I

(Resolutions, recommendations and opinions)

OPINIONS

EUROPEAN ECONOMIC AND SOCIAL COMMITTEE

489TH PLENARY SESSION HELD ON 17 AND 18 APRIL 2013

Opinion of the European Economic and Social Committee on 'The economic effects from electricity systems created by increased and intermittent supply from renewable sources' (exploratory opinion)

(2013/C 198/01)

Rapporteur: **Mr WOLF**

On 7 December 2012, the future Irish EU Presidency decided to consult the European Economic and Social Committee, under Article 304 of the Treaty on the Functioning of the European Union, on

The economic effects from electricity systems created by increased and intermittent supply from renewable sources

(exploratory opinion).

The Section for Transport, Energy, Infrastructure and the Information Society, which was responsible for preparing the Committee's work on the subject, adopted its opinion on 3 April 2013.

At its 489th plenary session, held on 17/18 April 2013 (meeting of 17 April), the European Economic and Social Committee adopted the following opinion by 147 votes to 2 with 5 abstentions.

1. **Executive summary**

1.1 The EESC has given strong support to renewable energy sources (RES) in previous opinions and the preparation of the so-called 20/20/20 package.

1.2 The promotion of RES at EU level is intended to reduce energy-related carbon emissions (contributing to Europe's part in climate protection) and import dependency (improving the security of supply).

1.3 The increasing share of intermittent RES has prompted intense debates on the technical and economic consequences of such an increase. Following the request by the Irish Presidency, the EESC aims to provide more clarity and transparency on that issue.

1.4 Beyond a certain share of the energy mix, intermittent RES require additional components of the energy system to be put in place: grid extensions, facilities for storage, reserve capacities and efforts towards flexible use. The Committee therefore recommends that significant impetus be given to developing and installing these missing elements.

1.5 Should these components not yet be available, either the energy output cannot be used from time to time, or networks and control systems can be overloaded from time to time. The consequences would be inefficient use of the installed facilities, as well as threats to the security of energy supply and to a viable European energy market.

1.6 Feed-in rules for RES are therefore to be carefully (re)defined, in order to provide for security of supply at all times and ensure that renewable electricity production can meet demand.

1.7 Expanding production facilities for intermittent renewable energies still further requires substantial investments to develop and operate the missing components of the complete system. In particular, the development and installation of sufficient overall storage capacity represent a challenge, a chance and an absolute necessity.

1.8 As a result, increased use of intermittent renewable energy technologies may well lead to a further considerable rise in costs for electricity, which, if passed on to consumers, could result in a severalfold increase in electricity prices.

1.9 A sustainable energy system comprising largely renewables, although carrying additional costs compared with current fossil-based systems, is the only long-term solution for our energy future. It should also be noted that cost rises are inevitable, due to the agreement to include external costs and stop subsidies attached to fossil-based energy.

1.10 The Committee therefore recommends that the Commission order an appropriate, thorough economic study on the issue covered by this opinion. This study should take a quantitative look at the unanswered questions.

1.11 Other economic repercussions following this cost increase could be (i) potential damage to the competitiveness of European industry, and (ii) a greater burden on socially disadvantaged groups in particular.

1.12 Consequently, there is a risk of more manufacturing relocating to non-EU countries where energy is cheaper. Not only could this fail to combat climate change (carbon leakage), it would also undermine Europe's economy and prosperity.

1.13 Since additional further costs may arise from inappropriate subsidies and incentives varying from one European country to another, the whole cost issue, including alternative energy strategies, needs to be openly and transparently discussed, also addressing the question of the external costs of the various energy systems and their interdependence.

1.14 As a consequence, a common European energy policy and internal energy market are needed. This could provide the basis for a reliable legislative framework inspiring confidence and enabling energy investments and Europe-wide systems – the overarching objective of efforts to build a European Energy Community.

1.15 An effective and more market-oriented support instrument serving environmental, social and economic objectives, reflecting possible external costs and covering the whole EU is needed to enable renewable energy technologies to compete on free markets.

1.16 Appropriate carbon pricing could be used to this end (e.g. a tax). The Committee recommends that the Commission, together with the Member States, develop appropriate policy initiatives for such a support instrument. All other instruments supporting market penetration of various energy sources could then be abolished.

1.17 The global character of the climate problem and international economic integration require a stronger focus on the international economic situation and global carbon emissions. Global agreements on climate protection are therefore of vital importance.

1.18 An important element of the further procedure would be the establishment of a public dialogue – European Energy Dialogue – about energy across Europe as outlined in the proposal recently adopted by the Committee and welcomed by the European Commission. Eventually, a study on the impact of the Roadmap 2050 on the EU economy and its global competitiveness is needed, before making final decisions with long term impacts.

2. **Introduction**

2.1 The Committee welcomes the request by the Irish presidency, which addresses a serious problem – a problem that still needs to be solved if the objective of the Energy Roadmap 2050 is to be achieved. The EESC has given its strong support to renewable energy sources (RES) in its previous opinions and the preparation of the so-called 20/20/20 package.

2.2 Moreover, the Committee has discussed issues related to the subject of this opinion, most recently in its opinion on *Integration of renewable energy into the energy market* (CESE 1880/2012). The Committee has called for further installation of facilities to convert renewable energy sources into electrical energy, albeit in the framework of a balanced energy mix. It has recommended a stronger focus on economic and social aspects and on curbing rising costs, above all through appropriate carbon pricing, which should be the only support instrument used. The present opinion follows the same basic line.

2.3 With regard to the context and starting points of this opinion, it should also be pointed out that:

— So far, international efforts to prevent a further increase in global CO_2 emissions have in effect failed (Dieter Helm, The Carbon Crunch, Yale University Press, 2012); levels in excess of the 400 ppm threshold are not far off.

— Energy – increasingly in the form of electrical energy – is the lifeblood of today's society. A sustained blackout would have very serious consequences (*Was bei einem Black-out geschieht, Studien des Büros für Technikfolgen-Abschätzung beim Deutschen Bundestag* (What happens when there is a blackout, studies of the German Parliament's Department for Technical Impact Assessments), 2011).

— For this reason, the security of energy supply must be given at least as important a priority as other energy policy criteria.

— The February 2011 European Council confirmed the EU's objective of cutting greenhouse gas emissions by 80-95% compared to 1990 levels by 2050 as Europe's contribution to climate protection. In the Commission's *Roadmap for moving to a competitive low carbon economy in 2050* (COM(2011) 112 final) this objective translates into a reduction to a mere 5% of the reference value in the electricity sector.

— In order to meet the final objective of the Energy Roadmap 2050, and respecting the frame of the renewable energy directive, renewables will have to take up that share of energy production in the energy mix defined by each Member State not covered by nuclear energy or power stations using CCS.

— The main problem of currently dominant renewable energy sources such as wind and solar energy are major fluctuations in energy output, which cannot provide secured capacity (Friedrich Wagner, Features of an electricity supply system based on variable input, Max Planck Institute for Plasma Physics, 2012). This is already beginning to cause visible problems, attracting public debate and political and media attention.

3. **The issue of costs**

3.1 The key economic issue facing any energy supply system is the costs of developing and operating the complete system – from energy producers to consumers – and their impact on economic capacity, competitiveness and social sustainability.

3.2 Over the last years, costs have grown significantly in all energy supply sectors. This applies to fossil fuel sources such as oil or gas (with increases aggravated by taxes and other charges), to new nuclear power stations due to significant extra costs arising from safety systems, and particularly also to renewable energy sources due to the substantial subsidies and support mechanisms needed for them to achieve market penetration. In addition, in the complete system there are indirect costs arising from grid development, regulating energy, backup capacity, as well as external costs, which vary from one energy technology to another.

3.3 Due to the different subsidies and/or taxes on individual energy sources in different Member States, it is very difficult and complicated to get an overall picture – covering the whole EU – of the costs of the various energy sources. This aspect will be looked at again in the comments in section 4.

3.4 In this section, we discuss the expected costs of a growing share of intermittent renewable energy sources, before going on in the next section to look at possible further economic repercussions and to make recommendations for action. While also other energy sources may experience rising costs, while forecasts of future fossil fuel developments – both in terms of use and costs – largely reflect debates on the potential of shale gas and oil and on the significant differences in energy price between the EU Member States and e.g. the USA, and while this may be an important factor in weighing the economic benefits and risks of an increased installation of intermittent renewables, this section is focussed on the expected costs of an increased use of intermittent renewables.

3.5 It is recognised that this must be tentative as no independent and authoritative analysis is known which provides a fully comprehensive energy-costs model, including not only all known externalities but which also recognises the significant impact of recent developments in the sourcing and production of unconventional fossil fuels. Eventually, the Commission should launch an economic study assessing the impact of the Roadmap 2050 on the EU economy and its global competitiveness, before making final decisions with long term impacts. The social and economic benefits of renewable energy sources should thereby also be assessed.

3.6 External costs play a key role in the debate on different energy sources (especially nuclear energy). Renewable energy technologies may also be associated with risks (e.g. dam bursts, toxic materials) and external costs (e.g. high land occupancy). However, a quantitative analysis of these factors and their interdependence (e.g. because of reserve power-stations using fossil fuels) goes beyond the scope of this opinion, but should be addressed in future debates.

3.7 If increased installation of intermittent renewable energy sources continues, indirect systemic costs will outstrip the direct costs of the "electricity production facilities". Although the direct costs of such "production facilities" have significantly gone down, in the meantime, they are not yet competitive without subsidies and still contribute to the rise of the energy bill. However, the additional cost factors of the complete energy supply system referred to below will become substantially more significant only when the relative share of renewable energy sources rises. This is explained in greater detail below.

3.8 **Intermittent output.** Wind and solar energy are only produced when the wind blows and/or the sun shines. This means that facilities used to convert intermittent renewable energy sources into electricity only achieve maximum output for a limited number of hours per year - the period of use of the installed capacity is around 800-1 000 hours for photovoltaic cells (in Germany) and around 1 800-2 200 hours for onshore wind energy, or around twice as much offshore. For example, in Germany the energy yield (derived from Energie Daten 2011, Bundesministerium für Wirtschaft) in 2011 for photovoltaic cells and wind turbines was respectively only just over 10% and just under 20% of the theoretical total annual yield achievable with constant output. By contrast, fossil and nuclear power stations can achieve much higher levels (80-90%) of annual average use (i.e. over 7 000 hours at full capacity), enabling this potential to be used for baseload capacity.

3.9 **Excess capacity.** This means that to replace the annual average output from "conventional" – fossil or nuclear – energy sources using intermittent renewable energy sources, production capacity will have to be increased by factors well in excess of annual peak load; significant production facilities with excess capacity will have to be installed and kept operational together with significant excess transmission/distribution facilities. Even more of these will be needed due to energy lost during storage and reuse.

3.10 **Two typical cases.** The consequences of this necessity can be illustrated by two typical situations; on the one hand we have a situation in which during the period in question most "production facilities" are supplying electricity (**excess supply**), and on the other a situation in which only an insufficient minority are operating (**excess demand**).

3.11 **Excess supply.** Given the need for excess capacities, whenever electricity generated from wind or solar power exceeds grid capacity and current demand from presently accessible consumers, three things can happen: either production partially shuts down (meaning that some potential energy output is unused), or grids become overloaded, or – if the requisite facilities exist – surplus electrical energy can be stored and subsequently supplied to consumers when wind or solar output becomes insufficient. Some mitigation is expected from the possibilities for flexible use (point 3.16).

3.11.1 **Grid overload and security of energy supply.** Energy produced from German wind and/or solar power stations from time to time already now overloads existing transmission grids in neighbouring countries (especially Poland, the Czech Republic, Slovakia and Hungary (EurActiv, 21 January 2013), a source of irritation entailing a threat to grid operation and also additional costs due to remedial measures plus the need to invest into protective systems (such as phase-shifting transformers). There is a risk of significantly exceeding tolerance and seriously endangering the security of supply.

3.11.2 **Storage.** In order to (i) relieve the grid system from the overload of the excess supply from the huge overcapacities which are an inherent result of the growing application of intermittent renewables, and (ii) to store this energy for later use, the development and installation of sufficient overall storage capacity represents a challenge, an opportunity and an absolute necessity.

3.11.3 **Storage loss factor.** While water storage power plants lose the least amount of energy and have already been in large-scale use for many decades, due to economic and natural factors and the need for public acceptance, scope for wider and sufficient use of such systems in Europe is very limited at present. Other storage systems for large-scale use are still under development. Forecasts suggest that electricity supplies from innovative storage facilities will cost at least twice as much as unstored electricity (Niels Ehlers, *Strommarktdesign angesichts des Ausbaus fluktuierender Stromerzeugung* (Designing electricity markets in response to the development of intermittent electricity production), 2011); this means a loss factor of at least two. In this area in particular, there is a very great need for research and development.

3.11.4 **Development of the complete electricity supply system must be a priority.** Consequently, in order to further install facilities for producing energy from intermittent renewable energy sources, priority will have to be given at first to installing and making operational the missing components of the complete system, in particulate adequate transmission infrastructure and storage systems, as well as systems for flexible usage.

3.11.5 **Preliminary measures.** This must happen if there is to be a continued rationale for priority feed-in to grids, so as not to exceed grid tolerance, and enable renewable electricity production to meet demand without threatening security of energy supply. Otherwise priority feed-in rules will have to be revisited.

3.12 **Excess demand.** Given that renewable energy sources produce a fluctuating output, they can only make a very limited contribution to "firm capacity", i.e. to secure coverage of peak annual consumption. The German Energy Agency (Dena) (*Integration EE*, Dena, 2012) estimates that this contribution is in the range of 5-10% for wind energy, and as little as 1% for solar energy (compared to 92% for lignite-fuelled power stations). These ratios may be more or less propitious depending on the geographical location and climate conditions of the individual countries concerned.

3.13 **Backup power stations.** This means that conventional power stations (backup power stations) will still be needed to compensate for insufficient renewable energy output and provide reliable capacity which can be regulated. Until we have enough innovative electricity storage facilities, such conventional power stations will remain essential. Some conventional technologies are no longer economically profitable, although they are necessary to secure the stability of grid operation. If these backup power stations use fossil fuels (as opposed to hydrogen generated through a process of electrolysis powered by electricity from renewable energy sources, for example), they will also make it more difficult to achieve the Energy Roadmap 2050 target.

3.13.1 **Keeping capacity in reserve.** Compared to "normal" power stations providing baseload capacity, backup power stations are used less intensively over the course of the year and may operate with lower efficiency levels and higher variable costs. They therefore have higher life cycle costs than normal power stations. The economic incentives needed to ensure the requisite backup capacity are now under discussion (Veit Böckers et al., *Braucht Deutschland Kapazitätsmechanismen für Kraftwerke? Eine Analyse des deutschen Marktes für Stromerzeugung, Vierteljahrshefte zur Wirtschaftsforschung* (Does Germany need capacity mechanisms for power stations? An analysis of the German electricity market, Economic Analysis Quarterly, 2012)).

3.14 **Evening out regional differences.** Alongside backup power stations and storage technology, another option is to even out regional differences in terms of excess supply and demand at certain times, e.g. when the wind is blowing in north-western Europe but not in the south-east. Using this option requires, however, that regions benefiting from high wind levels at a certain moment will also have sufficient excess capacity to cover demand in regions currently lacking in wind, and that both regions will be interlinked with adequate transmission lines.

3.15 **Expanding electricity transmission grids.** given that the vast majority of renewable electricity generation capacity feeds into low and medium-voltage grids, these will have to be developed and strengthened. Transformers and control systems ("smart grids") will also have to be adapted to the new role of distribution grids. Moreover, investment in high-voltage transmission grids is urgently needed, since insufficient interconnections (e.g. between Northern and Southern Germany) cause unplanned flows of energy which endanger the security of transmission systems' operations. This is partly because most wind energy facilities are not located close to high concentrations of consumers or storage facilities, and because additional capacity could enable closer synchronisation in Europe, in order to partially substitute for storage facilities and backup capacities.

3.15.1 Ensuring economically viable use of European renewable energy potential at the same time as security of energy supply will thus require major extension of existing electricity grids at local, national and transnational-European level in order to optimise the use of fluctuating energy outputs.

3.16 **Demand-Side Management (DSM) and electro-mobility.** shifting demand from peak to off-peak periods ("**functional energy storage**"), including electro-mobility, is another option which can contribute to buffer the effects of intermittency. Some uses of electricity would lend themselves to this, for example air conditioning and cooling and heating systems, electrolysers, and electrical melting furnaces. Electro-mobility by means of battery-powered vehicles may be another option here. It should be established what financial incentives, combined with smart-metering, could encourage customers to make the relevant capacity available.

3.17 **Costs of the system as a whole.** The economy as a whole, i.e. basically consumers (and/or taxpayers), will inevitably be burdened with the total costs arising from the use of intermittent renewable energy sources. These include the lifecycle costs of at least two energy supply systems: on the one hand, a set of power stations fuelled by renewable energy, inevitably requiring significant excess capacity that will have to be used, and on the other, a second set of power stations together with conventional backup capacity, electricity storage, new transmission capacity, and demand management for end customers Of course, these must be balanced against the costs associated with continued use of fossil fuels (see 3.3) and potential subsidies for non-renewable electricity production.

3.18 Unless other reasons can be found, it is remarkable that, in countries where proactive support schemes for intermittent RES are in place, for example Germany and Denmark, domestic electricity prices are already now around 40-60 % higher than the EU average (EUROSTAT 2012). As a result, increased use of intermittent renewable energy technologies in line with the Roadmap 2050 targets will lead to a rise in costs for electricity, which, if passed on to consumers, initial rough estimates suggest could result in a severalfold increase in electricity prices. In the light of this, please refer to the recommendations in point 3.5.

3.19 The first answer to the Irish Presidency's question is therefore that producing increasingly more electricity from intermittent renewable energy sources in line with the Roadmap 2050 targets will lead to significantly higher costs for electricity users. So far, the public debate has not usually looked closely enough at the costs of the complete system, focusing instead only on the costs of (intermittently) feeding energy output into the grid, which is estimated to represent half of total costs.

4. **Economic factors**

In view of the above, the most important point to consider next is what steps to take so that (i) the resulting cost increase can be kept as low as possible, (ii) its impact can be made acceptable, (iii) European economic strength will benefit and (iv) energy supply is secured.

4.1 **The system of renewable energies as a whole.** In order to prevent avoidable wastage of financial resources and even yet higher energy prices, priority must be given to the planning, development and installation of the necessary components of the complete system – storage facilities, networks and backup power stations – on a sufficient scale to pave the way for the further installation of intermittent renewables. The example of Germany and the reaction of neighbouring countries show what happens when we fail from the very beginning to take this principle into account.

4.1.1 **Conditions for energy providers.** This means that such a complete renewable energy system covering the whole EU has to be installed, in order to avoid feed-in rules be reviewed (see 3.10.5). For example, providers of electricity from intermittent renewable sources could be required to follow a day-ahead production schedule. This task could be facilitated by potential synergies with supply systems based on district heating and cooling and with transport systems.

4.2 The debate on what further steps to take should distinguish between the different categories, timeframes and areas of action (even though these are correlated), for example:

— security of energy supply at all times, as an absolute priority;

— limits of grids both at transmission and distribution levels;

— Community policies at EU level versus individual countries going it alone;

— in terms of economic policy: implications of higher costs, depreciation cycles, innovation, investor confidence, energy costs in manufacturing, business and transport, market economy versus planned economy;

— in terms of social policy: jobs (without cross-subsidising), energy costs for private consumers;

— timeframe: on the one hand we need to plan up to 2020-2030, but on the other we need to think beyond 2050. We need time for many new developments and their implementation. Hasty action can lead to mistakes;

— scope for developing and testing innovative approaches;

— internationally: (i) in relation to climate/rising CO_2 emissions, and (ii) in relation to economic policy and European competitiveness, "carbon leakage".

4.3 **Priority list.** When considering options for action, more attention must be paid to global trends and facts, a clear list of priorities must be drawn up for the key objectives, and the growing trend to not harmonised regulatory interference by governments of the various member states must be curbed (see 4.7). Rather than this we need to build trust and thus unlock potential private-sector interest in investment. The following paragraphs look at some aspects of this problem.

4.4 **A global approach.** The overarching goal of European energy and climate policy should be to take the right steps and send the right messages in a way which is as conducive as possible – despite the setbacks to date (Copenhagen, Cancun, Durban, Doha) – to minimising the rise in global CO_2 concentration levels, to strengthening European economic competitiveness on global markets, and to making energy on European markets as economical as possible. Given that climate is a global issue, a solely Eurocentric approach is misleading. Laying claim to a "pioneering" role could not only lead to investment and job creation but also undermine our international negotiating position and our appreciation of reality.

4.5 **Transparency, civil society and consumer interests.** If we want to get civil society constructively involved in these processes (TEN/503) and to implement energy policies which are more closely geared to consumer interests, there must be more openness, and ordinary Europeans and decision-makers must be made more familiar with the quantitative facts and correlations. Achieving this is often made more difficult due to the one-sided arguments and information put forward by various privileged stakeholder groups concealing the downsides of their positions. The Committee welcomes the relevant Council conclusions (Renewable Energy Council, 3.12.2012), but at the same time would call for more ambitious and open information policies.

4.6 **European Energy Dialogue.** An important element of the further procedure would be the establishment of a public dialogue about energy across Europe as outlined in the proposal recently adopted by the Committee (TEN/503) and welcomed by the European Commission. Public involvement, understanding and acceptance of the different changes which our energy system will have to go through over the coming decades are essential. In this regard, the EESC's membership and constituency, reflecting European society, is well placed to reach out to citizens and stakeholders in the Member States and establish a comprehensive programme embodying participative democracy and practical action.

4.7 **A European energy community.** The Committee confirms its commitment to a European energy community (CESE 154/2012). Only such a community can represent European positions and interests effectively in relations with international partners while making best use of the relevant regional and climate conditions. Moreover, this is the only way of coordinating and improving national rules and support instruments, which often contradict one another, and of managing and implementing grid development within Europe in the best possible way.

4.8 **Internal energy market.** a European energy community implies a free internal energy market (CESE 2527/2012), including renewable energies. This could ensure that, in view of the complete overhaul of the energy supply system envisaged by the Energy Roadmap 2050, electricity production can be geared to consumer needs as economically as possible, and that investments are made at the right time, in the right places (e.g. in regions with the right climates), and in the most economical electricity generation technologies. Renewable energies must therefore be integrated into a European internal energy market which operates in accordance with free market principles.

4.8.1 **Competitive renewable energies.** In order for renewable energies to become competitive on the energy market, CO_2 emissions from fossil fuels must be sufficiently factored into prices by an appropriate and coherent pricing or market instrument. Renewable energies should therefore in the medium term be made "competitive". Unregulated electricity prices plus appropriate carbon prices (e.g. taxes) as an investment incentive should be enough to make this happen. Alongside appropriate charges for network use, this should be a necessary and sufficient condition for investment in backup power stations, storage facilities and demand-side management at the right time, in the right place, and in the right quantity. In this situation, subsidies would only be needed for research, development and demonstration activities linked to new technologies.

4.9 **A cautious approach to sharing costs.** Even though the expected rise in electricity costs is just beginning, measures are already discussed or even installed for exceptional cases. On the one hand, as the Committee has asked ([1]), low-income social groups should be protected from energy poverty. On the other hand, the most energy-intensive industrial sectors need protection from rising energy costs, so as not to undermine their global competitiveness; failing this, their production sites would relocate outside Europe, to countries where energy is cheaper. This would certainly not help the climate cause ("carbon leakage") (TEN/492).

4.9.1 However, one of the repercussions of this situation is that SMEs and middle income groups will in addition have to bear the burden of costs which specific sectors are spared.

4.10 **Avoiding deindustrialisation.** Further deindustrialisation of the EU should be avoided. At present, deindustrialisation is creating the illusion that European efforts to reduce CO_2 emissions are succeeding. However, what is actually happening is a hidden form of "carbon leakage": if products are manufactured elsewhere instead of in Europe as was previously the case, the associated "carbon footprint" will remain or could even be exacerbated.

4.11 **More research and development** instead of rushed and premature large-scale market launches. The distinction between research, development and demonstration on the one hand, and large-scale market launches and support on the other must not be blurred; among other things, this could even lead to market situations which would impede innovation. Excessive subsidies for photovoltaic energy (e.g. in Germany, Frondel et al., Economic impacts from the promotion of renewable technologies, Energy Policy, 2010) have not helped to develop a competitive system in the EU (Hardo Bruhns und Martin Keilhacker, *Energiewende – wohin führt der Weg* (The energy transition - where is it taking us?), Politik und Zeitgeschichte, 2011). We now have cheaper solar panels not because of Europe but because of China! We therefore need to focus on developing all potentially viable options for low-carbon energy, especially sources capable of contributing to baseload capacity, such as geothermal energy and nuclear fusion. Neither in Europe nor in the rest of the world will we have solved the energy problem once and for all by 2050!

4.12 **Offering incentives for investment:** In view of the current crisis and the need to develop the complete supply system, investments in new technologies and infrastructure are urgently needed. Such investments boost optimism, helping to

([1]) OJ C 44, 11.2.2011, pp. 53-56.

create jobs and confidence. This also applies to most investments in low-carbon technologies such as renewable energy sources, subject however to certain limitations and conditions, some of which have already been mentioned earlier in this opinion. In particular, policies should avoid prescriptions demanding specific technologies, as these could lead to further misallocation of limited resources (see above).

4.13 **General recommendation.** The general recommendation is therefore to review the framework of regulations and conditions and to ensure they create a climate which stimulates research, encourages investment, favours innovation, supports the internal market and does not jeopardise the security of energy supply. Subsidies must focus on research, development and demonstration of technologies and systems. At the same time, the only support for renewable energy sources being competitive in the market should come from the criterion of CO_2 avoidance costs (carbon pricing) (CESE 271/2008). At the same time all subsidies for fossil fuel consumption should be abolished.

4.14 **A level playing field for global competition.** To ensure that this approach contributes enough to meeting global climate challenges without imposing additional competitive disadvantages at international level on European industry, countries in other parts of the world must urgently make similar efforts or agree on realistic joint targets, to ensure fair and comparable conditions for competition at global level. Despite the disappointments to date, the Committee supports continued efforts by the EU to achieve this.

4.15 **Europe going it alone.** However, if these efforts fail, the question remains how long the EU can afford to continue going it alone and working towards radical targets without seriously undermining its own economic strength, thus depriving itself of the very resources it needs to prepare for climate change – which in that case would probably be inevitable – together with all its economic and political repercussions.

Brussels, 17 April 2013.

The President
of the European Economic and Social Committee
Henri MALOSSE