Opinion of the European Economic and Social Committee on ‘Education and training needs for the carbon-free energy society’

(Exploratory opinion)

(2009/C 277/03)

Rapporteur: Mr IOZIA

By letter of 23 October 2008, the European Commission asked the European Economic and Social Committee, under Article 262 of the Treaty establishing the European Community, to draw up an exploratory opinion on

Education and training needs for the carbon-free energy society.

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 15 April 2009. The rapporteur was Mr IOZIA.

At its 453rd plenary session, held on 13 and 14 May 2009 (meeting of 13 May), the European Economic and Social Committee adopted the following opinion by 161 votes to 7 with 5 abstentions.

1. Conclusions and recommendations

1.1. The Committee recognises that education across all age groups and training for technicians and graduates has a crucial role to play in moving towards a zero-emissions society. Countering progressive global warming has been acknowledged as a priority by governments and the scientific community. It is incumbent on the most developed countries, which are responsible for the bulk of emissions, to make the biggest strides and support developing countries in pursuing environmentally and socially sustainable development policies.

1.2. Despite solemn commitments (2003 Kiev Declaration, UN Decade of education for sustainable development 2005-2014), government and local authority initiatives on education and training have been totally insufficient, with the exception of a few significant examples.

1.3. The European Commission is committed to promoting energy efficiency in the Member States, cutting consumption, reducing the energy dependency on third countries, building trans-national grid interconnections – by simplifying connection protocols – and laboriously constructing a unified EU position so as to speak with one voice. While there has been notable progress in recent years, genuine civil society involvement has been lacking and only quite modest progress has been made in education and training. The Committee welcomes the move back to a dedicated energy DG and hopes to see more effective coordination of EU action to combat climate change, under the responsibility of a single authority.

1.4. Several countries have seen a proliferation of initiatives aimed at disseminating information and raising awareness, largely on the initiative of NGOs devoted to this specific goal. At the hearing organised by the Committee, attended by the Energy Commissioner, Andris Piebalgs, some of these experiences were presented, such as Terra Mileniul III, Eurec, the Collodi Foundation (Pinocchio could be an ideal character to endorse children’s environmental education), Arene Ile-de-France and KITH (Kyoto in the home). Trade associations such as the EBC (European Builders Confederation), social housing bodies including CECODHAS and fuel cell manufacturers, such as Fuel Cell Europe, are also making an important contribution to the dissemination of information on the potential offered by the market.

1.5. The Committee is convinced that more and better efforts need to be made by means of a wide range of key players in society:

— Educators: we need to entrust teachers with increasing the environmental knowledge and awareness of the younger generation. Environmental education should not only be on the school curriculum, but should also be an element of lifelong learning studies (L.L.L).

— Local authority administrators: who can influence both land-use decisions and school programmes for the younger generation, integrating into their administrative programmes the elements needed to create a low-carbon society. The prominence given to the European Covenant of Mayors initiative in which over 300 mayors have undertaken to support energy-saving and efficiency in their areas demonstrates the importance and potential of action at this level.
Business (particularly SME) associations: all regional associations should offer a service to companies to facilitate information and training projects. In Spain, there have been successful trials of ‘mobile classrooms’, i.e. specially equipped buses which companies can hire to deliver training courses at the company’s premises. The project, jointly operated by companies and involving the council of Leon y Castilla has trained 5 600 workers in the renewable energy sector.

Trade union organisations: The TUC, for example, has launched a pilot project called Green Workplaces, which has already delivered significant results by signing consumption- and emissions-cutting agreements with certain businesses and institutions. Incorporating energy efficiency programmes into collective bargaining, with shared objectives to be rewarded if achieved, could become a smart way of increasing revenue and profit.

NGOs: the expertise of environmental organisations, coupled with the teaching experience of teachers and scientists, constitutes a crucial added value. Courses for teachers, companies and public administrators could be organised in agreement with local authorities.

Architects and building engineers, who have a huge contribution to make, both in terms of new buildings and in upgrading the housing stock.

Public authorities: increasing the share of green public procurement, i.e. public contracts with ever more exacting environmental criteria, could help to steer the market in the right direction.

Member State governments, by following through on their solemn commitments with substantial action on supporting environmental education.

1.6. Investing in low greenhouse gas emission (GHG) energy is a win-win situation. Several million new high-quality jobs will be needed to achieve the goals of containing emissions, reducing dependency on external suppliers, developing innovative technologies and research.

1.7. As it is not possible to stipulate the content of curricula at EU level, it would be worth designing a quality benchmarking system.

1.8. Developing skills and getting children interested in environmental activities, including outside school, whilst allowing them to choose the initiatives, will lead to a change in lifestyles and also a rediscovery of the value of social interaction. By turning off the TV, children could rediscover childhood games with their friends.

1.9. The majority of actions to be taken fall under the responsibility of the Member States, local authorities, institutions, the productive and social systems and more generally, the public. There could, however, be an important role for the EU in encouraging and promoting the full range of necessary measures.

1.10. Consumer education: Directive 2006/32 needs to be strengthened and extended both in general terms and specifically as regards its provisions on disseminating information to consumers on the energy efficiency of various goods and services, to enable them to be responsible citizens. The Commission should include within documentation detailing the national energy plans information on the education, training and information initiatives planned by each Member State.

1.11. Importance of the construction sector: the new directive proposed by the Commission will enhance the energy efficiency of the building stock. The Commission could launch an EU programme to encourage and incentivise radical advances in the up-skilling of technicians.

1.12. Public procurement: this can have a huge influence on enhancing energy efficiency. Significant and exacting energy efficiency requirements should be included in all construction contracts, so that the energy-saving criterion becomes one of the principal elements on which to assess such tenders. Specific training should be envisaged for the public officials concerned.

1.13. In view of the multidisciplinary nature of the issue, specific courses should be planned to train the trainers. The establishment of a European network of national clean-energy education forums, built upon the existing clean-energy organisations and initiatives, could provide a national information channel for suitable programmes and materials, and facilitate the integration of clean energy into school curricula. The Committee supports the establishment of this network.

2. Introduction

2.1. The conference of environment ministers meeting in Kiev in 2003 made the following solemn declaration: 'We recognize that education is a fundamental tool for environmental protection and sustainable development. […] We invite all countries to integrate sustainable development into education systems at all levels, from pre-school to higher education […] in order to promote education as a key agent for change.'

2.2. In December 2002, the 57th session of the United Nations General Assembly, proclaimed the years 2005 to 2014 to be the United Nations Decade of Education for Sustainable Development, in cooperation with Unesco and other relevant organisations.
2.3. Commissioner Piebalgs has stated that: 'We have to develop a society that uses the earth's resources in a manner that ensures the long-term survival of future generations and to do so in a manner that provides us increasing health, peace and prosperity. This is a huge challenge: it will require major societal change; indeed, a third industrial revolution'.

2.4. While the concentration of CO\textsubscript{2} in the atmosphere remained constant for thousands of years at 260 ppm, it is now close to 390 ppm, and this level is rising by about 2 ppm every year. If significant measures are not taken to contain emissions, by 2050 the level will reach 550 ppm. With that degree of concentration, international agencies and the IPCC believe that average global temperatures could rise by up to 6 °C during the twenty-first century.

2.5. Conscious of its own responsibility as one of the major polluters, Europe will come to the Copenhagen conference with its house in order, ready to obtain equally robust commitments from its major international partners. While the recent establishment of an energy DG was a very important step, it would be logical to bring climate change issues under one single authority.

2.6. Clearly, to attain the desired results, a general effort is needed from every single member of society, whilst educational measures are needed from school – or better still pre-school – age to raise awareness and bring people on board. The problem of global warming should be addressed alongside the more general issues of limited resources and sustainable development.

2.7. At the public hearing, the KITH representative had an effective line to round off his speech, paraphrasing John F. Kennedy: 'Ask not what our planet can do for you but what you can do for our planet'. Such a change of mentality will be the key to the future of humanity.

3. Importance of education and training in a low-carbon society

3.1. The aim of a low-carbon society requires the rapid development of a network of infrastructure, particularly that which is aimed at 1) ensuring that the public is properly informed on issues regarding CO\textsubscript{2} emissions, 2) training a sufficient number of technicians at various levels, specialised in the new sector of carbon-free technology, and 3) investing in research and development in this field. Traditional patterns of behaviour are often a barrier to practices that are more compatible with reducing CO\textsubscript{2}. For this reason, training measures must be introduced here as well. Furthermore, technical and scientific education is necessary for the general public; training of technicians is obviously a prerequisite so that development of the sector is not stifled by a lack of suitably qualified technicians. Among the low carbon technologies in which it will be necessary to train a sufficient number of technicians and engineers, we should not overlook the nuclear sector, which will remain for many years to come a low-GHG-emission energy source. In this sector it is vitally important that the public receive full, transparent information on the advantages and disadvantages of nuclear power.

3.2. Initiatives in which children are encouraged through play to develop an awareness of environmental protection, by means of mini competitions based on the environmental impact of domestic activities are particularly useful. The children bring to school a list of actions carried out by the family day-to-day, and learn to quantify the total savings made in terms of energy or CO\textsubscript{2} emissions by making a number of small everyday gestures. They compete amongst themselves, whilst involving, informing and increasing the awareness of their parents as regards good practice.

3.3. This education must begin in primary schools. This is undoubtedly useful in instilling awareness of environmental problems in young people, together with new energy-saving patterns of behaviour. However, this awareness should then be progressively built up to the highest technical level possible in all secondary schools, particularly schools providing a technical/scientific education, with the dual aim of moulding a more knowledgeable society and providing many young people with a specific grounding that might steer them to choose a profession related to curbing CO\textsubscript{2} emissions.

3.4. Europe is in the midst of a global economic crisis. One possible way out of it would be to develop high-tech sectors in the field of environmental protection. Reducing CO\textsubscript{2} emissions is clearly one such example, being applicable in numerous key sectors of advanced economies, such as the car industry, public passenger and goods transport, construction and even electricity production, which is often associated with possible savings in terms of greater energy efficiency.

3.5. The speed with which European industry will be able to move towards the new technologies, compared to other players in the world economy, could be crucial to Europe's economic future.

3.6. While several EU countries are world leaders in a range of technologies linked to energy saving and low CO\textsubscript{2} emissions, recent investments made in other parts of the world (e.g. by the US government in the car industry) could quickly put Europe in a very dangerous position on the back foot.

3.7. In any case, there is a need to reduce the sharp differences that exist between the Member States both in terms of production and innovation capacity in this field and as regards the quality of secondary and tertiary education in these sectors, whilst encouraging exchanges between Member States in high-tech training.
3.8. The difficulty in introducing harmonised teaching standards for environmental education at EU level should not stop us disseminating knowledge by tapping into the potential of the more advanced countries. A quality benchmarking system should be introduced to raise the average EU level.

3.9. The EU programmes ManagEnergy, Intelligent Energy Europe, Comenius and Leonardo da Vinci, geared variously towards training, advice and education, constitute important contributions to the development of a Europe that makes optimum use of its human and environmental resources.

3.10. The establishment of a European network of national clean-energy education forums, built upon the existing clean-energy organisations and initiatives, could provide a national information channel to connect educators with suitable programmes and materials, and facilitate the integration of clean energy and the environment into national curricula.

3.11. The EU should therefore move quickly to develop the low-carbon technology sector, in a consistent and coordinated manner. Crucial to this is the training of a critical mass of experts capable of fostering the development of the sector in the coming decades.

3.12. With the breaking down of language barriers, education and training in secondary schools and universities can and should be coordinated at EU level. There are already examples in Europe of cooperation between universities: the EUREC agency, which runs a European Masters in renewable energy, in conjunction with universities in Germany, France, the UK, Greece and Spain, and the International Masters in technology for reducing greenhouse gas emissions, jointly run by the University of Perugia (Italy), Liège University (Belgium) and Malardalen University in Vasteras, Sweden (www.masterghg.unipg.it). These schemes should be extended and funded by the EU, and geared towards specific subjects, as part of a coordinated plan to train a new generation of highly-skilled technicians in all of the key economic sectors.

3.13. At university level, the advent of specific degree and diploma courses in sustainable development (not only CO₂ issues, but energy-saving, the production of clean energy, etc.) should be accompanied by a substantial increase in funding for research in the field. Indeed, an advanced standard of teaching is not possible unless the teachers are involved in international research projects in their field.

4. Education: examples to follow

4.1. There are some excellent examples in Europe and worldwide of educational initiatives aimed at fostering environmental protection and in some cases, reducing CO₂ emissions.

4.2. The Jackson School of Geosciences within the University of Texas at Austin has for several years been running a cooperation programme with primary and secondary schools in Texas, known as GK-12. Public money is used to fund courses for teachers and students (the teachers also receive a small financial incentive of USD 4 000 per year).

4.3. In Europe there have been many similar initiatives. For example, the British government has a website encouraging people to calculate their carbon footprint and giving advice on ways to reduce it (http://actonco2.direct.gov.uk/index.html).

4.4. The Île de France Regional Council recently (2007) organised and funded an integrated project on environmental education and sustainable development (EEDD), aimed at encouraging specific educational initiatives and bringing together associations with a view to coordinating initiatives within the region.

4.5. The EU’s Young Energy Savers project will produce a series of fun and engaging cartoons, directed by leading animators, showing children that, just like the cartoon characters, they too can make small but effective efforts to reduce their carbon footprint.

4.6. The school, the home and the workplace are the best places to target educational measures to increase knowledge and awareness. Only by promoting mass behavioural and lifestyle changes will it be possible to meet the ambitious but necessary targets set.

4.7. Mechanisms and instruments should be created to enable young people to pursue their own environmental activities outside school. Young people have innovative skills and are enthusiastic about change, but often wish to act independently. Many young people do not engage with activities devised by adults, as their minds are stimulated in different ways.

5. Professional training for technicians and high-level professionals

5.1. This will create millions of new jobs in Europe and worldwide.

5.2. A report was published in September 2008 by the UNEP, ILO, IOE and ITUC entitled Green Jobs: Towards decent work in a sustainable, low-carbon world. As regards the EU, this fascinating study projects that between 950 000 and 1.7 million jobs could be created by 2010 and between 1.4 million and 2.5 million jobs by 2020, depending on whether a standard or advanced strategy is adopted. Between 60 % and 70 % of these jobs would be in the renewables industry and at least a third would be high-skilled jobs.
5.3. Taking into account all of the technology and activity involved in energy-efficiency and saving: waste management and recycling; water provision and its efficient management; and sustainable, innovative transport, the investment required, which could generate a significant number of jobs, could run to hundreds of billions of dollars.

5.4. It is clear from the foregoing that scientific and professional training has a central role to play in preparing workers for the future.

5.5. To stem the downward trend – despite current national budgetary difficulties – major financial aid is needed to foster green jobs. Substantial public incentives are needed to promote training courses for young people and professional development courses for existing workers.

5.6. Industries, trade unions, non-governmental organisations and public authorities should work together, holding dedicated national conferences, to find the solutions best suited to national conditions to foster educational initiatives and professional training in the most innovative sectors and specifically, in a low-carbon society.

5.7. During the public hearing, emphasis was placed on the importance – particularly as regards public administration – of information activities and technical support targeting managers and public officials, aimed at helping them achieve more effective work organisation, be aware of the availability of low carbon products and technologies, and establish a reasonable level of rules for green procurement.

5.8. In the construction industry, significant energy savings are achievable, with a consequent reduction of emissions. Buildings account for 40% of energy use, of which 22% could be saved. Some 41.7% of workers (with considerable variations from country to country) have low-level qualifications, and training them would be prohibitively costly for small companies. This is why we should encourage initiatives such as the mobile classroom project in Spain, in which workers can receive training in eco-friendly building technologies without having to be away from the workplace for long periods. Social housing bodies have promoted a series of initiatives aimed at informing housing administrators and users. The Energy Ambassadors project involves training staff at local authorities, NGOs and social organisations to become so-called energy ambassadors, who initially act as energy contact persons within their own organisation and then go on to disseminate their knowledge to the public.

5.9. One of the professions that can have a positive impact on emissions is architecture, in which a new cultural approach is gaining ground: Rather than basing design on the idea of satisfying artificial lifestyles heavily based on the use of machines and electricity, there is a move towards adapting lifestyles and living environments to the requirements dictated by natural rhythms. It is also important to foster specific technical knowledge on the features of innovative materials that enable energy savings.


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