

**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: Investing in the Development of Low Carbon Technologies'**

COM(2009) 519 final

(2011/C 21/09)

Rapporteur-general: **Gerd WOLF**

On 7 October 2009 the European Commission decided to consult the European Economic and Social Committee, under Article 262 of the Treaty establishing the European Community, on the:

*Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Investing in the Development of Low Carbon Technologies*

COM(2009) 519 final.

On 3 November 2009, the Bureau of the European Economic and Social Committee instructed the Section for Transport, Energy, Infrastructure and the Information Society to prepare the Committee's work on the subject.

Given the urgent nature of the work (Rule 59 of the Rules of Procedure), the European Economic and Social Committee appointed Mr Wolf as rapporteur-general at its 463rd plenary session, held on 26 and 27 May 2010 (meeting of 27 May), and adopted the following opinion with 168 votes in favour and three abstentions.

## 1. Summary and recommendations

1.1 The SET Plan submitted by the Commission deals with the main current measures aimed at achieving the vital, linked objectives of climate protection and security of energy supply and at maintaining Europe's international competitiveness. The Committee fully supports the proposed investments and measures.

1.2 Only by means of extraordinary, joint efforts will it be possible to convert our entire energy system - supply, conversion and consumption - and gear it to these objectives.

1.3 This requires the development of low-carbon energy supply and use technologies and methods which are also internationally competitive with existing technologies.

1.4 The Committee is, however, extremely concerned that the expenditure this will require from the Commission, the Member States and private industry is still massively underestimated. The Committee therefore urgently recommends that an appropriate financing plan supported by the Commission, the Member States and industry and firmly based on the future EU budget be drawn up. Until then other sources of financing should be mobilised. In particular the Member States' entire revenue from CO<sub>2</sub> emissions certificates should be exclusively used for this purpose. The same should apply to revenue from a possible future CO<sub>2</sub> tax.

1.5 In view of the vital importance of the energy and climate problem and its impact on competitiveness, the Committee considers it senseless to skim off additional tax revenues from

the energy industry - intended to help protect the climate - for other purposes.

1.6 Investment in the development of low-carbon energy technologies offers opportunities for innovation, economic dynamism, sustainable growth and jobs. This is particularly true as usable and affordable energy is the lifeblood of our economy and way of life. Providing energy economically is a decisive factor in determining Europe's international competitiveness. This means that we need future-orientated ways of obtaining energy.

1.7 The Committee stresses in this context the particular importance of electrical energy. It recommends, however, that more attention also be paid to energy use outside the electricity sector and that innovative research approaches be sought in this area too, as this is where the lion's share of fossil energy is used at present.

1.8 In order to allow the Commission to perform its coordination function efficiently, appropriate R&D programme structures should be established by agreement with the relevant stakeholders. For its part, the Commission needs experienced, internationally recognised and committed experts who are active in their areas of specialism and who are fully committed to the success of the programme which they are coordinating.

## 2. The Commission Communication (content much simplified and abbreviated)

2.1 The SET Plan is intended to be the technology pillar of the EU's energy and climate policy.

2.2 The key element of the SET Plan is the EU roadmaps for the period 2010 to 2020 for the development of technologies with low emissions of CO<sub>2</sub> into the atmosphere (low-carbon technologies). They, together with a financing plan and the division between industry and government, are set out in a Commission staff working document <sup>(1)</sup>.

2.3 The Commission Communication covers, *inter alia*:

2.3.1 European Industrial Initiatives, namely:

- wind power
- solar energy
- electricity grid
- sustainable bio-energy
- CO<sub>2</sub> capture, transport and storage (CCS)
- sustainable nuclear fission
- fuel cells and hydrogen.

2.3.2 Energy-efficiency - Smart Cities initiative

2.3.3 The European Energy Research Alliance (EERA). This concerns joint programmes by research institutes and universities.

2.3.4 Other objectives include:

- other technologies, such as offshore technologies other than wind power for renewable energy, energy storage, extending the life of nuclear power plants and disposal of nuclear waste;
- fusion energy, in particular the ITER project;
- basic research, e.g. motor fuels direct from sunlight, solid-state (digital) light sources and high-storage-density batteries;
- activating poles of science and research. Cohesion Policy also provides significant investment;
- international cooperation.

2.3.5 Investment in the EU has to increase from the current EUR 3 bn per year to around EUR 8 bn per year to effectively move forward the SET Plan actions.

2.3.6 At least 50 % of auction proceeds from the new European Emissions Trading System is to be reinvested at national level in climate protection measures, with part being earmarked for the development of clean technologies.

2.3.7 The incentive and leverage effect of public financing is to be maximised with a spectrum of financing instruments.

2.4 The Commission is therefore calling on the Council and the European Parliament:

- to support the 2010-2020 technology plans,
- to allow SET Plan initiatives to be supported from existing Community programmes,
- it is calling on the Member States to step up their efforts to support the financing of low-carbon technologies,
- to support the proposed development of financial instruments as a contribution to the financing of the SET Plan,
- to approve the plans of the Commission and the EIB to this end,
- to approve the development of existing and new international technology-orientated initiatives.

### 3. General comments by the Committee

3.1 **Copenhagen Climate Conference.** The Committee acknowledges the efforts made by the EU and its Member States to bring the Copenhagen Climate Conference to a successful conclusion. It sees the 2 °C increase objective as a first step towards taking climate protection seriously. It is therefore all the more regrettable that no agreements going beyond statements of intent or binding commitments by the participants were achieved.

3.1.1 **Seriousness of the threat underestimated.** Despite the still growing world population with its energy hunger <sup>(2)</sup> and massive catch-up needs, the finite stocks of fossil primary energy sources <sup>(3)</sup> and Europe's growing import dependency, clearly the seriousness of the energy and climate problem and the necessary investments are still seriously underestimated by many politicians and other players. This may be because of the long-term nature of the phenomenon, the uncertainties inherent in the climate models, economic interests, the feared loss of quality of life, reluctance to make the necessary investment or because the impact on the regions in question is seen as less critical.

<sup>(2)</sup> According to estimates by the International Energy Agency (IEA), worldwide energy consumption will grow by 50 % by 2050.

<sup>(3)</sup> According to conservative estimates, half of the 'fossil' resources will have been used by 2050.

<sup>(1)</sup> SEC(2009) 1296 of 7.10.2009.

**3.1.2 Economical use of resources.** The development of competitive low-carbon energy technologies<sup>(4)</sup> will also help to slow down the rate at which finite stocks of fossil primary energy sources are used up; it will also influence their price and thus promote sustainability. Only in this way can fossil energy sources be made to last longer, making it possible to prepare more effectively for the time when they are gone. Whoever does not act now will be hit all the harder in the future.

**3.1.3 Consequence: low-carbon technologies.** It is therefore all the more urgent to step up efforts to develop new or existing technologies and methods for low-carbon energy extraction and use which are internationally competitive with existing technologies. Low-carbon energy use technologies are only used on a significant scale internationally if it is financially attractive to the relevant stakeholders.

**3.1.4 Option of a 30 % reduction target.** Things will become even more urgent if the option of a 30 % CO<sub>2</sub> reduction target<sup>(5)</sup>, which the Committee supports, should be adopted (i.e. if the international conditions are met).

**3.1.5 Possible further increase in consumption.** The IEA reference scenario<sup>(6)</sup> forecasts steadily growing consumption of fossil primary energy sources, especially coal, in the coming decades. The IEA argues that strenuous efforts<sup>(7)</sup> will be needed to break this trend, so that globally the use of fossil energy resources reaches its height in 2020 and thereafter begins to decline gradually, increasingly being replaced by low-carbon technologies.

**3.2 Research and development – the SET Plan.** Research and development are therefore of outstanding importance, and the SET Plan submitted by the Commission plays an important part in this respect. It includes the share of financing from the Community budget earmarked for this purpose.

**3.2.1 Research and development. International efforts and competition.** The Copenhagen Climate Conference again demonstrated that even states like the USA and China, which did not support binding agreements, are nonetheless devoting significant funding to research and development related to the objectives listed in point 3.1.2. This also shows, however, that Europe will only be able to maintain its leadership if it devotes significantly more resources to R&D.

<sup>(4)</sup> With the exception of CCS.

<sup>(5)</sup> COM(2010) 2020 EUROPA 2020.

<sup>(6)</sup> International Energy Agency – IEA – World Energy Outlook 2009 – Reference Scenario.

<sup>(7)</sup> IEA – World Energy Outlook 2009 – the 450 Scenario.

**3.2.2 Investment programme for innovation, dynamism and jobs.** Investment in appropriate research and development offers outstanding opportunities for innovation, economic dynamism, sustainable growth and new jobs. This is particularly true as the availability of usable and affordable energy is the lifeblood of our economy and way of life. Without a sufficient supply of energy under economic conditions, our economy, our social system and our society in general are threatened with collapse. This is why we need future-orientated forms of energy supply.

**3.3 Approval.** The Committee therefore approves the Commission's initiative as well as the measures proposed in the Communication as an important and essential step. It calls on the Council, the Parliament, the Commission, the Member States, as well as industry and the social partners to do everything in their power to tackle the development and application of low-carbon energy technologies and to make the funding for the necessary R&D investment available.

**3.3.1 Questionable scale and focus.** The Committee does not consider it to be its task in the context of this opinion to check in detail whether the proposed framework set out in the Commission document<sup>(8)</sup> and its distribution among the proposed objectives are appropriate to the objectives. It therefore recommends checking again whether the priority assigned to the projects is correct and whether the total amount of funding is in line with the importance of the objectives. It should also be ensured, after an appropriate transitional period, that the measures are having an effect, if necessary revising and extending the financing plan accordingly.

**3.3.2 The financing problem.** The Committee stresses that the aim of converting our entire energy system - supply, conversion and consumption - and gearing it to the combined objectives of climate protection, security of supply and sustainability will only be achieved by dint of extraordinary efforts, and that the research and development effort needed to achieve this is significantly underestimated. Looking at the size of the USA's R&D spending in this area, the Committee doubts that the investment earmarked will be enough to ensure that such extensive developments can be achieved successfully on a broad front and with the necessary emphasis, or even to achieve market leadership.

**3.3.3 Comprehensive financing plan.** The Committee therefore urgently recommends that an appropriate financing plan supported by the Commission, the Member States and industry and firmly based on the future EU budget be drawn up.

<sup>(8)</sup> SEC(2009) 1296 of 7.10.2009.

**3.3.4 Tapping additional sources of finance - costs of energy consumption as a benchmark.** Until then other sources of financing should be mobilised, both at Community level and particularly in the Member States. The Committee is pleased to note that the EIB has also indicated its willingness to participate. The costs of current energy use should be taken as a benchmark for the necessary investment: a significant percentage should be earmarked as insurance for the future! The Committee refers in this context to its opinion on the Action Plan for Energy Efficiency <sup>(9)</sup>.

**3.3.4.1 Revenue from CO<sub>2</sub> emissions trading and a possible CO<sub>2</sub> tax.** In addition, the entire proceeds <sup>(10)</sup> of the Member States' CO<sub>2</sub> emissions trading should be exclusively <sup>(11)</sup> used for the development of low-energy technologies. In view of the extent of the climate and energy problem, the Committee considers it senseless to skim off part of these revenues for other purposes. This recommendation also applies to revenue from a possible future CO<sub>2</sub> tax. The Committee calls on the Member States not to rule out this recommendation.

**3.3.4.2 No diversion of financial resources.** In view of the vital importance of the energy and climate problem and its impact on competitiveness, the Committee considers it senseless to skim off additional tax revenues from the energy industry intended to help protect the climate for other purposes.

**3.3.4.3 Certificates reserve.** The Committee welcomes the Commission's intention of using the 300 million EU Allowances set aside from the New Entrants Reserve of the Emissions Trading Scheme (ETS) to support carbon capture and storage and innovative renewables. These allowances will be made available via Member States to fund demonstration projects selected on the basis of criteria defined at Community level <sup>(12)</sup>.

**3.3.5 Create incentives for innovation.** The Committee would also refer to its opinion on Community innovation policy <sup>(13)</sup>, the recommendations of which apply particularly to the development of sustainable energy technologies.

**3.3.6 Distinguishing between development and application.** The Committee recommends making a clearer distinction between the necessary development of existing and

of new, cheap, low-carbon energy technologies and their broad application and market penetration.

**3.4 Limited predictability.** So far experience has shown that future developments and their effects in the longer term, also in the field of energy and climate policy, cannot be correctly predicted. It is therefore impossible today to narrow down the choice of the technologies which will be needed in 2050. Rather, all promising options should be followed up in order to achieve the objectives set for 2050 and beyond as efficiently as possible, taking account of the conflicting demands of security of supply, competitiveness and climate protection. The year 2020 will be a milestone in terms of establishing whether at least the objective so far set has actually been achieved.

**3.4.1 Thematic breadth of development.** The Committee therefore welcomes the thematic breadth proposed by the Commission in respect of technologies and measures at all stages up to application-readiness, in order to meet the conditions for a flexible approach to application based on experience and to avoid premature decisions.

**3.4.2 Basic research.** The Committee is pleased that the Commission again above all stresses the importance of, and need for, sufficient basic research. Only in this way can the foundation be laid for basic new discoveries and the resulting applications.

**3.4.3 European Energy Research Alliance.** The Committee also welcomes the proposal to establish a European Energy Research Alliance. The Commission should use the instrument of open coordination and especially co-financing by financiers in the Member States and industry, in accordance with the participation rules.

**3.4.4 Leverage of the SET Plan.** Accordingly, when examining the proposed financial framework, it should be ensured that the Community funds available under the SET Plan are also sufficient to exert the desired leverage effect on the necessary participation of the Member States and industry.

**3.5 Setting of priorities for application.** When putting the technologies and systems developed into effect, further important principles - beyond the climate protection objective - such as security of supply and economy (e.g. cost of CO<sub>2</sub> prevention) should be given greater emphasis, with due consideration for regional and global aspects (energy availability from solar, hydroelectric or wind power, distance, interests of the raw material suppliers etc). Accordingly, instruments for initial market support should not specify particular technologies or favour them through special support.

<sup>(9)</sup> OJ C 10, 15.1.2008, p. 22.

<sup>(10)</sup> e.g. auction proceeds in the 2013-2020 trading period.

<sup>(11)</sup> In the communication the Commission proposes that only 50 % be used, and not exclusively for R&D (see point 2.3.6).

<sup>(12)</sup> Including geothermal energy.

<sup>(13)</sup> INT/509. Not yet published in the Official Journal.

**3.6 Importance of the electricity sector.** A major proportion of the proposed technologies and measures concern systems for the provision or use of electrical energy. Although at present the electricity sector accounts for only about 19 %<sup>(14)</sup> of the European energy market, the Committee considers that concentrating the proposed R&D measures on the electricity sector to some extent is justified, as electrical energy now plays an essential, key role in all areas of daily life, technology and the economy. The aspiration to electrify land-based transport as far as possible (electric cars, railfreight) and – in addition to combined heat and power – rely more on electrical technologies (pumps, compressors) for heating buildings using heat pumps and geothermal energy will further strengthen the role of electricity.

**3.6.1 The decisive role of renewable energy sources.** The Committee reiterates that renewable energy sources have a decisive role to play among the low-carbon energy technologies to be developed. The Committee is pleased to note that the share of renewable energy in overall electricity production has risen more than expected in recent years, in particular as a result of the massive development of wind energy.

**3.6.2 European electricity grids.** The Committee accordingly supports the development of appropriate electricity grids in Europe and the development of the necessary technologies (for example ‘smart grids’), in order to balance the rising fluctuations in supply within Europe more effectively, and possibly be able to transport electrical energy from solar power stations in Africa to Europe.

**3.6.3 Storage technologies, base load suppliers and buffer power plants.** If the desired further development of renewable energy sources, which are subject to fluctuations related to the weather, the time of day and the season, comes to pass, capacity will probably not be sufficient to ensure guaranteed, demand-related electricity supply. Stationary storage technologies (e.g. air pressure, hydrogen) should therefore be further researched. And equally importantly, highly efficient and at the same time cheap peak load capacity should be developed. Whereas in the past peak load capacity was used exclusively to supplement base load supply and to handle fluctuating demand, especially consumption peaks, now it is used – and this trend will continue to increase in the future – to compensate for the fluctuating supply of mostly renewable energy sources by means of buffer power plants. Availability and development of this kind of capacity is therefore particularly important.

**3.6.4 System solutions.** In the light of the systems networking of energy technologies referred to above, further priorities should be research into systems problems, the

related issue of security of supply and the development of possible solutions.

**3.6.5 Additional costs.** When calculating total economic costs, account must therefore be taken of the costs of the network, regulatory, storage and buffer systems required for fluctuating energy sources, as advocated by the Committee in the context of the internalisation of external costs, e.g. in relation to nuclear energy and the various forms of use of fossil energy sources<sup>(15)</sup>.

**3.6.6 Energy storage for mobile use.** Additional basic research is important here in order – hopefully – to develop entirely new approaches to significantly higher storage densities, cycles and lifespan, and capacities. Under certain circumstances electric vehicle batteries could perhaps be used as storage for fluctuating energy sources.

**3.6.7 Base load providers.** Base load providers, the work-horses of the power generation industry, have a decisive role to play. It is therefore essential:

- to use coal in a climate-friendly way, especially through greater efficiency and/or carbon capture and storage (CCS),
- to further improve the usability of nuclear power (fission) through further developments in all sectors (safety, final storage, proliferation, use of resources, buffer capacity),
- to develop highly efficient gas-fired power stations,
- to push ahead with the development of fusion technology, which holds great long-term promise,
- to strive for the greatest possible capacity to regulate base load providers too, so that they can be integrated into networked regulatory systems.

**3.7 Focus of energy use outside the sector.** Clearly, however, the focus of energy use by final consumers lies outside the electricity sector. This applies to most industrial use (e.g. chemicals and steel), almost all transport and almost all heating of buildings. The Committee therefore recommends that considerably more attention be paid to the nub of the problem. It is therefore particularly important that new research approaches be developed which go beyond the concepts of ‘energy efficiency’, ‘energy saving’ and ‘electrification’. Only if suitable solutions are found for this area can the climate objectives actually be achieved.

<sup>(14)</sup> EUROSTAT – 2009 Report.

<sup>(15)</sup> OJ C 175, 28.7.2009, p. 1; OJ C 120, 16.5.2008, p. 15.

**3.7.1 Sea and air transport.** In the areas of sea and air transport the Committee sees little chance of avoiding the use of fossil and chemical fuels, even in the longer term <sup>(16)</sup>. Here it is above all a case of improving efficiency, filtering out toxic exhaust gases, obtaining chemical energy sources (e.g. hydrogen and its compounds) by means of electricity and solar energy, and possibly using CCS here as well (in shipping <sup>(17)</sup>).

**3.7.2 Industrial processes, chemicals and steel.** The complete substitution of fossil fuels in industrial processes, particularly the chemical and steel industries <sup>(18)</sup>, is likely to prove equally difficult. The Committee therefore recommends that research and development of innovative solutions be stepped up in this area too.

**3.7.3 Biotechnology and biomass.** The Committee points to the considerable potential of innovative developments in biotechnology and their relevance to the energy sector and the goals being discussed here. However, the use of biomass as a resource, which in the long term is in short supply and which competes with food and raw material production (in this context account should also be taken of the emissions of greenhouse gases <sup>(19)</sup> like NO<sub>2</sub> associated with the use of fertilisers!), should in particular be mainly reserved for applications where there is no alternative.

**3.7.4 Insulation of buildings.** Another important issue is energy savings in buildings. Here there is significant development (and application!) potential for reducing heat loss. More attention should be paid to this, when setting priorities for CO<sub>2</sub> prevention measures.

#### 4. Specific comments by the Committee

**4.1 Community tasks and subsidiarity.** The SET Plan focuses on the Community tasks which are necessary for or conducive to the development of the technologies in question. They should therefore be supranational tasks, or tasks where supranational cooperation plays an important part and generates European added value.

**4.2 Financing plan and priorities.** The financing plan and related priorities should therefore be examined to establish whether they comply with the criteria set out above.

**4.3 Development and application, again.** Similarly, the financing plan should be checked to establish whether it actually focuses on the development of new technologies or systems. The SET Plan should on no account subsidise energy technologies in their broad application.

<sup>(16)</sup> Except for special military uses.

<sup>(17)</sup> If nuclear propulsion is not allowed.

<sup>(18)</sup> Insofar as fossil energy sources are still being used, CCS could be used here too as a way of reducing pressure on the atmosphere.

<sup>(19)</sup> Atmos. Chem. Phys. Discuss. 7, 11191-11205, 2007.

**4.4 Networking with existing programmes.** The Committee also recommends networking the climate-relevant research and development proposed in the SET Plan with existing programmes and projects under the 7<sup>th</sup> Framework Programme, such as the flagship projects of the Future and Emerging Technology (FET) programme. This applies in particular to those areas of the SET Plan which cannot be expected to yield results within the next ten years.

**4.5 International cooperation.** In order to achieve an optimum impact with the resources used, the Committee recommends <sup>(20)</sup> that, particularly in the case of the necessary major projects (e.g. ITER), international cooperation with strategic partners be sought, so as to share the financial and human resources burden, and also to have access to a broader base of knowledge and greater potential for innovation.

**4.6 Role of the Commission.** In order to allow the Commission to perform its coordination function efficiently, the appropriate R&D programme structures should be established by agreement with the relevant stakeholders. For its part, the Commission needs experienced, internationally recognised and committed experts as project officers who are active in their areas of specialism and who are fully committed to the success of the programme which they are coordinating.

**4.7 Public understanding, involvement and acceptance – information and transparency.** It is a precondition for the success of all the measures listed above that the public, particularly people potentially affected by the planned measures, should be fully and openly informed and appropriately involved in the decision-making processes, together with the world of politics, industry and other players. The best way to achieve understanding and acceptance is through comprehensive information, involvement and transparency.

**4.8 Previous Committee opinions.** The Committee points out that it has already adopted opinions on many of the subjects discussed in this opinion, which deal in detail with some of the issues referred to briefly here. Reference is made in particular to:

— INT/146 Research needs for a safe and sustainable energy supply <sup>(21)</sup>

— TEN/299 Energy efficiency of buildings – the contribution of end users <sup>(22)</sup>

— TEN/311 The possible positive or negative impact of increased environmental and energy requirements (policies) on the competitiveness of EU industry <sup>(23)</sup>

<sup>(20)</sup> Opinion of the European Economic and Social Committee on A strategic European framework for international science and technology cooperation, OJ C 306, 16.12.2009, p. 13.

<sup>(21)</sup> OJ C 241, 7.10.2002, p. 13.

<sup>(22)</sup> OJ C 162, 25.6.2008, p. 62.

<sup>(23)</sup> OJ C 162, 25.6.2008, p. 72.

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- TEN/332 A European Strategic Energy Technology Plan <sup>(24)</sup>
  - TEN/398 Eco-efficient economy / paving the way for a new energy era <sup>(25)</sup>
  - TEN/340 Sustainable power generation from fossil fuels <sup>(26)</sup>
  - TEN/404 Enhancing the effectiveness of Community energy policy in favour of SMEs <sup>(27)</sup>
  - NAT/391 Climate Change International Negotiations <sup>(28)</sup>
  - No Turning Back – Resolution of the European Economic and Social Committee on Climate Change, Copenhagen, 7-18 December 2009.

Brussels, 27 May 2010.

*The President*  
*of the European Economic and Social Committee*  
Mario SEPI

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<sup>(24)</sup> OJ C 27, 3.2.2009, p. 53.

<sup>(25)</sup> Not yet published in the Official Journal.

<sup>(26)</sup> OJ C 77, 31.3.2009, p. 49.

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<sup>(27)</sup> Not yet published in the Official Journal.

<sup>(28)</sup> OJ C 77, 31.3.2009, p. 73.