undertaken within industry (manufacturing) and a large proportion of the workforce in manufacturing firms can be engaged in service activities. For many industries (either at enterprise or sector-level), while still defined on the basis of the products (goods) that they supply, derive a significant part of their competitiveness either from internal services activities that – directly or indirectly – are integrated in their products, or from the delivery of services that accompany the goods that they provide.
- As an extension of the preceding point, we can witness the phenomenon by which firms shift from being manufacturers to 're-invent' themselves as service providers. This may take the form of a total reorientation of business or be part of an unbundling of production process – variously referred to as, or associated with, fragmentation, off-shoring, vertical specialisation and splitting-up of the value chain – through which firms disinvest themselves of actual manufacturing production processes (or relocate such processes outside Europe). Thus the activities of such firms – or the parts of their activities retained in Europe – become more closely associated with service activities rather than manufacturing activities.

All in all, the rise of the service economy is perhaps the most profound underlying structural change affecting growth and employment (i.e. wealth creation) in the EU. Moreover, services are important not only as an 'outcome' of structural change but also in terms of their potential role in facilitating adaptation of industry in response to broader pressures for change (e.g. globalisation, environment, etc.). Accordingly, an industrial policy that is concerned with "speeding up the adjustment of industry to structural changes" should arguably accommodate a significant services dimension. However, the development of a more integrated EU-level approach – recognising both the overall importance of services and the inter-relationship between industry (manufacturing) and services – has been quite limited to date. It appears that policy-makers are content to address the 'industry-services dimension' in the undoubtedly relevant but somewhat limited context of the Internal Market; for example, in 2009 the European Council acknowledged the fact that:

> "…industry and the services sector are increasingly intertwined and that professional, business and product-accompanying services are of large and ever growing importance for many industrial sectors. For this reason, the full and timely implementation of the Services Directive and making further improvements to the functioning of the internal market for services are crucial for industry"[33]

1.5 Industrial policy and competitiveness

In the previous sections we have contented ourselves with describing the main roles of (EU) industrial policy as providing the right framework conditions for enterprise development (and innovation), and facilitating adjustment processes in industries exposed to particular (structural) adjustment pressures. Underlying the focus on increasing the competitiveness of enterprises there is a broader objective of raising the contribution of 'industry' to achieving the overarching policy goals of economic growth and employment. The basic mechanism by which industry can

[33] Council conclusions: An integrated approach to a competitive and sustainable industrial policy in the European Union. Brussels, 19 May 2009, 10082/09

contribute to this overarching goal is through raising industrial productivity. In other words, industrial policy – or at least those industrial policies intended to raise competitiveness of industry[34] – is essentially about raising productivity.

Given the importance of the concepts of 'competitiveness' and 'productivity' for industrial policy it is perhaps worthwhile to consider how they actually relate to each other. As a starting point, the basic mechanism for generating economic growth is to increase the absolute level of domestic productivity (i.e. within the economy) irrespective of how this absolute level compares relative to other countries or regions[35]. Raising domestic productivity implies that greater value added can be generated for a given level of inputs, thus raising the income (economic return) of inputs employed; i.e. for a given level of inputs (factors of production) employed, the rate of economic growth will be determined by the rate of domestic productivity growth. At the same time, to the extent that growth in factor incomes generates increased demand, then this will allow for additional factors to be brought into employment. Basically, increasing the absolute level of domestic productivity is the basis for economic growth and employment creation. Riess and Välilä (2006)[36] summarise this argument as follows:

> "… the ultimate purpose of industrial policy, however defined, is to raise domestic productivity – not productivity relative to other countries. In other words, to promote economic growth and create jobs, Europe must become more innovative and productive even if it was the only place in the Universe."

In this context, we can see that industrial policy is not just concerned with the enhancing the performance of EU industry in terms of its ability to compete in international (global) markets. First and foremost, there is an '*internal*' dimension which is concerned with productivity growth and increasing the efficiency of resource use within the (domestic) economy, irrespective of whether – and to what extent – enterprises or sectors are subject to international competition.

Of course, there is an '*external'* dimension to industrial policy, which is concerned with the performance of industry (and the sectors and enterprises therein) in an international context; i.e. how well do EU firms – and by extension sectors and industry as a whole – perform in international (globalised) markets? Moreover this question is of increasing relevance as markets for more and more products and services are – actually or potentially – opened up to international competition.

A usual starting point to address the question of the external competitiveness of EU industry is through the examination of the relative prices of EU goods and services vis-à-vis those produced elsewhere. At the same time, although it is understandable that attention is often focussed on the comparison of international '*price competitiveness*', it is important to recognise at the outset that competitiveness depends not only on price but also on 'quality' aspects of the products and services supplied. These '*quality competitiveness*' aspects can be considered as encompassing both '*product quality*' related to the characteristics embedded within products themselves (e.g. product performance, reliability, etc.) and '*service quality*' related to supply performance and associated

[34] There may be other 'non economic' objectives ascribed to industrial policy, for example in terms of other strategic objectives such as geopolitical influence and security (e.g. defence industry) or to ensure access to critical assets and technologies.

[35] Of course, differences in relative productivity – specifically the comparison between European productivity levels with higher levels achieved elsewhere – provide an indication of the potential additional contribution to economic growth that could be achieved through raising domestic productivity.

[36] Armin Riess & Timo Välilä (2006), "Industrial policy: a tale of innovators, champions, and B52s 10" in *"An industrial policy for Europe? Context and concepts"* EIB Papers Volume 11 N°1 2006

services (e.g. reliability of supply/delivery, technical support and maintenance services, etc.). As mentioned in Section 1.4, many goods producing (manufacturing) firms increasingly rely on the services embedded in their products or on product-accompanying services as a source of competitive advantage.

Bringing a quality dimension into the evaluation of competitiveness raises a further issue related to our understanding of the relationship between productivity and competitiveness. For standardised – or non-differentiated goods or services – productivity can be relatively easily assessed on the basis of the ratio between resources used and the quantity – or value-added – of output produced; in other words, productivity (and hence competitiveness) relates to the '*efficiency of production*'. However, where goods or services are non-standardised – and specifically where they are differentiated in terms of quality – the relationship between efficiency of production and productivity is less straightforward. In particular, for services it is generally recognised that productivity depends not only on the efficiency of production but also on the effectiveness of the service supplied (i.e. '*effectiveness of production*' or how well the service activity is performed). To the extent to which services are embedded in, or supplied alongside, manufactured goods – and, by extension, if product quality is considered as analogous to a service characteristic of a good – then productivity (and hence competitiveness) will depend on both the efficiency and effectiveness of production, and their relative importance within overall production processes.

Leaving aside the aspect of quality competitiveness, it is evident that international price competitiveness of firms from one country (location) will to a large extent depend on their relative costs of production vis-à-vis firms producing in another country. In an international context we can distinguish between:

- ***'Cost competitiveness'***, which reflects the relative costs of producing goods and services in one country vis-à-vis the costs of producing them in another country. Essentially, cost competitiveness relates to the extent to which production costs for firms in one country are lower than those for firms in another country.

  The assessment of cost competitiveness is based on the relative cost (price) of production inputs such as labour, energy, raw materials, capital, etc. in either nominal terms (i.e. the average cost (price) per unit of production input) or adjusted for productivity differences (i.e. the average cost (price) of production inputs per unit of output). Thus, EU cost competitiveness may be enhanced by reduction in the cost (price) of inputs used by EU producers relative to their competitors or through an increase in their relative productivity, which implies a reduction in quantity – and hence cost – of inputs required per unit of output.

- ***'Price competitiveness'***, which reflects the relative prices of goods and services from one country vis-à-vis those of competitor countries. Typically price competitiveness is seen as relating to the ability of firms from one country to sell their goods and services at a price that is lower than that of firms from another (competitor) country[37].

  The assessment of price competitiveness may be based on the relative price (i.e. measured in the appropriate market currency) of goods and services from one country vis-à-vis those from another country. Using a simple model of firm pricing behaviour, we can think of individual

[37] We can further distinguish an outward dimension ('*export price competitiveness*'), reflecting the relative prices of EU exports in foreign markets compared to those of local (foreign) producers and/or other international competitors in these markets, and an inward dimension ('*import price competitiveness*') reflecting the relative prices in EU markets of imported goods and services compared to those produced within the EU.

firms as setting their output price – or domestic sales price – on the basis of their costs of production plus a sales mark-up (i.e. profit margin). Leaving aside transport costs and other foreign trade costs, a firm's output price will be converted to a foreign market sale price on the basis of the exchange rate between the domestic and foreign currency. Thus, price competitiveness can be assessed by comparing output prices (or domestic sales price) converted according to the relevant currency exchange rate(s)[38].

In evaluating cost competitiveness and price competitiveness it is evidently important to recognise the influence of exchange rates on relative costs and prices across countries[39]. For firms in a country whose currency is appreciating, the relative cost (in common currency) of production inputs that are determined in domestic currency terms will increase compared to firms in the country whose currency has depreciated. Most obviously, this applies to the cost of labour which is normally determined in domestic currency terms, while for other inputs that are imported or whose price is otherwise set in international markets (e.g. costs of finance) the effect of a currency appreciation on relative costs is less certain. On balance, although a currency appreciation implies a loss of cost competitiveness, the magnitude of the impact will also depend on the relative proportion of total production costs determined in domestic currency compared to those set in non-domestic currency[40].

The extent to which a loss of cost competitiveness translates into a loss of actual price competitiveness will depend on market conditions and on firms' behaviour. In particular, it will depend on the extent to which goods and services from the country whose currency appreciates actually compete with goods and services from the depreciating country (in either export or domestic markets). Also, firms may respond – at least in the short run – by reducing their margins in order to absorb part of the negative impact of higher relative costs on their prices. At the same time they may try to push part of their loss of competitiveness on to their own suppliers, thus increasing the downward pressure on (domestic) input prices. At a more structural level, firms may respond by seeking to reorganise production process – including possible relocation of production activities, which may be facilitated through a higher exchange rate that reduces the cost of FDI. However, the most important basis for sustaining cost and price competitiveness in the long term will come from raising (domestic) productivity.

From a productivity perspective, to be competitive in international markets the relative productivity of EU firms compared to international competitors (either incumbent domestic firms in foreign markets or other international competitors in these markets) needs to be sufficiently high to offset the additional transport costs (and other foreign trade related costs) associated with serving foreign markets and still enable them to supply their goods and services at prices that are 'competitive' within these markets. Similarly, the higher the productivity of foreign firms relative to EU firms then the greater will be their potential to compete in EU markets. Essentially, more

[38] It should be noted, however, that actual market prices are an outcome of supply and demand conditions within the relevant market. Specifically, in assessing price competitiveness, account needs to be taken of the fact that some firms/countries may enjoy sufficient market power to influence market prices ('price leaders) while others ('price takers') will have to take the price set by the market for their goods and services.

[39] In this respect, one important issue – that we will not deal with here – concerns the appropriate exchange rate to be used when converting costs measured in domestic currencies into a common (comparator) currency.

[40] At one extreme, if the prices (costs) of all production inputs are set in domestic currency terms then the loss of cost competitiveness will be proportional to the currency appreciation. The greater the share of non-domestically priced inputs in total production costs then the less will be the direct correspondence between the rate of currency appreciation and the loss of cost competitiveness.

productive firms are more likely to be able to compete internationally while less productive firms will be restricted to their domestic markets and be more vulnerable to foreign (and domestic) competition.

In terms of industrial policy, if we consider that exchange rate 'policy' remains outside the industrial policy domain and that industrial policy can have only limited influence on prices of many production inputs, then the main contribution of industrial policy to international performance will come through enhancing industrial productivity. Specifically, as firms with high productivity should be more capable of gaining international market share (and retaining domestic market share), countries that are able to create an environment (i.e. 'framework conditions') that encourage the development of high productivity firms are more likely to do well in terms or their (net) export performance. To quote Jean-Claude Trichet, President of the ECB:

> "Countries in which highly productive firms can thrive are […] likely to do better in terms of their overall export performance, as this will allow more firms to compete successfully in international markets."[41]

To the extent that firms are able to compete successfully in international markets and expand production through exports, this will increase the employment of factors of production, which will contribute to economic growth and employment. Further, there may be an additional incremental effect if exports raise the productivity of factors already employed, for example through economies of scale or because a higher rate of value-added can be achieved in foreign markets relative to domestic markets.

From the above discussion, we can distinguish an '*internal*' contribution to economic growth that stems directly from raising domestic productivity and an '*external*' contribution to economic growth (via net exports) that is strongly associated with – but that is not an inevitable outcome of – raising domestic productivity relative to that of other countries. Basically, raising the level of domestic productivity relative to other countries increases the likelihood of a positive *external* contribution to economic growth but is not a guarantee of such a contribution. The actual impact of an increase in relative productivity on *external* competitiveness will depend, on the one hand, on market conditions; for example, the extent to which an absolute advantage in productivity terms (i.e. lower absolute price) is necessary to be competitive in international markets. On the other hand, even if EU firms (or sectors as a whole) enjoy a productivity advantage over firms from other countries/regions, there may be other factors not linked to productivity that may prevent EU firms from competing in international markets. These may relate to a variety of (formal or informal) market access barriers (including the inherent 'tradeability' of products and services), or simply from the behaviour of EU firms that may not seek to compete in international markets. Finally, account needs to be taken of the impact of macroeconomic factors, notably exchange rate movements that influence the extent to which changes in domestic productivity (measured in local currency) translate into changes in relative international productivity levels.

Recalling that EU Treaties frame industrial policy within the context of ensuring the conditions necessary for the competitiveness of the Union's industry then, from the preceding discussion, we can distinguish two categories of competitiveness that are relevant from a policy perspective:

[41] "The external and internal dimensions of Europe's competitiveness", Speech by Jean-Claude Trichet, President of the ECB at the Institute of International and European Affairs Dublin, 26 February 2009. Text available at http://www.ecb.int/press/key/date/2009/html/sp090226.en.html

- ***'Internal competitiveness'*** which is concerned with raising domestic productivity as a basis for economic growth. The main contribution of internal competitiveness to economic growth and employment operates through increasing the value-added generated by factors of production (i.e. efficiency effect).
- ***'External competitiveness'*** which is concerned with the capabilities of enterprises, sectors or industry as a whole to compete internationally, which can be assessed amongst other things by changes in international (and domestic) market shares. Although linked to raising domestic productivity – more specifically raising domestic productivity relative to that of international competitors – it depends on other factors as well. The main contribution of external competitiveness to economic growth operates through increasing net exports and, hence, the employment of factors of production (i.e. volume effect).

1.6 Industrial policy and structural adjustment

Beyond creating the right framework conditions for industrial competitiveness, a second(ary) role of industrial policy is to facilitate (speed-up) adjustment processes in industry, specifically in response to so-called '*structural change pressures*'. Typically, this role is associated with measures for declining industries and normally directed towards mitigating the associated adverse social consequences. Looking more broadly, policies to facilitate adjustment processes reflect a recognition that industry – whether at the level of individual firms or industrial sectors – needs to continually adapt in response to changing economic, market, technological, social and other conditions.

In this context it is perhaps worthwhile to distinguish between different economic levels at which structural adjustment can be observed. At the risk of oversimplification, processes of structural change can be considered at four broad levels:

- ***Macro sector level***, which considers the patterns structural change in terms of the allocation of economic activity/resources across three broad sectors: primary (i.e. agriculture, forestry, fishing and mining industries), secondary (i.e. manufacturing, and frequently construction, also), and tertiary (i.e. all other activities, essentially services). More recently, as the service sector has grown to become the dominant component of the economy, attention has shifted to the pattern of structural change within the service sector and, specifically, the so-called process of 'quarternarisation' associated with the rise of information and knowledge-based services.
- ***Sector level*****,** which is mainly concerned with changes in the distribution of activity/resources across component sectors of the three broad sectors described above. At this level, and with regard to manufacturing, there has been a wide variation in the experience of different manufacturing sectors within developed economies and, also, in the experience of specific sectors across different countries. Pilat *et al* (2006)[42], for example, point to the differential employment impacts across industries of strong demand (e.g. pharmaceuticals and motor vehicles), international competition of low-cost countries (e.g. textiles), and proximity to market requirements (e.g. food products) as factors underlying differences in performance across manufacturing sectors. It is also worth noting another finding from this study, namely that:

  > "recent changes in OECD manufacturing employment do not reflect a shift from low- to high technology industries, as was the case in the 1980s. While OECD production and trade patterns in

[42] Pilat, D. et al. (2006), "The Changing Nature of Manufacturing in OECD Economies", OECD Science, Technology and Industry Working Papers, 2006/9, OECD Publishing.

manufacturing clearly demonstrate the growing importance of high-technology manufacturing, employment data show that only one high-technology industry, pharmaceuticals, has experienced employment growth over the past decade. Other high-technology industries have all experienced a considerable decline, with computers and aircraft and spacecraft having the most rapid declines in employment of all manufacturing industries, with the exception of textile products."

- ***Within sectors***, which focuses on changes in market shares within a single industry, typically considered in terms of changes in the market shares of individual firms (or groups of firms) or types of labour. Changes in the composition of the products supplied by a sector - for example, in the form of moving up the value or the introduction of new products (and services) represents another form of structural change.
- ***Within firms***, which focuses on changes in the structure of production processes within firms. Much of the recent discussion of globalisation has focussed on the fragmentation of production processes (also referred to as vertical specialisation and slicing up the value chain). Here, the process of structural change can be considered to move from outside the firm (or production unit) to within the firm. Rather than competition taking place at the level of final products, it takes place at the level of specific task or activities or tasks within production processes. This phenomenon is closely linked to processes of outsourcing and, at an international level, off-shoring behaviour (see Box 0.6). Initially associated with manufacturing processes *per se*, fragmentation and specialisation is seen increasingly to also encompass service activities that are associated with manufacturing; in particular where outsourcing/trade in services has been facilitated by advances in digital technologies and low telecommunication costs. The main point here is that processes of structural change can take place within the firm, with firms changing the composition of the portfolio of activities (tasks) that they undertake, focussing on those activities that enable them to develop competitive advantages whilst, at the same time reducing other activities or having them contracted-out to specialist providers. Such changes are, in turn, reflected in changes in the composition of the types of jobs, work process, and skill requirements of workers within firms and, at a more aggregated level, within the sector as a whole.

Box 0.6 Globalisation and the unbundling of production

Baldwin (2006)[43] characterises the development of globalisation in terms of two stages:

- The first unbundling, whose origins can be traced back to the end of the 19th century and with more recent impetus dating from the 1960s, was driven by rapidly falling transportation costs. The reduction in these costs has the effect of removing the necessity to make goods close to the point of consumption, thus providing a spur for international trade in goods.
- The second unbundling, which began in the 1980s, has been driven by rapidly falling communication and coordination costs. Initially, the reduction in these costs was observed through the removal of the need to perform manufacturing stages near to each other, thus facilitating the geographical dispersion of different production activities related to the same product; reflected, notably, in the 'offshoring' of labour intensive (and low skilled) production stages. More recently, the phenomenon has been seen to extend from factories to offices, and from manufacturing to services, driven by the advances in digital technologies and virtual zero telecommunication costs that have meant that service activities previously considered non-traded became freely traded.

This second unbundling, (which has variously been referred to as fragmentation, offshoring, vertical specialisation and slicing up the value chain) has important implications for the way in which we view the structural adjustment pressures of globalisation on industry. In particular, under the first unbundling (in which production processes remained spatially grouped together) global competition occurs at the sector-to-sector or firm-to-firm level. Under the second unbundling (in which production processes can be spatially unpacked), however, competitive pressures operate at the level of the production or service activity – which the author refers to as 'tasks' – and it is the task, rather than the sector or the firm, which becomes the common denominator for evaluating competitiveness. In other words, under the second unbundling we are moving towards a new paradigm in which production can be seen as a 'package of tasks' and international competition take place in trade in tasks (i.e. competition between workers

[43] Baldwin, R. (2006), "Globalisation: the great unbundling(s)", contribution to the project 'Globalisation Challenges for Europe and Finland', organized by the Secretariat for the Economic Council of Finland

performing the same task in different countries).

The implications from this 'new paradigm' are far reaching. For a start, it implies that evaluation competitiveness at a 'traditional' sector level (or even a firm level) becomes less relevant where the package of tasks provided by the sector can be unbundled and where, as a consequence, international competition/trade takes place at the level of individual tasks. Thus, for example, the average productivity – the traditional measure of competitiveness - of sectors becomes far less relevant than the productivity of individual tasks (production processes) for evaluating competitiveness.

Furthermore, whereas changes in transport costs (i.e. the driving force of the first unbundling) can be expected to impact relatively evenly across different goods, and therefore affect sectors in a similar and reasonably predictable way, this is not the case for changes in communication and coordination costs. Changes in information technology and communication costs will impact on the 'tradeability' of some tasks and not others; for example, where the task is or is not amenable to a new communication technology (e.g. extent to which it can be codified), or where performance of the task still requires geographical proximity to another spatially 'fixed' part or the production process, supplier, or customer. Moreover, there is no reason why the changes in trade costs (i.e. communication and coordination costs) should be correlated to the initial competitiveness of the task; in other words, changes in trade costs may substantially reduce the competitiveness of some initially highly competitive tasks, while leaving some relatively uncompetitive tasks unaffected.

Baldwin summarises the implications of the second unbundling under three headings:

- **Unpredictability:** the complex interactions between different tasks are poorly understood, which makes it difficult to predict how a particular bundle of tasks will unravel in the face of changes to the cost of exchanging information and coordinating production across distance. This implies that winners and losers from globalisation are much harder to predict.
- **Suddenness:** the development of new technologies and their impact on costs of communication and coordination is difficult to foresee, as is the way and speed with which firms respond in terms of the management and organisations of tasks. Rather than a gradual change, the incremental effect of changes may arrive at a certain point (a tipping point) at which a task can, for example, be offshored to a lower cost location. Thus, tasks seen to be relatively safe from international competition can suddenly be at risk.
- **Individuals not firms, sectors or skill groups:** the forces of globalisation will operate at a finer resolution; with international competition increasingly play itself at the level of the tasks within a firm. Thus, looking at the competitiveness (productivity) of a firm as a whole, or the average competitiveness of the firms within a sector may provide poor indicators of the position and perspectives in terms of globalisation impacts. Whereas, for workers, what is important for evaluating these impacts is no longer simply the skill group to which they belong, but also the specific characteristics of the tasks they perform (and their relationship to other tasks) in terms of their 'vulnerability' to technological changes affecting communication and coordination costs

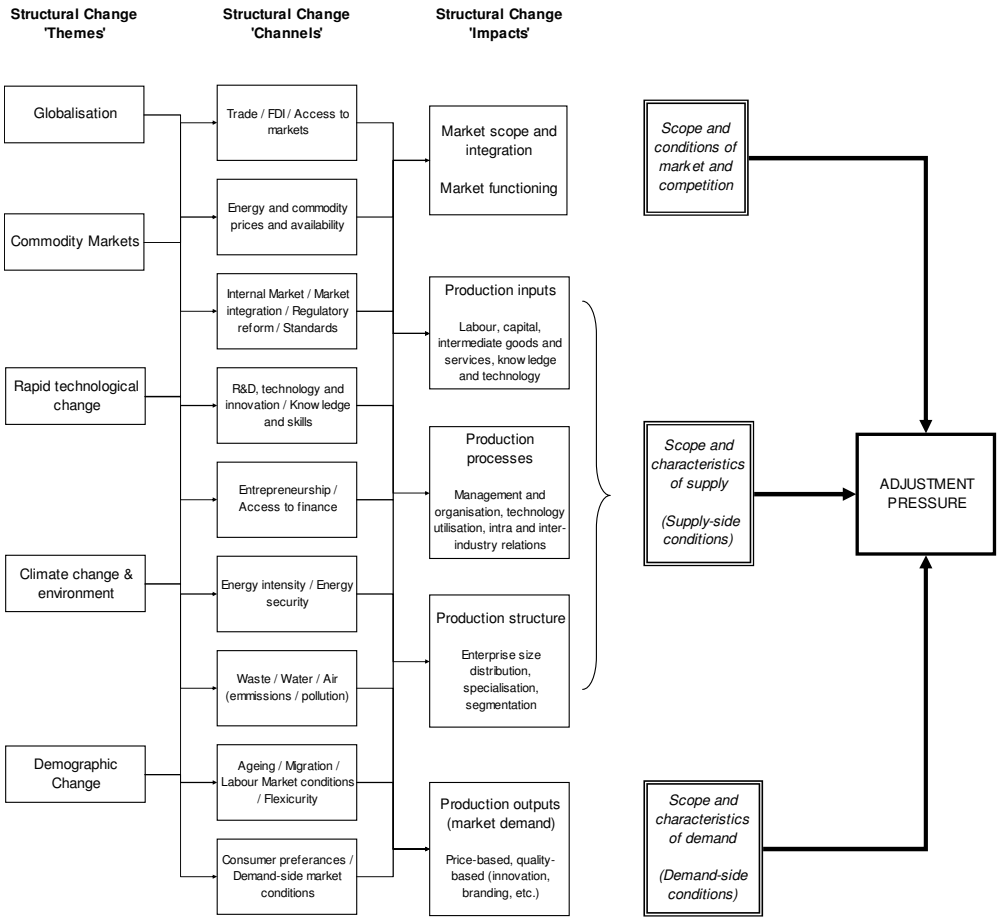
The types of factors identified as being responsible for creating the conditions and, in turn, the pressure on industry sectors (and the firms therein) for structural change include broad 'persistent' themes such as globalisation, speed of technological change, climate change and environment, and demographic change, to which may be added more 'sporadic' themes related to shorter-run events or specific shocks such as commodity and financial market volatility. In turn, these '*drivers of structural change*' trigger developments such as the introduction of major technological and organisational innovations, the emergence of new competitors and increased competition, adjustments to the availability of inputs and market access, shifts in consumer demand, or changes in regulatory environments etc. that impact on the business environment and business processes. In general, the various drivers of structural change can trigger multiple developments that impact on industry and that operate through a variety of '*structural adjustment channels*'.

Broadly speaking we can make a distinction between impacts of 'drivers of structural change' that operate through channels that influence demand-side conditions and those that operate through channels that influence supply-side conditions; with in some cases 'drivers' that will impact on both demand and supply side conditions. Further, we can add structural change drivers that operate through channels – normally 'regulatory' policy measures – that influence the functioning and scope of markets. Thus, we can distinguish three broad categories of structural change impacts leading to structural adjustment pressure:

- ***Market functioning and scope*** that are reflected, for example, in changes in conditions governing competition with the markets (e.g. competition policy and regulations); but, also, market access and market integration (e.g. trade policy, internal market, standards).
- ***Demand-side impacts*** that, for example, influence the level and/or scope of markets, or the nature and characteristics of demand;
- ***Supply-side impacts*** that are reflected in changes in production conditions within industry. These may be further differentiated according to impacts in terms of production input effects, productions process effects, or production structure effects. Where these effects will be shaped by the different strategies and business models of firms.

Figure 1.3 tries to illustrate the distinction and inter-relationship between broad structural adjustment 'themes', adjustment 'channels', and 'impact' categories. To provide an example: rapid technological change is one of the 'themes' of structural adjustment, within which a specific 'channel' may be related to ICT developments. The impact of ICT, both in terms of changes associated with and necessitated by ICT uptake has been identified as being at the forefront of technological changes creating pressures on enterprises to adapt production and organisational structures, and to adopt new management approaches. The types of organisational change involved are multifaceted (e.g. affecting organisational structures, work process, human resource and industrial relations practices, and business practices and management techniques) but are, broadly speaking, encompassed within the heading of e-business practices (including e-commerce). This being the case, we could consider that ICT developments are primarily associated with 'impacts' that are related to production processes. At the same time, however, increased utilisation of ICT may be associated with changes in production inputs (e.g. investment in ICT equipment, changes in required labour skills etc.) and production structures (e.g. outsourcing and off-shoring). Furthermore, the utilisation of ICT to develop e-commerce applications, which enable firms to expand markets (or its supplier base) could also be considered under the category of impacts related to 'market functioning and scope'.

Figure 1.3 Structural change drivers and adjustment pressure



The overall adjustment pressure on industrial sectors can be seen as an 'aggregate' of the various forces operating through these channels and stemming from structural change drivers. The extent that these 'drivers' are translated into structural adjustment pressure will depend, however, on the responsiveness of both demand and supply (separately) to the 'driver', and the way in which supply and demand interact to determine the overall condition of the market. In this context, in addition demand and supply conditions, overall market conditions – referred to as the *institutional framework* (i.e. regulatory and other framework conditions) – will also influence the ability of supply (industry) or demand (consumers) to respond to a structural adjustment driver; i.e. the institutional framework will influence the responsiveness (in terms of size and/or speed of change) of supply and/or demand.

At the same time as influencing responsiveness to structural change pressure, changes in the institutional framework can themselves be used to encourage structural change; for example, environmental regulations may increase certain input costs, or necessitate changes in production technologies, or prohibit the production and sale of certain products. Similarly R&D, ICT and other technology-related policies may be used in an effort to shift industry towards high-technology manufacturing. These types of change in the institutional framework can be seen, therefore, to create adjustment pressures in much the same way as other adjustment drivers.

Allowing for the inclusion of policy measures aimed at moving industry towards specific types of activities or business processes within the definition of industrial policy (i.e. measures to promote structural adjustment), adds a dimension that goes beyond typical *'neutral'* or *'passive'* policy measures aimed at creating benign framework conditions for enterprise development and competitiveness. It implies that industrial policy may also encompass more *'positive'* or *'active'* policy measures aimed at influencing and promoting the (structural) development of industry in specific directions.

From the above, industrial policy in the context of structural adjustment can be seen to encompass the following elements:

- ***'Market functioning measures'*** aimed at shaping industrial adaptation in response to structural adjustment drivers or 'other' policy objectives. Typically this encompasses the use of regulatory measures that provide incentives or impose requirements on industry that reinforce structural adjustment pressures on industry (i.e. both 'carrot' and 'stick' measures may be applied). Most obviously, in the current context, this can be related to policy directed towards, for example, changing energy utilisation and environmental emissions by industry in the context of climate change and sustainable development objectives.
- ***'Supporting measures'*** aimed at facilitating processes of industrial adaptation through support for 'industry' efforts to exploit new opportunities and respond in an active and positive way to threats created as a result of changing conditions. Such measures can be considered as extension of role of industrial policy to provide the right framework conditions for enterprise development and competitiveness, albeit with a potentially more sector specific dimension given that adaptation requirements can be expected to differ across sectors.
- ***'Mitigating measures'*** to be applied to ease transition in declining industries where the negative impacts of changing conditions on business performance are beyond redress through 'positive measures' and where the extent of adverse effects associated with industrial decline – typically in terms of loss of employment – is sufficient to warrant temporary policy interventions. Although 'entitlement' to such measures may be based on general principles applicable across industry as a whole, clearly there is a sector-specific dimension in terms of the application of such measures to particular (declining) sectors.

1.7 Industrial policy and sustainable development

In the preceding sub-section, the argument was made that the ultimate aim of industrial policy is to enhance the contribution of industry to economic growth (and employment). The mechanism for achieving this aim is primarily through measures to improve the 'framework conditions' so as to enhance the competitiveness of industry. Industrial policy is, however, also subject to other broad policy objectives and desired outcomes beyond the contribution of industry to economic growth and that influence the way in which competitiveness is (or should be) achieved.

The (re-launched) Lisbon Strategy, which set out the main policy framework for EU industrial policy, is not simply concerned with delivering growth and employment but, also, that this employment should be in the form of 'better jobs'. This emphasis on 'more and better jobs' is a reflection of broader policy concerns related to social inclusion and cohesion within Europe both in a general and regional context. At the same time, the Lisbon Strategy also emphasises the coherence between the growth and employment agenda with the EU's commitment to sustainable

development. Essentially the shorter-run ambitions of the Lisbon Strategy are presented as being consistent with the overarching – and longer run – objectives of sustainable development:

> "Making growth and jobs the immediate target goes hand in hand with promoting social or environmental objectives. The Lisbon Strategy is an essential component of the overarching objective of sustainable development set out in the Treaty: improving welfare and living conditions in a sustainable way for present and future generations. Both Lisbon and the Sustainable Development Strategy contribute to ensuring this goal. Being mutually reinforcing, they target complementary actions, use different instruments and produce their results in different time frames."[44]

> "The EU SDS forms the overall framework within which the Lisbon Strategy, with its renewed focus on growth and jobs, provides the motor of a more dynamic economy. These two strategies recognise that economic, social and environmental objectives can reinforce each other and they should therefore advance together. Both strategies aim at supporting the necessary structural changes which enable the Member States´ economies to cope with the challenges of globalisation by creating a level playing field in which dynamism, innovation and creative entrepreneurship can flourish whilst ensuring social equity and a healthy environment."[45]

In this context, it is worth noting the wide definition of sustainable development incorporated within the EU Sustainable Development Strategy (SDS):

> "It [sustainable development] is about safeguarding the earth's capacity to support life in all its diversity and is based on the principles of democracy, gender equality, solidarity, the rule of law and respect for fundamental rights, including freedom and equal opportunities for all. It aims at the continuous improvement of the quality of life and well-being on Earth for present and future generations. To that end it promotes a dynamic economy with full employment and a high level of education, health protection, social and territorial cohesion and environmental protection in a peaceful and secure world, respecting cultural diversity."[46]

Placing industrial policy in the broad framework of the EU's Sustainable Development Strategy, the underlying objectives of industrial policy can be formulated not only in terms of the contributions of industry to economic welfare – the core purpose of industrial policy – but also in terms of its coherence with and contribution to social and environmental welfare, as follows:

- ***Economic welfare*****,** which relates to the contribution of industry to economic growth and employment, and underpins the competitiveness dimension of industrial policy.
- ***Social welfare***, which relates to the contribution of industry to social inclusion and cohesion. On the one hand, this directly concerns the level and growth of industrial employment but also takes account of the nature ('quality') of jobs created within industry. On the other, it embraces wider dimensions of 'social welfare' in the context of the role of industry in regional cohesions (e.g. regional/cohesion policy) and also industrial adaptation to structural change pressures (e.g. support for workers in declining industries).
- ***Environmental welfare*****,** which related to the contribution of industry to achieving a (more) sustainable utilisation of resources – both within industry itself (i.e. industrial production) and

[44] COM (2005) 24 "Working together for growth and jobs: A new start for the Lisbon Strategy"
[45] 10917/06 "Renewed EU Sustainable Development Strategy"
[46] 10917/06 "Renewed EU Sustainable Development Strategy"

in other economic activities and final markets (i.e. consumption) – and to reducing negative impacts of economic activities on the environment.

Following from the above, it is possible to distinguish a broad and narrow concept of *sustainable industrial policy*. The broad concept – aligned to the wide scope of sustainable development adopted under SDS –would integrate the full range of economic, social and environmental aims and objectives set out above. This can be contrasted with a narrower concept of sustainable industrial policy focussed more directly on the environmental aspects, such as sustainable resource utilisation and environmental protection.

An issue that arises when we start to consider sustainable industrial policy is the connection between the concepts of sustainability and competitiveness. On the one hand we can consider sustainable competitiveness as simply the ability to maintain competitiveness over a long (sustained) period of time, irrespective of the basis on which this competitiveness is assured. On the other hand, we can consider sustainable competitiveness in terms of achieving competitiveness whilst at the same time contributing to the aims, and complying with the requirements, set for (broad or narrow) sustainable development. Of course, it is arguable that both of these notions of competitiveness ultimately amount to the same thing, if 'long-run' competitiveness is considered to be possible only if the objectives of sustainable development are achieved. However, as there is often a certain degree of ambiguity in the way that the term 'sustainability' is attached to 'competitiveness', and often with little regard to the notion of sustainable development outlined above, it is perhaps worthwhile to make a distinction between:

- ***Sustained (industrial) competitiveness***, reflecting the ability to maintain the competitiveness of industry over a long (sustained) period of time;
- ***Sustainable (industrial) competitiveness***, reflecting the ability to achieve (and maintain) the competitiveness of industry in accordance with sustainable development objectives. Narrowly defined, these objectives imply that competitiveness should be achieved while using resources in an efficient and sustainable way while minimising negative environmental impacts (i.e. enhancing environmental welfare). More broadly, competitiveness should be achieved while respecting social welfare objectives, such as social equity and cohesion.

The EU Sustainable Industrial Policy Action Plan

Although achieving a sustainable growth path has very wide reaching implications for industry, EU policy actions that are explicitly labelled under the heading of 'sustainable industrial policy' appear rather limited. Current EU sustainable industrial policy (SIP) is amalgamated with sustainable consumption and production (SCP) in a single Action Plan (see Box 1.7). This Action Plan contains somewhat more concrete initiatives aimed at 'smarter' consumption and 'better' products, but rather vague actions in relation to industrial production[47]. Concerning 'actions' that can be linked more directly to the international environment, these include:

- promoting sectoral approaches in international climate negotiations;

[47] These include: (i) *boosting resource efficiency*: e.g. tools to monitor, benchmark and promote resource efficiency; (ii) *supporting eco-innovation*: e.g. tools to monitor, benchmark and boost eco-innovation; a voluntary, partly self financing, EU wide environmental technology verification scheme; (iii) *enhancing the environmental potential of industry*: e.g. revision of the Community eco-management and audit scheme (EMAS); developing policy initiatives for environmental regulations (screening of regulatory barriers and market failures); helping SMEs (use of Enterprise Europe Network to disseminate know how and expertise in the field of energy and environment).

- promoting good international practices in relation to sustainable consumption and production policies;
- promoting international trade in environmental goods and services through trade negotiation, including efforts to support the adoption of EU environmental and energy standards as the basis for international standards.

Box 1.7 EU sustainable industrial policy

Sustainable industrial policy and related measures

Sustainable development - within which economic growth, social cohesion and environmental protection go hand in hand and are mutually supporting - is an overarching long term goal for the EU. In line with the EU Strategy for Sustainable Development (EU-SDS)[48], the EU has endeavoured over recent years to 'mainstream' the objective of sustainable development across a broad range of policy areas[49]. Specifically, from an industrial policy perspective, the EU approach is built upon three basic principles of sustainable industrial policy[50]:

- Stimulating the development and commercialisation of low carbon and energy efficient technologies, products and services: *'sustainable product policy'*;
- Creation of a dynamic internal market that is supportive of environmental products and services: *'industrial policy for eco-industries'*;
- Creation of global markets for low carbon and energy efficient technologies, products and services: *'global environment and climate change initiatives'*.

The current EU Action Plan for sustainable consumption and production (SCP) and sustainable industrial policy (SIP)[51] is built on a core of actions aimed at improving the energy and environmental performance of products and foster their uptake by consumers. This includes initiatives for eco-design, for eco-labelling, and the promotion of green public procurement, while at the same time withdrawing entitlement to EU incentives for products below a certain level of energy or environmental performance. These actions are to be combined with (as yet undefined) initiatives to support eco-industries through addressing market failures and regulatory barriers. From the broader international perspective, the Action Plan offers support for (voluntary) sectoral approaches to limit emissions, for the promotion of international 'best practices' for sustainable consumption and production, and for the promotion through international negotiations of trade in environmentally friendly goods and services.

Concerning EU policies directed towards improving the energy efficiency and environmental impact of production processes, a more regulatory approach is encapsulated in measures such as the Integrated Pollution Prevention and Control (IPPC) Directive[52] and the Greenhouse Gas Emissions Trading System (EU-ETS)[53]. Recent amendments to EU-ETS[54] and directives on carbon capture and storage (CCS)[55] and on renewable energy sources[56] are all part of a wider package of initiatives and reforms directed towards meeting the EU's target of reducing its overall emissions by 20% below 1990 levels by 2020.

[48] Council of the European Union DOC 10117/06
[49] COM(2009)400
[50] COM(2007)374
[51] COM(2008)397
[52] Directive 2008/1/EC
[53] Directive 2003/87/EC
[54] Directive 2009/29/EC
[55] Directive 2009/31/EC
[56] Directive 2009/28/EC