Opinion of the European Economic and Social Committee on the 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions — Energy Roadmap 2050'

COM(2011) 885 final

(2012/C 229/25)

Rapporteur: **Mr COULON**

Co-rapporteur: **Mr ADAMS**

On 15 December 2011, the Commission decided to consult the European Economic and Social Committee, under Article 304 of the Treaty on the Functioning of the European Union, on the

Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – Energy Roadmap 2050

COM(2011) 885 final.

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 10 May 2012.

At its 481st plenary session, held on 23 and 24 May 2012 (meeting of 23 May), the European Economic and Social Committee adopted the following opinion by 137 votes to 6 with 9 abstentions.

1. **Conclusions and recommendations**

1.1 The EESC notes with great interest the Energy Roadmap 2050 and its objective of providing a framework for the agreed policy of the substantial decarbonisation of the energy sector in Europe by 2050 (European Council October 2009). The challenge is not only to achieve a sustainable and secure low carbon energy mix in a competitive market but to convince civil society that this is an attainable objective.

1.2 EU Member States have different energy resources and infrastructure and the decarbonisation goal is a much bigger challenge for some countries than for others. The Roadmap offers considerable flexibility in its approach which enables countries to develop appropriate action plans. This will involve considerable burden sharing in order to achieve the decarbonisation goal.

1.3 This is an ambitious but vital goal if Europe is to play its part in combating climate change and to achieve greater energy security. The widest possible debate among the European public will be necessary and the Committee believes the Roadmap can be effective in launching this dialogue. But it must promote engagement at every level – personal, community, regional, national, at EU level and, in particular, with complementary global action.

1.4 The Roadmap concludes with ten conditions or priorities for immediate action. The EESC agrees with all these and in particular with the last one which recommends the establishment of concrete and specific milestones to guide progress over the next few years. The Committee agrees also that the creation of a policy framework for 2030 is now becoming important so as to provide a reliable guide for investment decisions over the next few years that will have to look well beyond 2020 in calculating their benefits and returns.

1.5 Preliminary to that the EESC recommends carrying out an urgent review of the Energy 2020 Strategy. This is essential in adjusting the final course towards 2030 or 2050. The Committee would like to see country-by-country and sector by sector reports on the three main objectives set for the current decade.

1.6 It is important to obtain an early indication of whether the challenging goals of the Roadmap can be achieved and to review their impact on the EU's economy including global competitiveness, employment and social security.

1.7 The involvement of the public in energy transition issues is essential. A European civil society forum and active steps towards establishing a European Energy Community will both be constructive steps in achieving the desired goal of a sustainable energy future.

2. **Introduction**

2.1 The Energy Roadmap 2050 is the concluding policy framework proposal in a series produced by the European Commission to underpin European energy and climate change policies (see particularly the Low Carbon Roadmap 2050 – COM(2011) 112 final). The Roadmap provides a framework

in which the three aims of decarbonisation, security of supply and competitiveness in European energy policy could be realised. The Roadmap itself does not make specific recommendations on policy actions or intermediate targets and the scenarios presented should not be regarded as policy proposals.

2.1.1 Globally, on present trends and present policies the primary demand for energy is expected to increase by one-third between 2010 and 2035, an increase which will only be marginally affected by lower economic growth. The share of fossil fuels in global primary energy consumption will only fall slightly (from 81 % in 2010 to 75 % in 2035) so energy-related CO_2 emissions will increase by a further 20 % in this period, indicating a long-term rise in the average global temperature in excess of 3.5 °C (IEA World Energy Outlook November 2011).

2.1.2 Although the Roadmap focuses on the decarbonisation of the energy system it recognises two major vulnerabilities. Energy imports comprise some 55 % of the EU energy mix, and the international energy market is highly competitive and volatile. Ultimately only coordinated global action can resolve what is a global problem. Europe could play a leading role by demonstrating how the energy transformation can be managed in one major region of the world, possibly gaining first mover benefits in the process and reducing import dependency.

2.2 The challenge is urgent. Typically, energy investments last 40 years or more. To achieve the type of energy transition deemed necessary, with significant changes in supply and demand, we need to start now and avoid locking-in carbon-intensive investment. Political, technical and economic uncertainties mean that the Roadmap does not offer a single development path to 2050. It explores possible transition routes and recognises the need for flexibility in a changing and uncertain world. Although the Lisbon Treaty extended the powers of the Commission with respect to energy policy, it specifically reserved the energy mix to national governments and any action at European level must accept that division of responsibility. The Roadmap does, however, point to the need for a new spirit of practical cooperation to emerge to achieve the optimum result and the Committee strongly supports this pragmatic approach, for example the development of a European Energy Community.

3. **Summary of the Energy Roadmap 2050**

3.1 Up to 2020 the way forward on energy is largely already committed by existing plans and the policies put in place to deliver the 20-20-20 strategy. The Roadmap now highlights the urgent need to develop energy strategies for the years beyond 2020. Governments need to act now to provide continuity of supply, investor certainty and minimise lock-in effects. Delay will both increase costs and the subsequent carbon minimisation effort.

3.2 Recognising the difficulty of predicting energy futures with certainty, seven alternative illustrative scenarios have been developed. The first two present the likely outcome of doing no more than continuing with existing policies and current policy initiatives – both would fail to deliver the 2050 carbon reduction goals. The other five offer alternative pathways to the 2050 goal, based on different technology and policy options:

— very firm energy efficiency measures;

— strong use of carbon pricing to drive a variety of low carbon solutions to compete in the market place;

— extensive support measures for the development of renewable energies;

— more nuclear and less carbon capture and storage (CCS);

— more carbon capture and less nuclear.

3.3 The Commission derives ten conclusions about structural change to the energy system from the scenario modelling. The picture that they paint is that decarbonisation is possible and should be less costly than current policies in the long-run. This will be in the context of an energy mix where electricity plays an increasing role, with prices rising in real terms and as a proportion of household expenditure until 2030. There will be higher capital expenditure but lower fuel costs and very significant energy savings throughout the system will be crucial. The share of renewables will rise substantially in all scenarios and it is assumed that carbon capture and storage plays a vital and significant role in system transformation, whilst nuclear energy will continue to provide an important contribution, with decentralised and centralised systems increasingly interacting as options widen.

3.4 The Roadmap notes that energy security needs a specifically **European** policy on security of energy supply and the development of infrastructures and relations with transit and producing third countries. Policies for the development of new technologies, the integration of renewable energy in the market, energy efficiency and savings and infrastructure development will be more efficient if coordinated at European level.

3.5 All scenarios will involve change and adaptation by energy users and the Commission notes the need for public engagement and involvement and recognition of social impact. Higher levels of investment in R&D and technological innovation will be required and outstanding single market and

regulatory issues dealt with. The energy infrastructure needs significant upgrading and new capacity whilst member states and investors need concrete milestones. The Commission plans to issue further relevant Communications – on renewable energy, the internal market, CCS, nuclear safety, and energy technologies. These will shape the 2030 policy framework.

4. **General comments**

4.1 Given the many technical and political uncertainties about the future the Committee agrees that the Roadmap's method of modelling alternative scenarios for 2050 is an appropriate approach, which enables the impact of different technical developments, different policy mixes and different external events to be compared and evaluated.

4.2 There is some lack of transparency about the modelling methodology and the assumptions built into it. More information about this needs to be made available so that other experts can test the approach and develop other scenarios on different input assumptions. Nevertheless the Committee believes that the information included in the Roadmap annexes are a positive step and supports the Roadmap's main conclusion that substantial decarbonisation by 2050 is feasible, and that that outcome would, in the long term, provide Europe with a more secure and sustainable energy base going forward than continuing with existing policies, and at a broadly comparable cost over the 40 years to 2050. However, although feasible, the decarbonisation challenges of the Roadmap are very substantial and currently face many obstacles.

4.3 The Roadmap shows that there are different ways in which decarbonisation may be achieved. All of them have some key elements in common – a major push on energy efficiency, a big expansion of renewables, a greater reliance on electricity in the fuel mix, a more extensive and smarter grid, and new arrangements for storing electricity or back-up capacity. Other elements are more dependent on technical developments yet to be fully proven or on the resource base and choices of individual countries (clean coal, nuclear energy etc). Public acceptance and cost variation are both significant underlying factors in all options, and no route is without risk.

4.4 The Committee agrees with this analysis and the implicit conclusion that the EU should focus its primary collective effort on pushing forward the common elements which will be needed throughout Europe as quickly, coherently and efficiently as possible.

4.5 The Committee also agrees with the Roadmap's analysis of the main challenges and opportunities that need to be addressed at European level to transform the energy system, rethink the energy markets, mobilise investors, engage the public and drive change at international level. With due regard for the objections and comments set out below, the Committee can recognise the soundness of the suggested priorities, in particular the final section which identifies ten key conditions or issues that must be taken up urgently to drive progress forward.

4.6 The Committee is, however, dismayed about the extent to which progress in the EU and some of its Member States is already falling behind existing targets. The Committee urges recognition that the extent of this shortfall is disguised by the decline of high carbon-emitting production processes in the EU, their expansion in other parts of the world, and the subsequent import into the EU.

4.7 Technological development takes time to become fully available at competitive prices. Energy investments have a particularly long cycle, typically 40 years, making it necessary for the EU and Member States to urgently establish indicative targets for 2030, together with supporting policies, to avoid the lock-in of carbon-intensive plants. It is the very timescale of these investment cycles which may determine the pace of progress towards the final 2050 goal – and whether this can realistically be achieved. Converging political and business goodwill translated into practical action through supportive programmes and legislation will be necessary.

4.8 At present, energy efficiency and savings are not being driven forward fast enough, in particular in the light of inter-institutional negotiations on the current proposal for the Energy Efficiency Directive. The Commission's forthcoming review of national programmes for energy efficiency should stimulate additional action but be aware that a reduction in demand may also affect energy investment. Progress on renewables is held back by fluctuating Government support and in some cases by local resistance. Modernisation of the grid and energy storage is proceeding too slowly. A truly flexible 'smart' grid carries additional investment costs but the Committee considers that the benefits in providing what will be the foundation of a mutually beneficial European energy community are predominant. We have commented further on this in the Opinion on Infrastructure Regulation [1].

4.9 The price for carbon emissions that was meant to be established by the ETS is much too low and volatile to give a useful signal to investors. However, the consequences attached to assumptions about high ETS unit prices in the future (200-300 euros/tonne in 2040-2050) require further analysis. These, and other unresolved issues, create barriers to fulfilling the ten conditions for progress identified by the Roadmap. A first priority must be to examine these problems openly and honestly and to fix them promptly so that further progress can be made.

4.10 In the longer term this will make the European economy more resilient and competitive in the world than just continuing with present policies. But in the shorter term the investment needed will inevitably lead to energy price increases and extra costs for consumers, business

[1] Guidelines for trans-European energy infrastructure - OJ C 143 of 22.5.2012, p. 125.

or governments (or probably some mixture of all three). It is also likely to have different impacts in different Member States, which differ substantially at present in their degree of reliance on fossil fuels, their current levels of energy efficiency and in their potential for development of renewables.

4.11 In this connection the likely continued reliance on coal in power generation in many parts of Europe, coupled with the growing interest in the potential of shale gas will need collaborative research and financing efforts to implement complementary CCS programmes. Shale gas, though useful in reducing third country energy supply dependency, carries significant environmental risks which must be fully evaluated. Establishing burden-sharing principles and cost allocation of large infrastructure programmes between countries are necessary requirements. Countries that are dependent on coal for energy production need sympathetic encouragement and incentives to make the maximum decarbonisation effort.

4.12 In the EESC's view it is vital that all these impacts be fully costed, debated and accepted by all concerned, and that measures be taken to share the burden of adjustment according to capacity and in a spirit of solidarity at both European and Member state level. Experience shows that communities can be brought to accept the need for change and the costs involved in such transformations – but only if they are fully engaged, do not believe themselves to be unfairly disadvantaged and can see and accept for themselves the reasons. National governments need to give their citizens the tools to participate in these expected changes, clearly set the objectives as well as explain why these steps are needed.

4.13 It is also essential that vulnerable consumers should be protected from the impact of higher energy prices, that vulnerable businesses should be protected from unfair competition from regions outside the EU not subject to the same constraints. Member States or regions with special problems in making the energy transformation may also need extra support through the structural funds or other mechanisms but different support schemes should not create unequal competition between countries and regions. Rather, harmonisation of justified support schemes as well as of cost allocation principles of large infrastructure projects between countries should be dealt with. The concomitant risks inherent in the central planning processes, which all this requires, need to be noted.

4.14 The European Commission should effectively monitor the strategies of the EU Member States to guarantee that consumers' interests are assured and the implementation of smart & low-carbon technologies are based on cost-efficiency. In particular a well functioning internal market, the reinforcement of the powers and independence of energy regulators, and a broad universal service obligation should all be set in a context of transparency, accountability and public information about sustainable consumption.

4.15 Further expansion of renewables is also facing some problems at present. On the technical side plans and investment have not yet been put in place to accommodate further expansion of variable and widely distributed sources of supply into the grid and storage system. On the economic side, although the average unit cost of renewables is continuing to decline, this so far remains a more expensive option for power generation than conventional methods (particularly gas-fired power stations). On the consumer side there is some local opposition to certain types of installation (particularly wind power). So although from a 2050 standpoint the high renewables scenario looks the most attractive option with the greatest security of supply, and virtually zero costs of the fuel used (sun, wind etc) the problems of getting there look the hardest from where we are now, and will require very determined and consistent political leadership to achieve. Even so, the preceding arguments are only valid in as much as carbon-free energy storage systems or back-up power stations will be available to compensate for the fluctuating nature of most renewable sources.

4.16 Managing the transformation will require determined and co-ordinated efforts at all levels. Strong European action is needed to establish common standards for energy efficiency in all sectors, to drive forward innovation in key technologies, to integrate the market and harmonise fiscal measures and incentive systems, to reform the ETS, to co-ordinate plans for an integrated Europe-wide smart grid and energy storage systems, etc. An early review of the Energy 2020 Strategy is regarded as essential before setting Europe on a final course towards 2030 or 2050. The Committee would like to see country-by-country and sector by sector reports on the three main objectives set for the current decade.

4.17 The Committee considers it to be essential that Commission and Member States establish effective mechanism for driving the transformation forward co-operatively. The Committee favours the early establishment of an integrated European Energy Community; and meanwhile they urge the Commission and member States together with the regulators and energy operators to establish co-operative mechanism that can enable them to work together almost as though there were an Energy Community already in place.

5. **Specific comments**

5.1 *Energy Mix*

5.1.1 The decarbonisation of Europe's energy system could be a real asset for Europe's competitiveness in the medium term. It will entail sweeping changes in the energy production mix of Member States and involve a gradual move away from fossil fuels (oil, gas, coal) which still account for 80 % of the European energy mix. Such fossil fuels are largely imported, which puts the European Union in a situation of financial and economic dependence (almost 55 % of our energy comes from sources outside Europe). The EU's annual purchases of oil and gas amount to EUR 270 and 40 billion respectively and the cost of obtaining these fuels risks rising even further in the years ahead due to the volatility of oil and gas prices.

5.1.2 The transition to local sources of low-carbon energy will be less costly for Europe than the maintenance of an energy system which is dependent on imported primary energy, particularly in the context of constantly growing global demand. A system of dispersed energy sources stimulates the local economy and job creation and makes the public more energy-conscious. Its development could make a major contribution to achieving the EU's energy and climate goals. Progress in introducing a system of local, low-carbon energy sources depends on the energy and financial policies of Member States. The Commission is expected to take more decisive action to support national policies for the development of local energy sources.

5.1.3 In this sense, renewable energy should be encouraged along with any technologies that can help achieve the goal of decarbonisation at a lower cost. Biomass may also have a part to play though it will be important to ensure that the methods chosen contribute to carbon reduction on a full life-cycle analysis and do not contribute to food insecurity. Across Europe, there is concern about nuclear energy and opposition to its development. However, nuclear energy might help bring about this transformation in the energy system and reduce CO_2 emissions in those countries choosing the nuclear option, by making it possible to lower the costs of the electricity system and prices, though questions remain about whether some costs, for example those ones related to safety, waste storage, decommissioning and liability issues, remain externalised or socialised.

5.1.4 Electricity must play a more important role than it does today, as it can make a large contribution to the decarbonisation of transport and heating/cooling. The planned doubling of its share of final energy consumption must be accompanied by sweeping changes in electricity production methods and arrangements for trading it between European countries and by increased and actual competition between power generators and sellers.

5.1.5 Oil should continue to be primarily used for freight and long-distance passenger transport; as for gas, it can be used as a temporary substitute for the most polluting sources of energy (such as coal or oil), yet its primary role in the period up to 2050 should be to act as a transition fuel on the road towards low-carbon energy sources. In this light, there should be a detailed stock-taking of the EU's internal gas resources, as they can help boost the EU's energy independence.

5.1.6 With regard to fossil fuels in general, Europe should urgently carry out further research into the location and economic factors relating to carbon capture and storage, in combination with the assignment of a realistic value to carbon and greater public awareness.

5.1.7 Three sectors of activity in particular will need to make radical changes to their organisation. Electricity production must reduce its emissions by at least 95 %; each Member State will have the freedom to strike its own balance between renewable energy, nuclear energy and carbon capture and storage. Residential and commercial buildings will also need to adapt, with reduction targets of 90 % based on more stringent standards for the construction of new buildings and the energy consumption of new appliances, as well as the renovation of existing buildings. Industry will need to reduce its own emissions by 85 % and monitor the potential risk of carbon leakage – through relocation of production to countries that apply less restrictive emissions standards.

5.2 *Industrial and financial commitment*

5.2.1 Energy transition will provide an opportunity to breathe new life into European industry, generate activity and comprehensively review our modes of production and consumption. Europe's competitiveness must be underpinned by research, innovation and a capacity to bring clean technologies to market. With this in mind, the EU and its Member States must prioritise large-scale projects involving European operators, to serve industry generally but with a particular concern for SMEs and the role of localised energy production also needs to be considered and evaluated.

5.2.2 The transition towards a low-carbon economy must promote employment in the internal market. In tandem with the transformation of the energy industry, the right conditions must be created for the development of new jobs. The construction and renewable energy sectors should be able to create some 1.5 million additional jobs by 2020.

5.2.3 The EESC agrees with the Commission's assessment that the additional investment (EUR 270 billion per year during the period up to 2050, or 1.5 % of EU GDP), will help Europe to boost growth. As much as EUR 175 to 320 billion per year could be saved on hydrocarbon imports alone. However, the investment community is demanding a coherent and consistent market framework across Europe and greater collaboration between Member States. Innovative financial investment instruments should be developed in particular to support SMEs in the energy field.

5.2.4 There is a need to pool the necessary financial resources and to go beyond national-level support systems which are ineffective and stifle competition. The planned 2013 review of the environmental state aid framework should make it possible to support the promotion of all technologies that can help reduce CO_2 emissions.

5.3 *Improving and reducing our consumption: more energy efficiency and energy trading among Member States*

5.3.1 A major European drive is needed to reduce energy consumption, improve how we use it – by promoting energy-saving behaviour and less energy-intensive technologies – and trade energy efficiently. Buildings (39 % of all final energy consumption in Europe), transport (30 %) and industry (25 %) all need a common framework of binding rules. There is huge scope for saving energy: the industrial sector could reduce its energy consumption by 19 % and the transport sector by 20 %.

5.3.2 The EESC recommends pursuing the action committed to under the Climate and Energy Package in a rational manner, taking into account the need to support the countries of Central and Eastern Europe.

5.3.3 The massive growth of renewable energies in the North Sea, and potentially, but to a lesser extent, in the Baltic Sea region, and of solar and wind energy in southern Europe will require new, 'smarter' infrastructure to improve trading between European regions and countries. The development of such 'smart grids' could make it possible to cut consumption by 9 % and CO_2 emissions by between 9 and 15 %. This will entail priority investment in such strategic infrastructure, estimated at between EUR 1.5 and 2.2 trillion in the period to 2050, to modernise and develop European electricity and gas networks.

5.3.4 It could be useful for groups of Member States from a particular geographical region to coordinate their energy mixes, infrastructure and market rules in order to share the benefits of the various sources of energy at their disposal. Being more inter-connected and harmonised, their markets would be more resilient to fluctuations in production and consumption and together better placed to ensure security of supply for the EU's energy needs.

5.4 *Involving the public in energy transition*

5.4.1 Public acceptance of energy choices (nuclear, CCS storage, wind farms, high-voltage power lines etc.) is a challenge for Europe's democracies today. The EESC, as well as the national ESCs, consumer organisations and other NGOs have a central role to play in promoting clear and transparent information about these policies and involving the public more effectively. The Roadmap is an opportunity to develop participatory democracy in relation to an issue which affects every citizen.

5.4.2 The EESC suggests launching a broad information and awareness-raising campaign to inform the European public about the various energy transition options, the central role of infrastructure and the new consumption behaviour expected of people in Europe.

5.4.3 The EESC considers that the creation of a European civil society forum would boost the flow of information within the EU, by bringing together all local, regional, national and European stakeholders on a regular basis to jointly discuss the main issues of the energy transition for the period up to 2050.

5.4.4 The creation of a *European Energy Community* would also focus attention on the vital and strategic dimension of energy (accessibility, affordable tariffs and prices, regularity, reliability etc) and the changes that need to be made over the next 40 years. It would embody the idea of a Europe which listens to the people, and which addresses issues that are of direct concern to them. This project would involve greater social harmonisation, which is needed to strengthen and give new meaning to the European project.

5.4.5 The EESC recommends giving firmer support to local and regional initiatives which are in the front line when it comes to issues of smart mobility, infrastructure and transport, new construction and renovation projects, heating and cooling networks and urban planning. The EESC considers that their initiatives should be encouraged as they often promote energy policies that are innovative, devolved and democratic.

Brussels, 23 May 2012.

The President
of the European Economic and Social Committee
Staffan NILSSON

APPENDIX

to the Opinion of the European Economic and Social Committee

The following section opinion texts were rejected in favour of amendments or compromises adopted by the assembly but obtained at least one-quarter of the votes cast:

'*1.1 The EESC welcomes the Energy Roadmap 2050 and its objective of providing a framework for the agreed policy of the substantial decarbonisation of the energy sector in Europe by 2050 (European Council October 2009). The challenge is not only to achieve a sustainable and secure low carbon energy mix in a competitive market but to convince civil society that this is an attainable objective.*'

Outcome of the vote on the amendment: 88 votes in favour, 41 votes against and 13 abstentions.

'*4.5 The Committee also agrees with the Roadmap's analysis of the main challenges and opportunities that need to be addressed at European level to transform the energy system, rethink the energy markets, mobilise investors, engage the public and drive change at international level. Subject to the more detailed comments below the Committee supports the priorities suggested, and in particular the final section which identifies ten key conditions or issues that must be taken up urgently to drive progress forward.*'

Outcome of the vote on the amendment: 75 votes in favour, 51 votes against and 24 abstentions.

'*5.1.3 In this sense, renewable energy should be encouraged along with any technologies that can help achieve the goal of decarbonisation at a lower cost. Biomass may also have a part to play though it will be important to ensure that the methods chosen contribute to carbon reduction on a full life-cycle analysis and do not contribute to food insecurity. Nuclear energy might help bring about this transformation in the energy system and reduce CO_2 emissions in those countries choosing the nuclear option, by making it possible to lower the costs of the electricity system and prices, though questions remain about whether some costs, for example those ones related to safety, waste storage, decommissioning and liability issues, remain externalised or socialised.*'

Outcome of the vote on the compromise: 89 votes in favour, 53 against and 8 abstentions.