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- Investing in the Development of Low Carbon Technologies (SET-Plan)

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**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
(SET-Plan)**

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**COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN
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**Investing in the Development of Low Carbon Technologies
(SET-Plan)**

(Text with EEA relevance)

1. INTRODUCTION

A critical challenge

One of the EU's key ambitions must be to develop a low-carbon economy. The EU has put in place a comprehensive policy framework, including among others: the climate and energy targets for 2020 and a carbon price through the Emissions Trading System. We are also working towards the successful conclusion of international climate change negotiations at Copenhagen¹ at the end of 2009. Now, we have to deliver, both in terms of the 2020 targets and, in the longer term, aiming for an 80% cut in greenhouse gas emissions by 2050 compared to 1990 levels.

Reinventing our energy system on a low carbon model is one of the critical challenges of the 21st Century. Today, in the EU, our primary energy supply is 80% dependent on fossil fuels. Networks and supply chains have been optimised over decades to deliver energy from these sources to our society. Economic growth and prosperity has been built on oil, coal and gas. But, they have also made us vulnerable to energy supply disruptions from outside the EU, to volatility in energy prices and to climate change.

There are different possible pathways to a low carbon economy. Clearly, no single measure or technology will suffice, and the precise mix in each country will depend on the particular combination of political choices, market forces, resource availability and public acceptance.

The technology fabric under pressure

What is also clear is that technology and the efficient use of resources lie at the heart of the challenge. We need to stimulate our best brains to push back the frontiers of science, in materials, in chemistry and physics, in nanotechnology and biotechnology, to find new and better ways of producing and consuming energy. But, at the same time, we cannot sit back and wait for such potentially game-changing breakthroughs to emerge from the laboratories and make the often long and arduous journey to market. We have to act now, accelerating the development of those technologies with the greatest potential. This puts our science and technology fabric under pressure, to deliver solutions on time.

¹ COM(2009) 475 sets out the Commission's proposal for a European blueprint for the Copenhagen deal.

Markets alone will not deliver

Markets and energy companies acting on their own are unlikely to be able to deliver the needed technological breakthroughs within a sufficiently short time span to meet the EU's energy and climate policy goals. Locked-in investments, vested interests, as well as the high risks and need for significant investments in less profitable alternatives, mean that change will be slow without a major push. Public policy and public investment partnering with the private sector is the only credible route to meet our goals, established for the public good.

The SET-Plan is the technology pillar of the EU's energy and climate policy

Similarly, Member States are also unlikely on their own to be willing or able to accelerate technology development over a sufficiently broad portfolio of technologies. The European Strategic Energy Technology Plan (SET-Plan)² is the EU's response to the challenge of accelerating the development of low carbon technologies, leading to their widespread market take-up. It sets out a vision of a Europe with world leadership in a diverse portfolio of clean, efficient and low-carbon energy technologies as a motor for prosperity and a key contributor to growth and jobs. It proposes joint strategic planning and more effective implementation of programmes. It now needs to be taken forward to implementation.

A global issue

However, the EU's transition to a low carbon economy would be meaningless without a global transition. This is why strengthening international cooperation is an integral part of climate negotiations and why the G8 agreed to facilitate the development, deployment and diffusion of advanced technologies in emerging and developing economies, as well as the Major Economies Forum agreement to establish a Global Partnership to work together in the development of transformational low-carbon technologies. An active international trade policy will also promote the growth of markets inside and outside Europe and increase the take-up of low-carbon technologies.

Investing in the future – an opportunity rather than a burden

A European approach is essential to realise the ambition of seeing low carbon technologies effectively developed in view of bringing them to the market: it allows key players to come together on a continental scale; it helps to identify and to tackle the barriers holding back innovative products and services in the single market; and it allows different sources of private and public funding to be brought together. The estimates of resources in this Communication are not a proposal for funding from the EU budget. They represent an effort to identify key areas where Europe needs to invest in the coming years to give concrete expression to its low carbon vision. The figures presented should be understood as indications of orders of magnitude. The bulk of the funds required will have to come from the private sector and from Member States, with a contribution from the EU budget towards some of it. In this way, the limited resources available from the EU budget can be used to leverage a step change in the investment provided for the research and demonstration of low carbon technologies.

While fully appreciating the limitations on public budgets over the coming years, the Commission firmly believes that the implementation of the SET-Plan, with sufficient

² COM(2007) 723, 22.11.2007.

resources, represents an opportunity that cannot be missed. New investment today will bring savings to public budgets in the long run, making the achievement of our policy goals closer and cheaper.

2. WHAT DO WE NEED TO FINANCE? A COSTED EU LOW CARBON TECHNOLOGY ROADMAP FOR 2010-2020

Investments over the next 10 years will have profound consequences for energy security, climate change and growth and jobs in Europe. Working together with stakeholders, the Commission has drawn up Technology Roadmaps 2010-2020 for the implementation of the SET-Plan. These roadmaps and the methodology followed to prepare them are detailed in a Staff Working Paper accompanying this Communication³. They prioritise the different needs of the various technologies, depending upon their stage of development and maturity, balancing the short-term needs against longer-term innovation potential.

The roadmaps and associated cost estimates are based on the best available information today. They will be subject to periodic review and amendment in the light of progress on implementation and changing circumstances and priorities. The costings include private investment and public funding, both at EU and national level. They include the costs of research, technological development, demonstration and early market take-up, but exclude the cost of deployment and market-based incentives, such as feed-in tariffs⁴. While helping to build up an overall picture of the funding needs, they should not be taken as a proposal for the future allocation of EU funds. Future priorities for the EU budget will need to be defined as part of the budget review and in the context of the preparation of the next multiannual financial framework.

2.1 European Industrial Initiatives

In a carbon constrained world, technology mastery will increasingly determine prosperity and competitiveness. With the EU policy framework that has been put in place, European industry has the opportunity to lead the world in developing clean and efficient energy technologies. The European Industrial Initiatives⁵ aim to turn that opportunity into reality by focussing effort on key challenges and bottlenecks and proposing concrete actions for the period 2010-2020.

The launching of the initiatives themselves will be accompanied by detailed implementation plans, building upon these roadmaps and further prioritising the actions proposed in function of the available resources and the logic of intervention at different levels.

– The European wind initiative

Wind energy has to accelerate the reduction of costs, increasingly move offshore and resolve the associated grid integration issues if it is to fulfil its huge potential. To support its rapid expansion, we need: to develop a better picture of wind resources in Europe, through

³ SEC(2009) 1296, 7.10.2009.

⁴ Other financing needs, mainly for deployment, to achieve the 20% renewables target in 2020 will be addressed in a Commission Communication in 2010.

⁵ As proposed in the SET-Plan Communication of November 2007 and endorsed by the Council on 28 February 2008 and the European Parliament on 9 July 2008 (the Buzek Report).

coordinated measurement campaigns; to build 5-10 testing facilities for new turbine components; up to 10 demonstration projects of next generation turbines; at least 5 prototypes of new offshore substructures tested in different environments; demonstrate new manufacturing processes; and test the viability of new logistics strategies and erection techniques in remote and often hostile weather environments. All of this must be underpinned by a comprehensive research programme to improve the conversion efficiency of wind turbines.

The total public and private investment needed in Europe over the next 10 years is estimated as €6 bn. The return would be fully competitive wind power generation capable of contributing up to 20% of EU electricity by 2020 and as much as 33% by 2030. More than 250 000 skilled jobs could be created.

– *The solar Europe initiative*

Solar energy, including photovoltaics (PV) and concentrated solar power (CSP), has to become more competitive and gain mass market appeal. Problems derived from its distributed and variable nature need to be resolved. To support the development of PV, we need: a long-term research programme focussed on advanced PV concepts and systems; up to 5 pilot plants for automated mass production; and a portfolio of demonstration projects for both decentralised and centralised PV power production. For CSP, the overriding need is for industrial up-scaling of demonstrated technologies by building up to 10 first-of-a-kind power plants, supported by a research programme to reduce costs and improve efficiency, particularly through heat storage.

The total public and private investment needed in Europe over the next 10 years is estimated as €16 bn. Up to 15% of EU electricity could be generated by solar power in 2020 as a result of such a programme coupled with market-based incentives. More than 200 000 skilled jobs could be created.

– *The European electricity grid initiative*

Electricity networks have to respond to three interrelated challenges – creating a real internal market; integrating a massive increase of intermittent energy sources; and managing complex interactions between suppliers and customers. To ensure that our electricity networks are fit for the 21st Century, we need a strongly integrated research and demonstration programme: research to develop new technologies to monitor, control and operate networks in normal and emergency conditions and develop optimal strategies and market designs to provide all actors with the right incentives to contribute to the overall efficiency and cost-effectiveness of the electricity supply chain; up to 20 large-scale demonstration projects at real life scale to validate solutions and value their real system benefits, before rolling them out across Europe.

The total public and private investment needed in Europe over the next 10 years is estimated as €2 bn. The goal is that by 2020, 50% of networks in Europe would enable the seamless integration of renewables and operate along 'smart' principles, effectively matching supply and demand and supporting the internal market for the benefit of citizens.

– *The sustainable bio-energy Europe initiative*

Bio-energy has to bring to commercial maturity the most promising technologies, in order to permit large-scale, sustainable production of advanced biofuels and highly efficient combined

heat and power from biomass. Different bio-energy pathways are at various stages of maturity. For many, the most pressing need is to demonstrate the technology at the appropriate scale – pilot plants, pre-commercial demonstration or full industrial scale. Up to 30 such plants will be needed across Europe to take full account of differing geographical and climate conditions and logistical constraints. A longer term research programme will support the development of a sustainable bio-energy industry beyond 2020.

The total public and private investment needed in Europe over the next 10 years is estimated as €9 bn. By 2020, the contribution to the EU energy mix from cost-competitive bio-energy used in accordance with the sustainability criteria of the new RES directive⁶ could be at least 14%. More than 200 000 local jobs could be created.

– *The European CO2 capture, transport and storage initiative*

Carbon capture and storage (CCS) technologies have to be widely commercialised if the EU wants to achieve almost zero carbon power generation by 2050 and if the likely continued use of the vast global coal reserves is not to exacerbate climate change. The pressing need is to demonstrate at industrial scale the full CCS chain for a representative portfolio of different capture, transport and storage options. At the same time, a comprehensive research programme will deliver improved components, integrated systems and processes to make CCS commercially feasible in fossil fuel power plants going into operation after 2020.

The total public and private investment needed in Europe over the next 10 years is estimated as €13 bn. The target is to reduce the cost of CCS to 30-50 € per tonne of CO2 abated by 2020, making it cost-effective within a carbon pricing environment.

– *The sustainable nuclear fission initiative*

Nuclear fission has to move towards long-term sustainability with a new generation of reactor type – the Generation-IV reactor. They will be designed to maximise inherent safety, increase efficiency, produce less radioactive waste and minimise proliferation risks. Commercial deployment of these reactors is foreseen for 2040, but to achieve that target, work has to start now. The bulk of the programme up to 2020 will be the design and construction of prototypes and demonstrators, fuel fabrication workshops and experimental facilities and a research programme to develop new materials and components to improve the industrial and economic viability of the reactors. This effort will build upon a solid basis of competences and experience in current nuclear technology which is contributing to meeting the 2020 SET-Plan objectives.

The total public and private investment needed in Europe over the next 10 years is estimated as €7 bn. By 2020, the first Generation-IV prototypes should be in operation. The first co-generation reactors could also appear within the next decade as demonstration projects to test the technology for coupling with industrial processes.

– *Fuel cells and hydrogen*

The Joint Technology Initiative (JTI) on fuel cells and hydrogen was established for 2008-2013 with a budget of 470 M€ of Community funding to be at least matched by industry.

⁶ Directive 2009/28/EC of 23 April 2009.

The JTI has the minimum critical mass needed to develop and validate efficient and cost-competitive technologies for the various applications. However, meeting the market entry targets set by industry will require substantial additional effort. In particular, more and larger scale demonstrations and pre-commercial deployment activities for portable, stationary, transport applications will be required, as will long-term research and technology development to build up a competitive fuel cell chain and a sustainable hydrogen infrastructure across the EU. The additional public and private funding needed is currently estimated as €5 bn for the period 2013-2020.

2.2 Energy efficiency – Smart Cities Initiative

Energy efficiency is the simplest and cheapest way to secure CO₂ reductions. In transport, buildings and industry, available technology opportunities must be turned into business opportunities. This new European initiative – Smart Cities – has the objective to create the conditions to trigger the mass market take-up of energy efficiency technologies.

The initiative will support ambitious and pioneer cities (e.g. from the Covenant of Mayors) that would transform their buildings, energy networks and transport systems into those of the future, demonstrating transition concepts and strategies to a low carbon economy. Participating cities and regions will be expected to test and demonstrate the feasibility of going beyond the current EU energy and climate objectives – i.e. towards a 40% reduction of greenhouse gas emissions through sustainable production, distribution and use of energy by 2020.

The total public and private investment needed in Europe over the next 10 years is estimated as €11 bn. By 2020, the Smart Cities initiative should put 25 to 30 European cities at the forefront of the transition to a low carbon future. These cities will be the nuclei from which smart networks, a new generation of buildings and low carbon transport solutions will develop into European wide realities that will transform our energy system.

2.3 European Energy Research Alliance

The European Energy Research Alliance (EERA) is elevating cooperation between national research institutes to a new level – from an ad-hoc participation in uncoordinated joint projects to collectively devising and implementing joint programmes. To accelerate the development of new generations of low carbon technologies, we need to build on the momentum of the Alliance and boost the scale of its joint programmes through additional investment. Taking ideas out of the laboratory and developing them to the point where they can be taken up by industry is a step that needs to be shortened considerably. The involvement of universities in the Alliance through the platform created by the European University Association will help ensure that the best brains can be mobilised.

Over the next two years, the Alliance will launch and implement joint programmes addressing the key challenges of the SET-Plan with concrete technological objectives. Strong links will be developed with the Industrial Initiatives to ensure industrial relevance. On the basis of current progress, we estimate that the Alliance could expand its activities to effectively manage an additional public investment, EU and national, of €5 bn over 10 years.

2.4 Complementary activities and initiatives

– *Other technology avenues*

At the request of Council and Parliament, the Commission⁷ is examining other avenues with great potential such as other sources of offshore renewable energy⁸, energy storage and renewable heating and cooling. In the nuclear sector, to sustain its current contribution to low carbon electricity, two key challenges identified in the SET-Plan have to be tackled – lifetime extension of facilities and solutions for nuclear waste.

– *Fusion energy*

Fusion is a promising source of energy for the long term. Euratom, as host member of the ITER International Agreement, remains fully committed to the success of the ITER project, where high capital investment is needed for the construction phase.

– *Breakthrough science*

Motor fuels direct from sunlight, solid-state (digital) light sources that last for decades, batteries that store electricity at ten times the current density. These are some of the technologies of the future. But to master them we have to explore new levels of complexity in the physical and chemical phenomena that control how materials perform and interact⁹.

Basic research is chronically underfunded in the EU. The European Research Council is starting to address this problem, but does not foresee a specific energy related programme. By contrast, the US has recently announced the creation of 46 Energy Frontier Research Centres, with a budget of \$777 million (555m€) over the next 5 years. Without a similar effort, Europe will eventually fall behind as new discoveries overtake current technologies. To lay the foundations of our future competitiveness in the face of strong international competition, a further investment of €1 bn should be made in basic research over the next 10 years.

– *Activating poles of science and research*

In addition to the Energy Research Alliance, other poles of science and research must also be activated to work on energy and climate-related challenges. Cohesion Policy provides significant investment to strengthen and further develop the EU's research capacity, to promote the emergence of new centres of excellence and to reinforce human capital potential. The expertise of other sectors can also be harnessed to support EU energy policy. For instance, the European Space Agency could help transfer advanced insulation materials and ultra-efficient energy systems to the terrestrial energy sector, or make use of space applications to monitor and manage energy systems and to enforce legislation.

The proposed Knowledge and Innovation Communities (KIC) on sustainable energy and climate change adaptation and mitigation of the European Institute of Technology (EIT) will have an entrepreneurial outlook, fostering new talent and fully exploiting new innovation opportunities. The annual budget of each KIC is expected to be in the order of €50-100 m,

⁷ Through SETIS, the information system of the SET-Plan.

⁸ Including wave, tidal, currents, and thermal gradients.

⁹ COM(2009) 512, 30.9.2009, sets out a basis for a common strategy for key enabling technologies in the EU.

with a quarter coming from the EIT. The participation of KIC actors in the SET-Plan initiatives would help ensure complementarity and avoid overlaps.

– *International cooperation*

Cooperation on technology development will be a key element of the Copenhagen negotiations and the associated costs and implementing arrangements will form part of the negotiations. The G20 has committed to stimulate investment in low carbon technologies and energy efficiency, as well as to provide financial and technical support for such projects in developing countries. This includes taking steps to facilitate the diffusion or transfer of clean energy technology while ensuring the protection of intellectual property rights.

The EU is ready to contribute its fair share of this international support, through multilateral instruments and by strengthening and expanding its bilateral low carbon technology cooperation activities.

The Commission is already working closely with the US and Japan to define concrete action plans to reinforce our cooperation on energy research. We will build on this experience to ramp up cooperation with other key strategic partners. At the same time, we will continue to improve the coordination of Member States' and EC actions to step up strategic cooperation with partners worldwide. The EU Strategic Forum for International Scientific and Technological Cooperation¹⁰ will be instrumental in improving the framework conditions under which international research is conducted.

Differing circumstances in developing countries require differentiated actions and levels of ambition. Over the past few years, a number of developing countries have formulated national climate change strategies, including China, India, South Africa and Brazil. The EU is supporting developing countries to embark on low carbon development paths. The EU-China Near Zero Emissions Coal (NSEC) project is a concrete example of technology cooperation, in this case demonstrating carbon capture and storage. The Global Energy Efficiency and Renewable Energy Fund (GEEREF)¹¹ will invest in renewable energy and sustainable energy infrastructure funds and similar investment structures tailored to regional needs and conditions. Other initiatives include Mediterranean Solar Plan and the Africa-EU Energy Partnership.

3. SHARING RISKS AND POOLING RESOURCES

With today's level of knowledge, the Commission believes that investment in the EU has to increase from the current €3 bn per year to around €8 bn per year to effectively move forward the SET-Plan actions¹². This would represent an additional investment, public and private, of €50 bn over the next 10 years.

The continuum of risk faced by low carbon technologies at different stages of the development cycle calls for a risk sharing approach in which all relevant actors, public and

¹⁰ The Forum has been set up by CREST, the Scientific and Technical Research Committee, an advisory body of the European Commission and the Council of the EU.

¹¹ Established by European Commission, Germany and Norway. <http://www.eif.org/about/geeref.htm>

¹² A detailed explanation of these figures is presented in the accompanying Impact Assessment SEC(2009) 1297, 7.10.2009.

private, take on that part of the risk corresponding to their own sphere of activity and logic of intervention. In general terms, the higher the technological uncertainties, the more public support is needed, and with a greater proportion of grants. Where the market risk is predominant due to market failures, public support is also justified to level the playing field – and regulation can also help to address market failures. Otherwise, the private sector should be able to cope on its own.

Industry needs to be ready to accelerate the development of new technologies and roll them out rapidly. Banks and private investors will have to finance and invest heavily in the companies that will drive the transition to a low carbon economy. Of course, this represents a major challenge in the context of the financial crisis, where risk-aversion is higher and investment in new, riskier technologies is not high in investors' priorities. Public authorities must therefore be prepared to offer the appropriate incentives and consistent policy signals, and, as necessary, to be ready to significantly increase the public funding of low carbon technology development¹³.

The overall breakdown of non-nuclear energy research financing in 2007 was 70% private to 30% public. Given the public policy-driven nature of the energy transition and the current economic situation, a significant rise in the public share of the burden in the short term towards a more equal level of commitment would have to be explored.

Currently, 80% of public investment in non-nuclear energy research financing has been at national level and 20% at Community level. Given the need to enable a rapid implementation of focused, integrated programmes on technologies that have widespread deployment potentials across the EU, an increase in the proportion of the public investment at Community level may need to be one of the options explored in the budget review.

The level of Community funding required would depend, inter alia, on the interest of Member States to co-finance the SET-Plan initiatives, through Joint Programming¹⁴ on a variable geometry basis. Such a process will allow different partnerships of Member States to cooperate on those technologies of most interest to them, depending upon their preferred energy mix, indigenous resource base and exploitation potential.

Logic of intervention at Community level

The EU landscape of publicly funded research consists mainly of a European 'common pot' managed by the Commission, the Research Framework Programme, and national programmes managed independently by the Member States. Each must capitalise on their own strengths and opportunities.

Action at EU level can take on high risk, high cost, long-term programmes beyond the reach of individual Member States, sharing the risk and generating a breadth of scope and economies of scale that could not otherwise be achieved. It can help generate an optimum programme of activities and maximise knowledge sharing and information dissemination, lowering the overall costs of achieving a given objective. It can address cross border challenges and quickly mobilise a wider pool of talent, competencies and multi-disciplinarity than is available at national level. And it can have a strong leverage effect on industry, as well

¹³ Public funding constituting State Aid in the sense of Article 87(1) of the EC Treaty requires notification to the Commission and must be in line with existing State Aid rules.

¹⁴ COM(2008) 468, 15.7.2008.

as on coordinating national efforts, through the use of funding instruments that promote the European Research Area.

4. POSSIBLE SOURCES OF PUBLIC FUNDING

The new European Emissions Trading System¹⁵ enables, from 2013 onwards, the creation of a virtuous cycle of auctioning revenues being reinvested at national level in the development of more efficient and lower cost clean technologies. The use of the revenues is determined by the Member States, but at least 50% should be used for climate change related activities, including in developing countries.

The 300 million EU Allowances set aside from the New Entrants Reserve of the Emissions Trading Scheme (ETS) will be used 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. However, this scheme does not cover technological risks, but only facilitates the commercialisation of existing technologies by compensating for additional costs over conventional technologies.

At EU level, current Community Programmes, such as the Research Framework Programme and the Intelligent Energy-Europe Programme, and the European Energy Programme for Recovery¹⁶ (for CCS and offshore wind), are the natural instruments for the purpose, but current resources are not on the scale needed to address all the actions proposed in the SET-Plan.

The Commission's concrete proposals to implement the SET-Plan are based on the need for rapid action, a coordinated approach across the EU and the desire to reduce overall costs by optimising the portfolio of funded projects. The approach is grounded in the belief that EU action can offer real added value, with an emphasis on the achievement of specific objectives, effective implementation and more efficient use of scarce resources.

5. IMPROVING COHERENCE AND MOBILISING THE FINANCIAL COMMUNITY

Funding is only half of the story. We also have to spend it well – to maximise the incentive and leverage effect of public financing and ensure the highest possible societal returns.

The funding instrument 'toolbox' is fairly comprehensive. It includes: RTD and innovation programmes at national and EU level; debt based financing; venture capital funds; infrastructure funds; and market-based instruments. However, insufficient resources, fragmentation and the lack of cross-fertilisation is a problem. Grant, subsidy, loan and equity providers tend to act individually without any overall guiding strategy or optimisation process. The SET-Plan should help to address this, by instigating a more coherent partnership approach.

¹⁵ Directive 2003/87/EC as amended by Directive 2009/29/EC of 23 April 2009.

¹⁶ Regulation (EC) No 663/2009 of 13 July 2009 (OJ L 200, 31.7.2009).

Improving the coherence of public programmes

To increase effectiveness and efficiency, the Commission will focus on the implementation phase of the SET-Plan and continue to improve the coordination of existing Community Programmes in the field of energy and of other Community initiatives, such as the European Energy Programme for Recovery and the use of the 300 million EU Allowances set aside under the ETS for demonstration projects.

In implementing the SET-Plan, we will progressively move away from the current paradigm of financing individual projects to one of co-investing in programmes. Combining public resources effectively and creating flexible Public-Private Partnerships with industry should be the future model for pan-European energy research cooperation.

Such an approach calls for effective Public-Private Partnerships that, while fully protecting the public financial interests, strike the right balance between control and risk and are flexible enough to permit an efficient cooperation with the private players.

At the same time, in order to mobilise sufficient resources to finance large-scale demonstrations, we will look for new ways to combine resources from different actors and instruments, such as grants, loans and loan guarantees. The European Investment Bank (EIB) could play a pivotal role in improving the coordination and continuity of available funding, as illustrated by the Risk Sharing Finance Facility (RSFF) which combines resources from the FP7 budget with those of the EIB to finance higher-risk R&D projects, including in the energy sector.

In the medium and longer term, the EU should develop a framework to ensure a more significant, predictable and stable financing approach for the development of low carbon technologies. This would: enhance the coherence between existing and new actions; increase the effectiveness of our policies; gain focus and adequacy to the purpose; enhance transparency and avoid overlaps; and facilitate the comprehension of our actions by stakeholders and European citizens.

Actions with the European Investment Bank (EIB) – mobilising the financial community

EIB lending has the ability to mobilise and leverage other public and private sector resources. In the framework of its response to the financial crisis and as set out in the European Economic Recovery Plan¹⁷, it has increased its lending target in the energy field to €9.5bn in 2009 and €10.25bn in 2010, a significant enhancement compared to the €6.5bn target in 2008.

On this basis, the Commission and the EIB are working together on the following initiatives which will enable the Bank to target the increased lending to finance the SET-Plan:

- To reinforce the RSFF in order to allow it to support the SET-Plan. In particular, it will be necessary to assess its risk-capital base in order to deliver the scale of finance required to achieve the objectives of the Technology Roadmaps by 2020. This assessment should be included in the mid-term review of the RSFF.

¹⁷ COM(2008) 800, 26.11.2008.

- To significantly increase resources to the "2020 European Fund for Energy, Climate Change and Infrastructure" (the Marguerite Fund), set up by the EIB and other public long-term financing institutions from the Member States.
- To develop a dedicated joint energy efficiency and renewable energy instrument to finance the initial market take-up of low carbon technologies. As a pilot joint Commission-EIB initiative, a EUR 15 million instrument providing technical assistance to local authorities for the development of bankable projects under their sustainable energy action plans is being launched in 2009¹⁸.
- To increase EU support for venture capital markets, particularly to encourage increased investment in low carbon technologies through the High Growth and Innovative SME Facility (GIF) under the Competitiveness and Innovation Programme (CIP).
- To assess the optimal financial packages for large demonstration or market replication projects, including potential blending of grants with loans or risk-sharing products.
- To establish stronger links between the EIB and the European Community Steering Group on Strategic Energy Technologies, if appropriate by inviting the EIB to participate in its work.

6. CONCLUSIONS

Moving towards a low carbon economy needs new technology to be conceived, tested, and then deployed. To make this happen, the EU has given policy direction through the comprehensive policy framework proposed in the energy and climate package. The SET-Plan is the technology development pillar. Now, the private sector has to take up the challenge, secure in the knowledge that they will have public support when the risks are too high because of the importance of delivering a low carbon economy.

It is now clear that public and private investment in energy technology development has to increase substantially – starting immediately. An injection of public finance is fully justified to achieve public policy goals and help overcome market failures. Stronger intervention at EU level could be one of the most effective ways to bring forward the desired broad portfolio of technologies.

The Commission therefore calls on the Council and Parliament to:

- Support the Technology Roadmaps 2010-2020, and, on this basis, invite the Commission to launch the European Industrial Initiatives in 2010.
- Agree to focus existing Community programmes to support the SET-Plan initiatives.
- Invite Member States to increase their efforts to support the financing of low carbon technologies, including through an appropriate focus of support instruments; and to contribute to the implementation of the SET-Plan initiatives according to a variable

¹⁸ The Sustainable Energy Financing Initiative of the European Economic Recovery Plan, financed through the Intelligent Energy – Europe II Programme.

geometry joint programming approach in which sovereignty over national research funding is preserved.

- Welcome the proposed reinforcement of financial instruments involving the EIB Group, such as the RSFF, the Marguerite Fund and the High Growth and Innovative SME Facility (GIF), to contribute to the financing of the SET-Plan.
- Welcome the intention of the Commission and the EIB to assess the optimal financial packages for large demonstrations and market replication projects; and to develop a dedicated joint energy efficiency and renewable energy instrument to finance the initial market take-up of low carbon technologies; and welcome the Commission's ideas for the medium term to drive forward the financing of low carbon technologies.
- Agree to strengthen ongoing and new international technology-oriented initiatives.