II

(Preparatory Acts)

EUROPEAN ECONOMIC AND SOCIAL COMMITTEE

429TH PLENARY SESSION, HELD ON 13 AND 14 SEPTEMBER 2006

Opinion of the European Economic and Social Committee on Sustainable development as a driving force for industrial change

(2006/C 318/01)

On 14 July 2005 the European Economic and Social Committee, acting under Rule 29(2) of its Rules of Procedure, decided to draw up an opinion on Sustainable development as a driving force for industrial change.

The Consultative Commission on Industrial Change, which was responsible for preparing the Committee's work on the subject, adopted its opinion on 31 August 2006. The rapporteur was Mr Siecker and the co-rapporteur was Mr Činčera.

At its 429th plenary session, held on 13 and 14 September 2006 (meeting of 14 September), the European Economic and Social Committee adopted the following opinion by 98 votes to 11 with 11 abstentions.

Part 1: Summary of the EESC's conclusions and recommendations

A. In January 2003 the EESC adopted an own-initiative opinion entitled Industrial change: current situation and prospects — An overall approach. The goal of that opinion was not only to provide an overview of the most pressing industrial change issues and trends, but also to highlight the role of the CCMI and its future work. Among the areas of responsibility assigned to the CCMI in this context the following were to be found:

— ‘analysing industrial change and its causes from the economic, social, territorial and environmental points of view, as well as assessing the impact of industrial change on sectors, firms, workforces, territories and the environment.’

— seeking common approaches to promoting sustainable development […]’

The abovementioned opinion also stressed the need to ‘combine competitiveness with sustainable development and social and territorial cohesion’ in keeping with the Lisbon strategy. Moreover, it proposed a working concept of ‘industrial change’ that embraced both the developments affecting companies and the interaction of these with their environment.

So far, the CCMI has focused mainly on assessing the impact of industrial change on sectors, firms, employees, territories and the environment. The aim of the present own-initiative opinion is to examine how sustainable development can be a catalyst for industrial change.

B. That same opinion concluded that change in the European industrial sector has often been approached from the restructuring angle but that it is a much more dynamic concept. The business world is closely linked to the European political and social environment in which it develops and which, in turn, influences the process of industrial change. Fundamental industrial change comes about in two ways: through radical action and through gradual adaptation. Precisely, the aim of this own-initiative opinion is to consider how sustainable development as Brundtland defined it (a development that meets the needs of today without endangering the supply of the needs of future generations) can act as a catalyst for gradual and proactive industrial change.

C. The opinion provides, in the main, examples from the energy and related sectors but the same processes as described here can be applied to others. The reasons for this choice of sectors are several:

— the Brundtland definition of sustainable development implies the need to move towards renewable natural resources;
— energy is a cross-sector issue;

— lessons to be learned from the introduction of new technologies in this field may be extrapolated to other sectors;

— the 25 Member States currently import about 50% of their required oil and gas; this could rise to 70% by 2030, at which time the Commission predicts most suppliers will hail from 'geopolitically uncertain zones'.

D. The moment when a particular technology becomes available is determined by R&D. The moment when it is actually put in use is determined by the market, however. The gap between the two can also be influenced by politics. Thanks to a balanced mix of policy measures — subsidies, promotion, taxes — business in Sweden and Japan began at an early stage with the technological development of heat pumps and solar panels respectively. Partly as a result of this, these countries have succeeded in building a market-leading position.

E. The EESC reaffirms that the three pillars of the Lisbon strategy are of equal importance. However, it is often stressed that there is scope for environmental and social considerations only against a background of a healthy, growing economy. That is an overly simplistic explanation of the strategy as the reverse is also the case. Certainly there is no scope for a healthy, growing economy against a background of a sick environment or of a society driven by social dissent. The Committee welcomes the actions that have been taken in this field and which are described in Annex 2 of the Commission Communication on the Review of the Sustainable Development Strategy — A platform for action (1).

F. Sustainability is not just one of the options on a list; rather, it constitutes the only possible course of action in order to secure a viable future. The concept of 'sustainability' is an overarching one and is therefore not restricted to the environment, but also embraces economic and social sustainability issues. Continuity of a business is a form of economic sustainability which can best be achieved by maintaining profitability. Europe can contribute to this by strengthening competitiveness through innovation and by stimulating research and development through active policy and a mix of targeted measures (see, for example, Sweden and Japan).

G. Social sustainability means allowing people to live healthy lives and to generate an income while guaranteeing a reasonable level of social security to those who are not able to do likewise. The EESC maintains that Europe can contribute in this area by striving for a society that enables people to maintain their vocational skills, by offering them decent work in a safe and healthy working environment and in a climate where there is room for both workers' rights and fruitful social dialogue.

H. The eco-industry offers a lot of opportunity for economic growth. Europe has a strong position in a number of sectors in this industry. In order to retain and develop its strengths and to achieve similar positions in other sectors, the EESC feels that Europe has to display greater ambition.

I. An industrial policy directed at sustainable development can contribute to the competitiveness of the entire European economy, including not only to the new rising sectors, but also to the traditional industrial sectors. The EESC wants the European Commission to support such a policy. Examples described in this opinion show that well thought-out and implemented support schemes (combination of taxation, feed-in tariffs, promotion and regulation) during the introduction of new environmental technologies can help to create a market for these technologies that can then be developed further without support. Any support mechanism must be clearly degressive as the cost of state aid should not restrict the international competitiveness of other industries.

J. The EESC notes that subsidies and incentives are not always efficient and can incur large financial costs with little economic effect if used improperly. Subsidies and regulations should help the market start up and develop initially until the technology is ripe to permit survival without any support. The key factors of successful support are as follows:

— right duration;

— proper specification;

— degressive in time;

— announced well in advance;

— cooperation between government and private sector.

K. Sustainable development is not to be limited to a European context, as it has a global dimension. European sustainability policy should be endowed with instruments to prevent reallocation of labour to other regions. In order to ensure a level playing field, a two-pronged approach is needed: internally to the EU on the one hand and externally to the EU on the other. Regarding the former, appropriate instruments should be introduced to ensure that social and environmental costs resulting from non-sustainable production methods within the European Union be internalised in the price of goods to promote the main thrust of the report of the World Commission on the Social Dimension of Globalisation for policy coherence amongst the ILO, WTO, IMF and World Bank (see CESE

In terms of the latter, the EU should make every effort in relevant international fora (in particular WTO) to include non-trade concerns such as fundamental social and environmental standards into international agreements on trade to facilitate the upgrading of the sustainability policies of Europe’s competitors. Countries such as the United States, India and China have an unfair economical advantage compared to Europe as long as they are not bound by the Kyoto protocol’s CO₂ reduction targets. Those agreements should be implemented on a global scale as trade can only be really free when it is also fair.

Part 2: Arguments to support the opinion

1. Overview

1.1 Our economy is currently based on the availability of cheap energy and raw materials. But supplies are finite, which is partly why they are becoming considerably more expensive. Structural and technological change which are possible, are needed and Europe has to contribute to that change so as to help European industry to meet that challenge. Sectors which involve high levels of consumption of energy and raw materials have to turn to more sustainable production in the future in order to reduce the drain on natural resources. Because these sectors will still be needed in the future as the production of starting and semi-manufactured materials is the basis of industrial value.

1.2 Sustainably producing European energy-intensive industries which compete internationally must not be forced out of the market by competitors from outside the EU using less sustainable production methods. To prevent this occurring a level playing field must be created for those sectors in cooperation between civil society and government.

1.3 The greatest challenge confronting us is the development of a sustainable society which can maintain the present level of prosperity and at the same time neutralise the negative side-effects of current patterns of consumption. One of the main conditions for this is that we learn to cover our energy needs differently and transition to a different form of industrial production.

1.4 The need for gradual transition to a more sustainable model of society is beyond dispute. There are several reasons for that requirement. Experts differ on the period of time fossil fuels will be available for a reasonable price, but everyone agrees that they will become increasingly rare and expensive. In addition, and due to our consumption habits we are facing one of the greatest threats of our age: climate change.

1.5 Ideally, the best way to stop these processes would be to stop burning fossil fuels as we are at present. However, in the short term this is both politically and economically impossible. We have to adopt other approaches, for something has to change — if not as fast as desirable, then at least as fast as possible.

1.6 By applying the trias energetica (2), a model whereby more efficient energy use can be stimulated in three steps, a start can be made in the short term on moving towards more sustainable consumption and production. These steps are:

— reducing demand for energy through more efficient consumption;

— making maximum use of sustainable, renewable energy sources;

— applying efficient technologies that enable the use of remaining fossil fuels in a cleaner way.

1.7 For this a package of measures is needed both to put these three objectives into effect and to bring about a switch to more sustainable industrial production. These measures must be based on an economic and strategic calculation. When making such calculations, there inevitably comes a time when choices have to be made between conflicting interests. We must not avoid these conflicts. So-called ‘win-win situations’ do exist and policies should always be directed towards their creation, but, in practice, that can be very hard. In such a case, choices have to be made between opportunities for sustainable change and the protection of existing interests, taking into account the natural rise and decline of any one sector over another. Such existing and conflicting interests should be made transparent and addressed.

1.8 The concept of sustainability dictates that economic, environmental and social aspects of the development of European society are equally important. This opinion will:

— focus primarily on renewable energy sources and the striving for energy and raw-material efficiency (chapters 2 & 3);

— look at the opportunities of sustainable development in a selection of sectors (chapter 4);

— address a number of the social aspects (chapter 5).

(2) Energy triad — an approach to energy sustainability developed by Delft University of Technology.
2. Renewable energy sources

2.1 Introduction

2.1.1 Every year the Earth absorbs 3 million exajoules (EJ) of solar energy. Total reserves of fossil fuels amount to 300 000 EJ, 10% of total annual insolation. Total annual energy use is 400 EJ. The 3 million EJ of energy absorbed are available in the form of 90 EJ of hydroelectric power, 630 EJ of wind energy and 1 250 EJ of biomass. The rest is available as solar energy (\(^1\)). Thus, in fact there is enough sustainable energy to cover our needs. Accessing it is the problem.

2.1.2 As, given the cost aspect and the lack of appropriate technology, renewable energy sources will not be able to meet rising energy demand in the short term, other energy sources will be needed. There is potential for fossil fuels to be used cleanly, for example by removing the CO\(_2\) and subsequently storing it to prevent its release into the atmosphere. The development of technology for capturing and storing CO\(_2\) is in full swing: a dozen or so pilot installations are already either in the startup phase or under construction in Europe, North America and China. The use of this technology can be expected to break even as early as 2015/2020.

2.1.3 The duration of support schemes for renewable energy is crucial, as premature withdrawal may jeopardise the new industry, and on the other hand, prolonged support is not efficient. Typically, support can be gradually phased out, as R&D and economies of scale push the price of the technology lower. Proper specification of the support scheme is also of high importance. Finally, it is important that support schemes be announced in advance so that business has time to prepare for the new market conditions.

2.1.4 The nuclear energy debate is becoming increasingly important, as is shown by the Green Paper on a European Strategy for Sustainable, Competitive and Secure Energy (\(^2\)) and the Conclusions of the March 2006 European Council on this subject. In some countries there is a majority in favour of nuclear energy, in others a majority against — mainly because of the waste problem (\(^3\)). Nonetheless, nuclear power will for some considerable time continue to be indispensable for meeting strongly growing energy demand, as it is an emission-free energy source and as the volume of waste is relatively low by comparison with the energy generated. In the long term nuclear fusion may provide a solution to the drawbacks of nuclear fission.

2.1.5 It should be noted that hydro-electric power sources do not form a specific paragraph, as this technology (apart from tidal energy) is considered both fully-fledged and fully operational. This should not be seen as detracting in any shape or form from its importance in the sustainability context.

2.2 Biomass

2.2.1 Biomass is organic material from plants and trees specially cultivated for energy purposes. Wood and fast-growing crops are used with a high yield per hectare. By-products from agriculture, the main emphasis being on food, are also used as biomass. Examples are straw and sugar beet crowns. Biomass streams can also be obtained from residues, e.g. waste arising from planting and maintenance and in households, businesses and industry. Examples are fruit, vegetable, and garden refuse, waste timber, manure, slurry, sawdust and cacao shells.

2.2.2 Biomass can be used to (partially) replace fossil fuels. Annual consumption of fossil fuel energy is 400 EJ. Annual availability of biomass energy is 1,250 EJ. But this does not mean that an immediate switch is possible. On the basis of available technology it is currently possible to produce 120 EJ of energy from biomass. Current world consumption of biomass energy is 50 EJ (\(^4\)). A limited increase in the use of biomass for fuels is therefore possible in the short term, but technological breakthroughs will be needed to enable the potential to be exploited.

2.2.3 A number of initiatives have produced promising results. In Austria there has been a sixfold increase in the use of biomass for district heating, and in Sweden an eightfold increase has been achieved over the last ten years. In the USA more than 8,000 MW of the installed generation capacity is based on the use of biomass. In France 5% of energy used for heating is produced from biomass. In Finland bioenergy already accounts for 18% of total energy production and the aim is to increase this to 28% by 2025. In Brazil ethanol is produced on a large scale as a fuel for cars, currently ethanol provides roughly 40 percent of Brazil’s non-diesel fuels (\(^5\)).

2.2.4 The development of biomass is important from a number of points of view:

a. Environmental policy: the life cycle of biomass as a renewable material has a neutral effect on CO\(_2\) and SO\(_2\) emissions. Moreover, when biomass is used on a large scale it is possible to close the mineral and nitrogen cycles.

\(^{1}\) Source: Energie Centrum Nederland, www.ecn.nl.
\(^{3}\) Eurobarometer issues 227 (on nuclear energy and waste, June 2005) and 247 (Attitudes towards Energy, January 2006).
\(^{5}\) www.worldwatch.org.
b. Agricultural policy: in Europe agricultural land has been taken out of production. It is estimated that 200 million hectares of agricultural land and 10 to 20 million hectares of marginally productive land could be used for the production of biomass as a source of raw materials and energy. The need for more extensive agricultural production must be seen against the backdrop of the need to preserve Europe’s rich landscapes, achieve the EU’s objective of halting the loss of biodiversity and ensuring sufficient area is set aside for nature protection. Appropriate account of balance in all these areas will need to be taken.

c. Social policy: in global terms 11 new jobs are created for every megawatt of installed production capacity. If the use of biomass as an energy source in Europe were to rise from 4% of energy needs in 2003 to around 10% in 2010 (1), this would mean 160 000 new jobs.

d. Regional policy: biomass can be used as a decentralised source of energy where conversion takes place close to the production site by means of small-scale power generation plants. This can promote social stability at regional level, particularly in economically disadvantaged areas.

e. The requirement to produce green electricity: a European directive requires European electricity producers to produce a certain percentage of their electricity from renewable energy sources. This percentage varies from country to country, but is rising steadily. Provision is made for penalties (or the withdrawal of subsidies) if the percentage targets are not met. Clearly, the production of electricity from biomass, either on its own or by burning it together with coal, will make a significant contribution to meeting the targets for green electricity.

2.3 Wind energy

2.3.1 Worldwide the theoretical potential of wind energy is more than twice forecast electricity needs in 2020. This potential and its steadily improving competitive position as a result of technological advances make wind energy an essential replacement for fossil fuels. Wind energy can never cover all needs because of its fluctuating supply.

2.3.2 Over the last few decades installed generation capacity using wind energy has increased spectacularly. The capacity of commercial turbines has grown from 10 KW (rotor diameter 5m) to more than 4 500 KW (rotor diameter more than 120 m). (2). Over the last eight years installed generation capacity using wind energy has grown at an annual rate of more than 30% (3). According to projections by the European Wind Energy Association (EWEA), total wind energy capacity will be sufficient in 2020 to cover 12% of electricity needs. This implies an increase in wind energy capacity from 31 GW at the end of 2002 to 1 260 GW in 2020, growth of 23% per year. The market leaders and biggest exporters are the United Kingdom, Denmark and Germany, and the main export markets are China, India and Brazil. The situation is going to change in China where the wind energy machinery industry is growing rapidly. Compared to 2004 the number of producers in China grew by 60% in 2005. This implies that the European wind machinery industry may face the same scenario as the solar panel industry and lose massive market share to its Chinese competitors.

2.3.3 The wind energy sector is still to some extent dependent on various support measures. The most important of these is the price which producers receive for the energy they sell to the grid, together with the certainty of a guaranteed price level for the next ten to twenty years. Thanks to these measures the wind energy sector is a fast-growing industry in some Member States. The disadvantage is that these measures lead to large, centralised wind energy parks making large profits rather than a fine-meshed network of small, decentralised wind energy power plants. Public opinion is increasingly turning against this large-scale phenomenon. Of course at the end of the day wind energy also has to be able to survive on its own without subsidies and feed-in tariffs.

2.3.4 The research and development effort needs to be stepped up in order to further improve the competitive position of wind energy. Constant attention also needs to be paid to legal guidelines and political objectives. Further major challenges are posed by the development of new locations for wind parks at sea and the elimination of uncertainties regarding the implementation of wind energy.

2.3.5 The development of wind energy is important from a number of points of view.

a. Environmental policy: wind energy is a clean form of energy without emission of CO2 or other pollutants. Its availability fluctuates but is enormous.

b. Social policy: in 2002 wind energy contributed to employment to the tune of 20 jobs per megawatt of installed capacity. However, as a result of learning effects in the design, manufacture and installation of turbines, employment is not increasing in proportion and the employment impact is expected to fall to 9.8 jobs per megawatt of installed capacity in 2020. This means that employment in the wind energy industry will increase from around 114 000 jobs in 2001 to some 1.47 million jobs in 2020 (4).

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c. Regional policy due to the support schemes wind energy develops into large, centralised wind energy parks. Because of their profits they are very attractive for investors. The public opinion is turning against this development as it is in favour of fine meshed networks of small, decentralised wind energy power plants.

2.4 Solar energy

2.4.1 There are two ways of using solar energy: to provide heating and hot water, and to produce electricity (\(^{12}\)). Solar heating systems are relatively simple and cheap and are already used in many countries.

2.4.2 The main reason to aim for the large-scale use of solar energy is the fact that it is inexhaustible. It has enormous potential worldwide and is, providing it is well designed and constructed, very environmentally friendly.

2.4.3 Solar energy can be harnessed almost anywhere in the world in the variety of ways: from very small systems in remote places through solar panels on the roofs of houses to large solar power generation plants.

2.4.4 Solar heating systems are in widespread use. The largest market for these systems is China, mainly because gas and electricity distribution infrastructure is lacking in rural areas. In such cases solar energy is the most efficient solution. Another large market is Turkey. Between 2001 and 2004 the worldwide sale of solar panels grew by between 10 and 15 % annually. China took 78 % of total world production and Turkey 5.5 %.

2.4.5 In Europe, Germany, Austria, Spain and Greece are major markets for solar heating systems. The governments of Germany and Austria offer financial incentives for the installation of such systems. In some regions of Spain the installation of such systems in new buildings is compulsory. As a result of these support measures Germany and Austria are by far the largest producers of solar heating systems in Europe and account for 75 % of European production. This pales into insignificance, however, compared with the production of such systems in China. Europe has produced 0.8 million m\(^2\) and China 12 million m\(^2\). The main reason for this is that the Chinese government recognised the importance of solar heating early on and stimulated the production of these systems with a variety of measures in its five-year plans.

2.4.6 Despite its inexhaustibility, solar-generated electricity at present accounts for only a small proportion of our requirements. This is because the cost of solar generation is still considerably higher than electricity from gas or coal-fired power plants. In order to break the vicious circle of low use and high prices solar energy should be used as much as possible as this will lead to major economies of scale in production and installation. And only then can the technology be further renewed and improved.

2.4.7 Moreover, the generation of electricity using relatively small units of variable yield (depending on the sun) requires a different approach to energy than hitherto. The switch to solar energy is something for the medium term, but it is very important that development in the sector be strongly promoted.

2.4.8 Although the photovoltaic (PV) market is growing rapidly, there are in fact only three major markets: Japan, Germany and California. These three areas account for 80 % of global production of solar energy systems. This is encouraged by high subsidies and by paying households a good price for electricity generated in this way. Worldwide production of solar cells in 2004 was equivalent to generating capacity of 1 150 MW. Adding this to the approximately 3 000 MW of generating capacity already installed at the end of 2003 means that in 2005 total capacity grew to around 4 500 MW.

2.4.9 The Japanese market was created in 1994 by a programme of incentives involving 50 % subsidies. The subsidy was reduced by 5 % each year and 2004 was the last year of the programme, in which a 5 % subsidy was available. As the programme created significant demand, Japanese industry benefited from economies of scale. Prices fell each year by 5 %, which kept the consumer price stable. Although the subsidy is no longer available, the market continues to grow at about 20 % annually. This stable demand made it possible for Japanese companies to invest in R&D and in new manufacturing technologies. As a result Japan currently accounts for some 53 % of the world market.

2.4.10 Germany has gone through a similar process, but about five years behind, beginning in 1999. A combination of low-interest loans, subsidies and stable prices for the sale of electricity to the grid resulted in rapid growth of the PV market. As early as 2001 Germany overtook the USA in terms of installed capacity. Local producers developed and half European production (13 % of world production) now comes from Germany. The launch of a new support programme in 2004, with stable purchase prices for electricity guaranteed for the next 20 years, has given the process a new impetus. The German market is now the fastest growing in the world, some 40 % in 2004 and 2005. This domestic demand makes it possible for German manufacturers to develop their production and to switch production to export markets once the domestic market begins to be saturated.

\(^{12}\) See Appendix I.
2.4.11 The development of solar energy is important from a number of points of view.

a. Environmental policy: solar energy is a clean form of energy without emission of CO₂ or other pollutants. Its potential is enormous, as every year the earth absorbs 3 million exajoules (EJ) of solar energy. In comparison, the total reserves of fossil fuels is estimated at 300 000 EJ.

b. Social policy: the development of solar energy will create jobs in designing, improving, producing and installing solar energy systems. On the other hand, jobs will be lost as less big centralised power plants will be needed.

c. Regional policy: solar thermal energy can be used in distant, poor areas where there is no infrastructure for the distribution of energy. It is a cheap solution for heating and for the supply of hot water.

2.5 Geothermal energy

2.5.1 Geothermal energy can be used by means of heat pumps for heating and cooling buildings. These pumps use only a fraction of the quantity of gas or electricity used by conventional heating/cooling systems. The energy used for heating (or cooling) is taken from the environment (air, water or earth) (13).

2.5.2 The largest markets for heat pumps are the USA, Japan and Sweden, which together account for 76 % of total installed capacity. They are followed by China, France, Germany, Switzerland and Austria. The European market has grown from 40 000 units in 1997 to 123 000 units in 2004. The total market grew by 18 % in 2004. The manufacture and installation of heat pumps is concentrated in countries where governments offered strong financial and other incentives.

2.5.3 Sweden is a good example of this approach. The Swedish government has encouraged the use of heat pumps since the 1990s with measures such as direct financial subsidies, tax breaks and promotional activities. But new legislation applicable to the construction sector laying down detailed temperature requirements for heating systems also contributed to the growth in the use of heat pumps.

2.5.4 In this way a market was created in Sweden for the manufacture of heat pumps. The country now has an established heat pump industry, with three major players on the global market and 50 % of European demand. The Swedish heat pump market is now self-sustaining. The number of heat pumps in use is growing steadily, even without government support measures. More than 90 % of new buildings in Sweden are now equipped with a heat pump.

2.5.5 A similar development has taken place in Austria, where regional government subsidies equivalent to 30 % of the cost of purchasing and installing heat pumps have been available. Austria now has seven heat pump manufacturers. In both countries it was the combination of direct financial support, building regulations and promotional campaigns which ensured that a heat pump industry could develop which is now able to operate without support.

2.5.6 The development of geothermal energy is important from a number of points of view.

a. Environmental policy: geothermal energy is an inexhaustible, clean and energy saving energy source. Its potential is enormous, as the outer 6 kilometres of the earth's crust stores energy that amounts up to 50 000 times that of all known the known oil and gas stocks in the world (14).

b. Social policy: the development of geothermal energy will create jobs in designing, improving, producing and installing geothermal energy systems. On the other hand, jobs will be lost as less big centralised power plants will be needed.

c. Regional policy: geothermal thermal energy offers people in distant areas without any infrastructure for the distribution of energy a cheap solution to provide in their own need of heating and hot water. Electricity is required in order to exploit geothermal energy, but significantly less than is required for direct heating and hot water supply.

3. Raw material efficiency

3.1 It is not only energy from fossil fuels which is finite, but also reserves of metallic, mineral and biological raw materials for industrial production (15). There is extensive use of raw materials in the industrialised world: 20 % of the world's population consumes more than 80 % of all raw materials.

3.2 This consumption pattern is incompatible with the sustainable use of the natural resources available to us. Based on the assumption that reserves of raw materials are our common heritage and that current and future access to them is a universal and inalienable right, Europe will have to reduce its use of raw materials fourfold by 2050 and tenfold by 2080 (16). The EESC is satisfied with the initiatives in this field like dematerialisation and the Environmental Technology Action Plan (ETAP).

(13) See Appendix II.
(14) Source: Informatiecentrum Duurzame Energie.
(15) See EESC opinion entitled Risks and problems associated with the supply of raw materials to European industry.
3.3 In the final analysis, every product involves damage to the environment: whether during production, use or disposal at the end of its life cycle. The cycle has many phases: the extraction of raw materials, design, production, assembly, marketing, distribution, sale, consumption and disposal. At each stage different players are involved: designers, manufacturers, dealers, consumers, and so on. An integrated production policy attempts to improve coordination of these phases (for example by taking optimum recycling into consideration at the design stage) in order to enhance the environmental performance of the product throughout its life cycle.

3.4 With so many different products and players involved, it is not possible to draw up one uniform measure that solves all problems. A whole array of policy instruments is required, both voluntary and binding. These instruments have to be implemented in close cooperation with the public and private sectors and with civil society.

3.5 Consumer organisations should also play a more stimulating and supporting role than hitherto. Up until now, many of these organisations have focused mainly on obtaining the best possible product for the lowest possible price. In practice this means that production is not achieved in the most sustainable way.

3.6 Combined heat and power (CHP)

3.6.1 Using the heat produced in the process of generating electricity means a sharp improvement in the efficiency of energy use, despite the technical limitations arising from the distance between the place where the heat is produced (industrial environment) and the place where it is consumed (in the home), which causes a great deal of energy to be lost. Micro-CHP units can operate primarily to meet thermal needs of a building with electricity as a by-product. Alternative products can be configured for electricity demand first with heat as a by-product. Most sales to date have been heat-led micro-CHP, although fuel cells are more commonly configured to satisfying electricity demand.

3.6.2 CHP technology can circumvent this limitation, and at the same time it offers an economic challenge for European industry. CHP is mainly used to heat residential housing and shops and it produces electricity as a by-product. By 2004 some 24 000 units had been installed. CHP can be used with various energy sources. The most promising of these is hydrogen (fuel cell) technology, but this technology first needs to be further developed.

3.6.3 Thanks to subsidies for end users of CHP plant, Japan has made the most progress in developing this technology, partly because fuel cell technology is being strongly promoted there by the automotive industry. The Japanese government wants Japanese industry to develop a leading position in fuel cell technology, as it has already done in solar energy. To this end Japan is promoting and financing research and development and providing purchase subsidies to end users at an early stage of market development.

3.6.4 The development of CHP is important from a number of points of view:

a. Environmental policy: it is a cheap and energy-saving energy source. On top of that it is very clean, hot water and power produced with CHP leads to 20 % less emission of CO₂.

b. Social policy: the development of CHP will create jobs in designing, improving, producing and installing CHP systems. On the other hand, jobs will be lost as less big centralised power plants will be needed.

4. Implications of sustainability for a range of sectors

The growth of sectors engaged in research and development in the field of renewable energy technologies shows that there are considerable economic opportunities in sustainable development. These opportunities do not only exist in those sectors where sustainability technologies are being directly developed but also in those in which new technologies have to be implemented.

4.1 Transport

4.1.1 The transport sector is one of the largest users of fossil fuels. In this sector there are promising opportunities for the sustainable use of energy as the numerous useful recommendations in the CARS 21 final report illustrate (17). In addition, better planning of urban development and infrastructure and more intensive use of ICT technology opens up prospects for improving transport efficiency. Combined with further improved combustion engine technology, this will lead to a substantial energy-saving. In the short term there are also promising opportunities for switching partially to other fuels, such as natural gas or fuel from biomass (BTL). In the longer term hydrogen offers attractive opportunities. The hybrid technology now being developed is also a promising interim solution.

4.1.2 The maximum potential market share of fuel from biomass is estimated at 15 %. The EU has set a target of a 6 % market share by 2010. An initial pilot project for producing fuel from biomass on a large scale is already up and running.

(17) CARS 21 High Level Group: Competitive Automotive Regulatory System for the 21st century.
4.1.3 Natural gas produces lower CO₂ emissions than either petrol (-16 %) or diesel (-13 %) and could take a larger market share given a favourable tax regime. In that way a stable market could develop for both producers and users. The technology is already there. The opportunities are particularly great in relation to urban public transport, as this would enable optimum use to be made of gas filling stations. A 10 % market share would be possible by 2020 (19).

4.1.4 Examples in other countries (particularly Brazil) show that this kind of market share cannot be achieved merely by ensuring that bio-fuel is available. Flanking policies—such as tax incentives, targeted legislation and regulation and promotion—are needed to encourage the consumer to make the switch.

4.1.5 Another side of the coin is that increased use of bio-fuels originating from environmentally sensitive areas (such as palm-oil from South-East Asia) may lead to a large scale destruction of rainforests as these are replaced by palm-oil plantations. The world knows 23 big ecosystems, 15 of which are exhausted or heavily polluted according to a recent study by the United Nations.

4.2 Construction

4.2.1 In construction — e.g. housing — there is enormous potential for more sustainable techniques. It is already possible to build zero-energy houses at little additional cost, particularly considering that any additional costs are quickly recovered from energy savings. Building in this way costs on average 8 % more than traditional construction methods. Economies of scale could narrow the gap to 4 % within ten years. Norman Foster, one of the world’s most famous architects, once stated that, if you look at the total costs of a building over a period of 25 years, the actual building costs are only 5.5 %. The costs of occupying the building (energy, large- and small-scale maintenance, interest rate on mortgage/lease) account for up to 86 % over that same period of time. So, while building in a sustainable way may be slightly more expensive in the short term, it is considerably cheaper in the medium to long term.

4.2.2 In Germany and Austria energy-efficient construction is growing faster than in the rest of Europe. The Passiv Haus Institut in Germany has commissioned housing designs which use very little energy by using solar energy in combination with efficient, air-tight insulation. More than 4 000 houses of this type have now been built in Germany and more than 1 000 in Austria. The principle is also increasingly being used in the construction of commercial buildings.

4.2.3 The municipality of Freiburg has laid down new rules on energy-efficient construction. These rules are an integral part of every lease or purchase agreement which the local authority enters into with builders and property developers. In this way the local authority is making optimum use of its legal powers in order to promote energy management on a large scale. The agreements state that any construction on land purchased or leased from the local authority must be done in accordance with energy-efficiency guidelines; buildings are to be designed to make maximum use of solar energy and roofs must be suited to the installation of solar panels. In areas where buildings are constructed in this way savings of 40 % are achieved on hot water use.

4.3 Industry

4.3.1 The Committee welcomes the Commission’s approach to industrial policy taking account of sustainability concerns, as promulgated in its Communication entitled Implementing the Community Lisbon Programme: A policy framework to strengthen EU manufacturing — towards a more integrated approach for industrial policy (20). The achievement of the Lisbon goals requires a competitive European industry. Therefore the EESC welcomes the setting-up of a High Level Group on Competitiveness, Energy and the Environment, one of the seven major cross-sectoral policy initiatives designed to reinforce the synergies between different policy areas in the light of competitiveness considerations. The Committee also welcomes the efforts made by the European industry itself in this field.

4.3.2 At present, industry remains largely dependent upon fossil fuels. However, in numerous instances the choice of process permits the use of all types of primary energy sources while, in the majority of cases, simultaneously making for energy savings (20). There are also ways of exchanging residual energy between industrial complexes and other sectors or residential complexes. Thus, the residual heat of the Europoort industrial complex is used to heat the largest greenhouse complex in north-western Europe, 20 kilometres away in Westland.

4.3.3 Crude oil is the basis for the chemicals industry but in the future less of it will be available. An alternative is biosynthesis, the production of basic chemicals from biomass using bacteria, a very complex but also promising area. In recent years great deal of progress has been made in relation to our knowledge of the genetic make-up of micro-organisms such as bacteria. New technologies make it possible to modify these organisms genetically so that they convert the original material into specific substances. The bacteria become a sort of programmable mini-reactor.

4.3.4 At present the food and pharmaceuticals industries use this micro-organism technology, e.g. in the production of cheese, beer and penicillin. The opportunities for bioconversion are considerable in these sectors too, but the chemicals industry is now also beginning to take an interest in the technology. A whole series of reaction steps are needed to obtain substances from crude oil and purify them. The technology needs to be developed much further but it is theoretically possible to switch to the direct conversion of biomass into basic chemicals and other products. This will reduce the need to use oil, with all the attendant economic and environmental benefits — emissions reduction, closing of the circuit and management of the chain.

4.3.5 Energy-intensive sectors may encounter particular problems in ensuring gradual transition to renewable energy sources. The level of sustainability of production is a direct function of the level of technology employed and no major improvements in this domain are to be expected in the near future. The steel and aluminium sectors in Europe, for instance, are already performing well in this area. Whereas the steel industry is investing a great deal in new technologies for more sustainable production, especially through the ULCOS project (Ultra Low CO₂ Steelmaking, the largest European steel project ever) and expects CO₂ emissions to be halved by around 2040, the production of primary aluminium in Europe is characterised by a remarkably high-level use of renewable energy (44.7 %). Since the energy used in producing secondary aluminium out of aluminium scrap is only 10 % of the energy needed for the production of primary aluminium there is a major potential for energy saving in this sector. However, aluminium scrap in the European market is being purchased massively by China through governmental incentives aimed at saving energy.

4.3.6 The European steel industry also does well in the field of raw material efficiency and recycling. Half of the world's steel is produced using scrap metal. Optimum use is also made of recycled waste. At the Corus plant at IJmuiden 99 % of waste is re-used either on site or externally.

4.3.7 Although the use of fossil energy sources as a raw material for industrial production will, to a great extent, be unavoidable for the foreseeable future, the use of newly developed materials will help save energy in the applications area, e.g. by reducing weight in vehicle manufacturing. In order to promote such innovation the European industry has to preserve its international competitiveness, beginning with the extractive industries where the value-creation chain starts.

5. Social aspects

5.1 The need for gradual transition to sustainable production is unavoidable and undisputed. Deindustrialisation, the transfer of production to other regions and increasing competition from developing economies has led to uncertainty and fear. In this climate people have tended to believe that switching to more sustainable production will adversely affect Europe's competitiveness, hinder the growth of industry and destroy jobs, and that it is bad for the economy and for employment.

5.2 There have been negative effects on employment in Europe. In Germany studies predict that 27 600 jobs will be lost by 2010 due to the Emissions Trading Scheme (ETS), rising to 34 300 by 2020 (21). Yet another 6 100 jobs will be lost in Germany by 2010 as a result of the implementation of the renewable energy law (22). Finally the implementation of the Kyoto-protocol agreements will have destroyed another 318 000 German jobs by 2010 (26). These figures must be set against the number of jobs created, which shows that a policy geared towards climate protection goals really entails 'industrial change': for example, the EUR 16.4 billion for which the renewable energies sector in Germany accounted in 2005 and the 170 000 jobs that have so far been created in this sector (26). With production amounting to EUR 55 billion (2004), the environment and climate protection sectors in Germany currently provide some 1.5 million jobs and contribute EUR 31 billion to German exports (2003), thus helping to secure many more jobs (26).

5.3 However, the impact is not only negative. A survey of job losses in Europe shows that less than 5 % of jobs lost have disappeared as a result of the transfer of production to other regions (26). In spite of methodological limitations arising from data collection techniques, this survey remains a useful source of information, particularly when taken in tandem with other relevant indicators. It could be argued further that only a small percentage of that job-loss is due to environmental legislation.

5.4 There has also been a growth in jobs. The eco-industry engaged in research and development in the field of sustainable technologies is a dynamic sector which is increasing employment by 5 % annually. This sector, with more than two million direct, full-time jobs, now provides as many jobs in Europe as the pharmaceutical and airspace industries (26).

(22) Gesellschaftliche, sektorale und ökologische Auswirkungen des Erneuerbare-Energien-Gesetzes (ERG), 2004, Energiewirtschaftliches Institut an der Universität zu Köln (EWI, Köln), Institut für Energetik und Umwelt (IE, Leipzig), Rheinisch-Westfälisches Institut für Wirtschaftsforschung (RWI, Essen).
(23) Das Kyoto-Protokoll und die Folgen für Deutschland 2005, Institut für politische Analysen und Strategie (ipas) in cooperation with the International Council for Capital Formation (ICCF).
(24) German Environment Ministry press release No 179/06 of 10.7.2006.
(26) www.emcc.eurowind.eu.int/erm/.
5.5 An OECD study (28) has shown that sustainable production does not by definition lead to higher costs. In the long-term it can even reduce costs to some extent. Moreover, sustainable output can be counterbalanced against these costs. Clear commercial advantages, environmental legislation and ancillary regulation lead to investment in sustainable innovation, encourage more efficient use of raw materials, strengthen brands, improve the image of businesses and ultimately lead to greater profitability and employment. In order to be successful this process needs a common approach based on shared responsibility from business, labour and government.

5.6 To be avoided at all costs is that European industry suffers a significant competitive disadvantage when compared to regions outside the EU due to higher costs resulting from environmental and social laws and regulations. When Europe sets standards for sustainable production for its own industry it is unacceptable and beyond reason if, at the same time, it allows producers from outside the region to bring products to the market that are not produced in compliance with those standards. To stimulate sustainable production a two-pronged approach is needed: internally to the EU on the one hand and externally to the EU on the other.

5.6.1 Regarding the former, appropriate instruments should be introduced to ensure that social and environmental costs resulting from non-sustainable production methods within the European Union be internalised in the price of the goods to promote the main thrust of the report of the World Commission on the Social Dimension of Globalisation for policy coherence among the ILO, WTO, IMF and World Bank, as pointed out in the EESC opinion on ‘The Social Dimension of Globalisation’.

5.6.2 In terms of the latter, the EU should make every effort in relevant international fora (in particular WTO) to include non trade concerns such as fundamental social and environmental standards into international agreements on trade to facilitate the upgrading of the sustainability policies of Europe’s competitors. Countries such as the United States, India and China have an unfair economical advantage compared to Europe as long as they are not bound by the Kyoto protocol’s CO₂ reduction targets. Those agreements should be implemented on a global scale as trade can only be really free when it is also fair.

5.7 The European eco-industry now has roughly a third of the world market and generates a trade surplus of more than EUR 600 million. In 2004 exports grew by 8 %, and this is a growth market because in the future all countries, even China and India, will increasingly switch to sustainable products and production processes.

5.8 The sustainable, innovative society towards which we have to move needs a thorough information campaign aimed at citizens and consumers to raise awareness and to provide a broad social basis. It also needs well-trained workers. In the recent past, Europe paid too little attention to this. The English text of ten European directives in this area (sustainability, innovation) has been scanned for the words ‘training’, ‘learning’, ‘skilling’ and ‘education’, and only the first of these occurred, once, in one directive.

5.9 A number of Commission communications which preceded these directives dealt at length with the need for training. That interest was entirely missing in the directives, however. Communications are just words, whereas directives are deeds. A policy is not what you say, it is what you do. The EESC welcomes the fact that a lot of attention is paid to the importance of education in the new EU industrial policy and encourages the Commission to continue in the same vein.

5.10 In the Lisbon Strategy Europe has set itself the objective of becoming by 2010 the most competitive knowledge-based economy in the world with more and better jobs and greater social cohesion. A well-trained workforce is needed to build and maintain this kind of society. If we do not invest enough in training our workers, not only will we not achieve the Lisbon objectives by 2010. We will never achieve them.


The President of the European Economic and Social Committee Anne-Marie SIGMUND