



Briefing on the European Commission Communication on an action plan for stimulating technologies for sustainable development COM (2004) 38

Prepared for the European Parliament Committee on Environment, Public Health and Consumer Policy

1 Introduction

The Committee on Environment, Public Health and Consumer Policy of the European Parliament has made a contract with the European Academies' Science Advisory Council (EASAC) for the provision of technical-scientific advice in the area of Environment Public Health and Food Safety (project EP/IV/A/2003/09/02). As part of the contract, the Committee has commissioned a review of the European Commission's Communication on an action plan for stimulating technologies for sustainable development, contained in the Commission document COM (2004) 38 final.

The Environmental Technologies Action Plan (ETAP) is designed to promote the development and the introduction into service of new sustainable technologies. It seeks to remove barriers to uptake, to ensure that the EU has a leading role in the development of 'clean' technologies globally and to engage with stakeholders in delivering its aims.

In encouraging the uptake of research into products, the ETAP has linkages to the EU objective that average R&D spend across the EU should reach 3% of GDP by 2010. It seeks to improve market conditions for the uptake of environmental technology and to ensure that European technology takes full advantage of the opportunities to support sustainable development on a global scale.

Five independent experts have reviewed the scientific aspects of the draft Directive, and their comments are summarised in this paper. The experts came from Austria, Belgium, Germany, Denmark and the United Kingdom. Their expertise covered a range of areas relevant to environmental technology.

This review considers each part of the Commission document and focuses particularly on the broad areas of the Action Plan itself, contained in section 4 of COM (2004) 38. The numbers refer to sections of the Plan as they appear in COM (2004) 38.

2 Summary

The EASAC reviewers welcome the aims of the Environmental Technologies Action Plan. The scale of the challenge for Europe in moving towards sustainable development is widely recognised and it is clear that there are major requirements for new technological solutions, both on a European scale and globally. Reviewers are also conscious that these challenges create major opportunities for EU businesses. They believe, however, that there are difficulties in developing suitable technologies and, especially, in bringing them to

market. The main questions reviewers have raised in connection with the ETAP concern the scope of the measures proposed and the likelihood that they will deliver by themselves. In particular there is a broad concern that the ambition of the plan may not be matched by the scale of the investment to be made. The main thrust of this review, therefore, is supportive and it aims to suggest how the Action Plan can be strengthened.

3 Specific Comments

3.1 Section 1. Introduction

The ETAP addresses an important element within the larger quest for modernising the European industrial base while at the same time achieving sustainable development as mandated by the Gothenburg Council. The ETAP also rightly defines environmental technologies in a very wide sense, linking them firmly to sustainable development issues and not restricting them to pollution control. In particular, sustainable energy technologies are crucial to the management of one of the most intractable environmental problems we face, global warming, while at the same time ensuring energy security in an increasingly unstable world.

However, one of the key issues in implementing technologies for sustainable development is a profound change in the raw material base of industry. Industry has to move away from its dependency on fossil resources and towards those raw materials that are fully renewable. There has to be a move to more eco-efficient technologies in general. One important feature of the new approach should be a switch from a concern with products by themselves to a focus on the services they deliver. Reviewers are clear that this will be the core of the modernisation effort envisaged by the document.

This fundamental change necessitates a 'jump of technological development curves', meaning that we have to change the structure of technologies not incrementally but radically. As conventional technologies by definition are not only mature but also have a long history of incremental improvements behind them, any radically new technology will clearly face the disadvantage of a less mature and especially less optimised technical system. This disadvantage usually translates into economic disadvantages, and impedes implementation considerably.

In the opinion of our reviewers, bold action is therefore necessary. All of this is contained in the text of the document, but it needs more emphasis and should be stressed even more in order to make clear the scale of the challenge ahead.

3.2 Section 2. The policy context

The policy context as it is described leans heavily towards environmental agenda. However, sustainable development goes far broader than this and linkage to these more strategic policy agenda would strengthen the Commission's case for investment at the scale that will be needed. In particular the EU has to be aware of the climate of international competitiveness and ensure that the Member States retain and enhance their position. This has to be a major consideration, for example in developing towards a hydrogen economy (assuming this is a real solution to energy problems) in the context of highly significant and well-directed investment by Europe's competitors in America and Asia.

Another important policy concern is international security and in particular security of energy supply.

3.3 Section 3. Building the Action Plan

This section, on building the Action Plan, has elements that cover the technological issues well. The problems of developing and implementing innovation are explored in a technological framework but there is little about the business climate for investment. Work done, for example by OECD, has shown that there are many financial issues involved in technological innovation.

In particular the document is silent about the role of financial institutions, banks, investment houses, intermediaries, interest rates and fiscal regimes in encouraging development and use of new technologies. The document and the plan itself would be far stronger if financial questions were addressed.

3.4 Section 4.1 The actions: getting from research to markets

The 3% target. The aim of directing 3% of GDP towards R&D in Europe by 2010 is part of the modernising effort. It is welcome that this document makes the linkage to the ETAP. It is clear, however, that this financial aim will have to cover the whole range of R&D in Europe at a time where both the Gothenburg and the Lisbon Council goals require a significant increase in the knowledge base of European society to achieve them. The transition and modernisation phase of European society and economy initiated by these two landmark Councils will put considerable stress on the R&D resources as well as on the ingenuity of European researchers in a number of fields.

There is no way of fixing a particular proportion of the 3% that should go to sustainable technologies. However, it will be necessary to prioritise clearly the development and implementation of these technologies against research that addresses conventional technologies like fossil-based technologies and nuclear power. The ETAP so far fails to do this in sufficiently clear language.

Increase and focus R, D & D. The ETAP here indicates an increased focus for demonstration and implementation that is generally very positive. In this context it is necessary to highlight that both demonstration and implementation have strong regional components, especially in the technologies of renewable resources and alternative energy systems. Renewable resources as well as direct and indirect solar energy are provided at a local level and may be harnessed in many cases only (or predominantly) in decentralised, regional contexts. The primary conversion steps, at least in many production networks based on renewable sources, are decentralised.

Within the text, there is little mention of structural funds as a means for promoting sustainable technologies. This is crucial. Demonstration and implementation of sustainable technologies require a strong horizontal integration of EU policies, especially in the areas covered by the DGs Environment, Research, Industry and, very importantly, Regions, Agriculture and Fisheries. The general modernisation of the industrial base of Europe towards sustainable technologies must become a key topic for cohesion and structural funds in the course of this policy integration. This is an important aspect that should be emphasised much more strongly in this context.

On a detail of the text, the reference to 'White biotechnology' might be better placed under technology platforms in section 4.1.2, given the state of the technology in Europe. The United States has a platform for biorefineries.

Technology platforms. Besides establishing technology platforms, the ETAP requires a strengthening of these regional and local institutions within the framework of the ERA and a focusing of their activities on development, demonstration and implementation of sustainable technologies.

In a first step this requires a comprehensive catalogue of these institutions within the Union. Second, it requires an efficient platform for information exchange and cooperation between these institutions. Finally, it requires a strong link between these regional research institutions and the planned technology platforms.

Regional research institutions will also play an indispensable role in engaging stakeholders into technology development and implementation. The strengthening of these institutions is key to reducing contextual, cultural and social barriers as well as to adapting technologies to their environment in economic, social and natural dimensions.

The regional aspect is also of importance in setting the research infrastructure and in the structure of research cooperation. The establishment of technology platforms is certainly a potentially effective measure to improve R&D in this field. However, it is also important to bring regional research institutions into the planning. They are not only major driving forces in applied technology development in this field, they are precisely the institutions best suited to adapt technologies to regional settings and to reduce contextual barriers in this course.

Testing, performance verification and standardisation. Standardisation is a potent means for technology lock-in into existing and conventional development routes. It is therefore of high priority to create a system of testing procedures and standards for sustainable technologies and the new family of products and services that come from them. One of our reviewers has sent a critique of the CEN system in developing standards (see Annex). This makes the point that CEN has a potential important role to play, but that there are impediments to this. The Annex raises a number of important questions about the performance of CEN and about the integrations between different strands of EU policy.

Equally important is the standardisation of raw materials and intermediaries based on renewable resources since, because of their wider variation in quality, the lack of standardisation is a special barrier to technology implementation.

Engagement of stakeholders. One of our reviewers has commented that there are no provisions in this document for the involvement of stakeholders or public in the development of the research agenda. The importance of this is that it cuts the research communities from the broader European community. The ETAP is ambitious, and difficult decisions will have to be taken on priorities. It is essential that these decisions reflect the broad values and aims of the European community as a whole. The Commission has considered the public governance aspects of its work and published a White Paper in 2001. It has also considered the application of this to its research programmes with care and published an action plan in 2002. It is a pity that the thinking in these publications has not been drawn into the EATP.

3.5 Section 4.2 The actions: improving market conditions

Performance targets. There is no doubt about the importance of performance targets. However, as the implementation of sustainable technologies calls for radical changes in both the structure and base of European industry, and as this requires a radical change in technologies over the coming decades, performance targets in the sense of 'output' oriented targets are not sufficient. Besides these targets, there

must be clear targets in terms of 'input' to the industrial sector as well as to others, gradually reducing the dependency on fossil raw materials. The current quotas on renewable energy and biofuels are examples that have to be transferred to other sectors, too.

Leveraging investment. The problem of radical changes as 'jumping the technology development curves' has already been addressed. The very nature of the change puts these new technologies at a disadvantage. They may not only cost more up-front, they may be (and often are) less profitable as they are less optimised than existing technologies.

It is necessary to attract investors that want to be in for the long haul and that either have interest in long-term investment or direct interest in the development of certain technologies.

One important aspect in this context is the necessity to tie development and implementation of sustainable technologies into regional development processes. Not only are these technologies (as emphasised earlier) more decentralised in their structure, they may also serve additional purposes for regions in the environmental, social economic perspective of the region itself. What is still lacking is an instrument for 'regional venture capital markets' that attract regional investors and stakeholders but are supported by risk alleviation and seed money by public participation.

Again, the central role of the structural funds for financing sustainable technologies must be highlighted here.

Public procurement. Public procurement is certainly a potent driving force for the creation of markets for new technologies, products and services. However, experience has shown that there is a close link between standardisation and public procurement. Public bodies may understandably not be very willing to procure products and services that do not conform with existing standards, and this can be a major cause of lock-in into conventional technology routes. Therefore it is of utmost importance to develop standards for these products and services at least on the level of public procurement, as normal standardisation procedures are notoriously lengthy.

Building support in civil society. The support of civil society is certainly a key factor for implementation of sustainable technologies. Again it has to be stressed that however important economic barriers are, they constitute only a part of the problem. Social and cultural barriers as well as failure of technologies to adapt to their context are equally important.

One solution is to highlight the role of regional implementation strategies, and the text refers to this. However, this route is certainly deserves more emphasis than it is given in the Commission's text. The creation of regional markets and trade marks and the 'closing' of regional material flows is of central importance to the implementation of sustainable technologies. This requires, besides many other things, education of managers for these regional markets and material flows and the strengthening of regional research units so that they can play a key role in overcoming these barriers.

In education, it is necessary to change curricula so that they are reoriented towards the knowledge necessary for developing, implementing and operating sustainable technologies. In this respect the upcoming 'UN Decade of Education for Sustainable Development' may become a useful platform for these changes. The European Union must link its educational programmes into this wider initiative as a means to promote (among others) sustainable technologies.

3.6 Section 4.3 Acting globally

Our reviewers are content that this section of the Commission's paper covers the international agenda. It could, however, usefully include other international opportunities arising from the current concern about international security. Reviewers also believe that there is further scope for using current international agreements to promote environmental technology.

3.7 Section 5 Moving forward

Reviewers felt that more could be said on this topic and found the plan rather weak on implementation. There was little critical examination of the procedures for making calls for proposals, preparing and evaluating proposals or on contract negotiations. These are at present cumbersome. They are complex and take inordinate amounts of time and resource. They are felt to be a significant constraint on innovation in European research programmes.

There was a suggestion that the EP Committee could usefully call for simplifications in the arrangement for developing European research programmes. This should be reflected in the ETAP and monitoring systems, which should be simple, accessible and transparent.

4 Conclusions

This Communication has been widely welcomed by our reviewers as important and timely. They are unanimously of the view that it forms an excellent basis for the EATP.

Reviewers have made suggestions for improving the EATP, particularly on the need for a regional dimension and for a more strategic approach to linkages with other policies.

They also suggest that the implementation plan should be strengthened and that there should be a commitment to simplification of arrangements for research procurement.

Finally, there is a call for more awareness of the importance of financial institutions in achieving the goals of the EATP.

5 April 2004

Annex: Comité Européen de Normalisation (CEN)

Instrumental monitoring is required in a number of the legal instruments the Commission quoted in the Communication. On the whole the instrumental operational requirements have been passed to CEN (and its member bodies) to develop specifications for performance-based methods of measurement. The CEN process is slow – it takes up to 3 years to develop a measurement standard to EN status. The process does, however, provide thinking (and adaptation) time for the instrument manufacturing industry, mostly small and medium enterprises (SMEs), to fine-tune their products. Furthermore the CEN Keymark brand name, in principle, offers the manufacturers an EU Marque.

However, a number of things have been found to frustrate progress.

The legislative provisions, which initiate action, do not have technology forcing as a primary purpose – while they attempt to reflect measurement best practice it is a conservative version of it. Process operators see most regulation as burdensome and instrumentation as a ‘distress purchase’ (for example: will legal mechanisms based on emission trading add value to measurement and emission reduction technologies?). The transparency of implementation of monitoring provisions at Member State level is not good and the regulatory authorities are not proactive in sharing information; the network of regulatory bodies, IMPEL, might be strengthened in this area.

Much of the development work (the ‘research’) needed in the field of instrumentation (and data processing) becomes apparent only when the equipment is deployed in earnest and the results of its use (or failure) are seen; at present this only occurs when EN standards come up for renewal – 3 years after their introduction (i.e. up to 6 years after first specification in a legal instrument!). At this time the work needed is seen as too specialised and small for the ‘forward looking research’ aspirations of the EU Framework Programmes. The FPs do have a small budget predicated for CEN identified work but it is very difficult to access.

Finally, CEN has not proved a strong instigator of change; many of its functions are distributed to working groups, their work is usually not independently funded and relies on the enthusiasm of individuals. Standards linked to Directives and mandated/contracted by the Commission bring resources that can lever Member State support, and as a result these have gone relatively well. There has been little support, however, for testing standards for environmental technologies. The Keymark is cumbersome to introduce. What plans does the Commission have to stimulate the performance of CEN?