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**WHITE PAPER**

**Adapting to climate change: Towards a European framework for action**

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## 1. INTRODUCTION

Climate change increases land and sea temperatures and alters precipitation quantity and patterns, resulting in the increase of global average sea level, risks of coastal erosion and an expected increase in the severity of weather-related natural disasters. Changing water levels, temperatures and flow will in turn affect food supply, health, industry, and transport and ecosystem integrity. Climate change will lead to significant economic and social impacts with some regions and sectors likely to bear greater adverse affects. Certain sections of society (the elderly, disabled, low-income households) are also expected to suffer more.

Addressing climate change requires two types of response. Firstly, and importantly, we must reduce our greenhouse gas emissions (GHG) (i.e. take mitigation action) and secondly we must take adaptation action to deal with the unavoidable impacts. The EU's recently agreed climate change legislation puts in place the concrete measures to reach the EU's commitment to reduce emissions to 20% below 1990 levels by 2020 and is capable of being amended to deliver a 30% reduction if agreed as part of an international agreement in which other developed countries agree to comparable reductions and appropriate contributions by economically more advanced developing countries based on their responsibilities and capabilities. However, even if the world succeeds in limiting and then reducing GHG emissions, our planet will take time to recover from the greenhouse gases already in the atmosphere. Thus we will be faced with the impact of climate change for at least the next 50 years. We need therefore to take measures to adapt.

Adaptation is already taking place but in a piecemeal manner. A more strategic approach is needed to ensure that timely and effective adaptation measures are taken, ensuring coherency across different sectors and levels of governance.

This White Paper sets out a framework to reduce the EU's vulnerability to the impact of climate change. It builds on the wide-ranging consultation launched in 2007 by the Green Paper on Adapting to Climate Change in Europe<sup>1</sup> and further research efforts that identified action to be taken in the short-term. The framework is designed to evolve as further evidence becomes available. It will complement action by Member States and support wider international efforts to adapt to climate change, particularly in developing countries. The EU is working with other partner countries in the UNFCCC<sup>2</sup> towards a post-2012 climate agreement which will address adaptation as well as mitigation. The Commission's proposals in this context are set out in the Communication entitled "Towards a comprehensive climate change agreement in Copenhagen"<sup>3</sup>.

Enhancing the EU's resilience to the impacts of climate change also means the chance to invest in a low-carbon economy, for instance, by promoting energy efficiency and the uptake of green products. This is one of the key objectives of the European Economic Recovery Plan, which outlines the EU's response to the economic crisis, leading us to a creative, knowledge-based economy. At the same time, we can facilitate structural changes through the modernisation of European infrastructure and enhance the competitiveness of our economy.

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<sup>1</sup> COM(2007) 354.

<sup>2</sup> United Nations Framework Convention on Climate Change.

<sup>3</sup> COM(2009) 39, 28.1.2009.

Developing this framework has been a cross-cutting exercise and this white paper is accompanied by three sectoral papers on agriculture<sup>4</sup>, health<sup>5</sup> and water, coasts and marine issues<sup>6</sup>. Further sectoral papers may be presented in the future.

## 2. WHY DO WE NEED AN ADAPTATION STRATEGY? WHY AT EU LEVEL?

### 2.1 The impact of a changing climate

The severity of the impacts of climate change varies by region. The most vulnerable regions in Europe are Southern Europe, the Mediterranean Basin, Outermost regions and the Arctic. Furthermore, mountain areas in particular the Alps, islands, coastal and urban areas and densely populated floodplains are facing particular problems. Outside Europe, developing countries (including small island states) will remain particularly vulnerable.

Climate change will impact a number of sectors. In **agriculture** projected climatic changes will affect crop yields, livestock management and the location of production. The increasing likelihood and severity of extreme weather events will considerably increase the risk of crop failure. Climate change will also affect soil by depleting organic matter – a major contributor to soil fertility. The effects of climate change on **forests** are likely to include changes in forest health and productivity and changes to the geographic range of certain tree species. Climate change will be an added stress for the **fisheries and aquaculture sectors**. **Effects will also be severe on coasts and marine ecosystems**. Coastal erosion rates will increase and existing defences may provide insufficient protection. In this context, islands and outermost regions deserve special consideration.

In the **energy** sector, climate change will have a direct effect on both the supply and demand of energy. The projected impact of climate change on precipitation and glacier melt indicate that hydropower production could increase by 5% or more in northern Europe and decrease by 25% or more in southern Europe<sup>7</sup>. Decreased precipitation and heat waves are also expected to influence negatively the cooling process of thermal power plants. On the demand side, increasing summer peaks for cooling and impacts from extreme weather events will affect in particular electricity distribution.

Extreme climate events cause huge economic and social impacts. **Infrastructure** (buildings, transport, energy and water supply) is affected, posing a specific threat to densely populated areas. The situation could be exacerbated by the rise in sea level. A more strategic and long-term approach to spatial planning will be necessary, both on land and on marine areas, including in transport, regional development, industry, tourism and energy policies.

**Tourism** is likely to suffer from decreasing snow cover in Alpine areas and from increasing temperatures in Mediterranean regions. Unsustainable forms of tourism can exacerbate the negative effects of climate change.

Changing weather conditions will also have profound effects on **human health** and on **animal and plant health**. As extreme events become more frequent, weather-related deaths

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<sup>4</sup> SEC(2009)417.

<sup>5</sup> SEC(2009)416

<sup>6</sup> SEC(2009)386

<sup>7</sup> EEA-JRC-WHO — Impacts of Europe's Changing Climate — 2008 Indicator-based assessment Report 4/2008.

and diseases could rise. Climate change could also increase the spread of serious infectious vector-borne transmissible diseases including zoonoses<sup>8</sup>. Climate change will threaten animal wellbeing and could also impact plant health, favouring new or migrant harmful organisms, which could adversely affect trade in animals, plants and their products.

Climate change will cause significant changes in the quality and availability of **water resources**, affecting many sectors including food production, where water plays a crucial role. More than 80% of agricultural land is rain-fed. Food production also depends on available water resources for irrigation. Limited water availability already poses a problem in many parts of Europe and the situation is likely to deteriorate further due to climate change, with Europe's high water stress areas expected to increase from 19% today to 35% by the 2070s. This could also increase migration pressures.

Climate change will increasingly drive **ecosystem including marine ecosystems** and **biodiversity** loss, affecting individual species and significantly impacting ecosystems and their related services, on which society depends. Ecosystems play a direct role in climate regulation with peat lands, wetlands and the deep sea providing significant storage for carbon. In addition, salt marsh ecosystems and dunes provide protection against storms. Other ecosystem services will also be affected such as the provision of drinking water, food production and building materials and oceans can deteriorate through acidification. Some land use practices and planning decisions (e.g. construction on flood plains), as well as unsustainable use of the sea (e.g. overfishing) have rendered ecosystems and socioeconomic systems more vulnerable to climate change and thus less capable of adapting.

The **challenge for policy-makers** is to understand these climate change impacts and to develop and implement policies to ensure an optimal level of adaptation. Strategies focused on managing and conserving water, land and biological resources to maintain and restore healthy, effectively functioning and climate change-resilient ecosystems are one way to deal with the impact and can also contribute to the prevention of disaster as addressed in a recent Commission Communication<sup>9</sup>. Evidence<sup>10</sup> suggests that working with nature's capacity to absorb or control impact in urban and rural areas can be a more efficient way of adapting than simply focusing on physical infrastructure. Green Infrastructure<sup>11</sup> can play a crucial role in adaptation in providing essential resources for social and economic purposes under extreme climatic conditions. Examples include improving the soil's carbon and water storage capacity, and conserving water in natural systems to alleviate the effect of droughts and to prevent floods, soil erosion and desertification.

***Action (EU and Member States)***

- To promote strategies which increase the resilience to climate change of health, property and the productive functions of land, inter alia by improving the management of water resources and ecosystems.

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<sup>8</sup> Zoonoses are diseases that can be transmitted from animals to humans.

<sup>9</sup> COM(2009) 82 : A Community approach on the prevention of natural and man-made disasters.

<sup>10</sup> See Impact Assessment, the Green Infrastructure Approach, chapter 4.1, page 29.

<sup>11</sup> Green Infrastructure is the interconnected network of natural areas including some agricultural land, such as greenways, wetlands, parks, forest preserves and native plant communities, and marine areas that naturally regulate storm flows, temperatures, flooding risk, and water, air and ecosystem quality.

## 2.2 The economic case for a strategic approach to adaptation

Some individuals or businesses (insectors, such as agriculture and tourism) may be able to respond to market signals or environmental changes brought about by climate change ('autonomous adaptation'). However, this autonomous adaptation is unlikely to be optimal because of uncertainty, imperfect information or indeed financial constraints. This means that we cannot leave adaptation efforts to individuals or businesses.

In addition, some adaptation actions that are taken may increase vulnerability rather than reduce it. Some examples of this "mal-adaptation" are sea level rise or flood protection infrastructure that may disturb the natural dynamic nature of coastal and river systems, or cooling or water supply technologies that may increase energy consumption.

Preventive action brings clear economic, environmental and social benefits by anticipating potential impacts and minimising threats to ecosystems, human health, economy and infrastructure. Although more specific information on the costs of adaptation is needed, several sources<sup>12</sup> already indicate that the costs of taking action to address climate change (including mitigation and adaptation measures) will be much lower than the costs of inaction over the medium to long term.

## 2.3 Why is action needed at EU level?

Due to the regional variability and severity of climate impact most adaptation measures will be taken at national, regional or local level. However these measures can be supported and strengthened by an integrated and coordinated approach at EU level.

The EU has a particularly strong role when the impact of climate change transcends the boundaries of individual countries (e.g. river and sea basins and bio-geographic regions). Adaptation will require solidarity<sup>13</sup> among EU Member States to ensure that disadvantaged regions and regions most affected by climate change will be capable of taking the measures needed to adapt. Moreover, coordinated EU action will be necessary in certain sectors (e.g. agriculture, water, biodiversity, fisheries, and energy networks) that are closely integrated at EU level through the single market and common policies.

Article 4 of the UNFCCC<sup>14</sup> stipulates that every effort must be made to adopt national or regional adaptation strategies. While a number of EU Member States have prepared national adaptation strategies, others have yet to do so. The EU is well placed to facilitate coordination and the exchange of best practices between Member States on climate.

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<sup>12</sup> Economic Aspects of Adaptation to Climate Change (OECD, 2008) and The Stern Review on the Economics of Climate Change, (HM Treasury, 2006).

<sup>13</sup> Article 2 of the EU Treaties.

<sup>14</sup> Article 4 stipulates that All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances shall ... (b)...Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and measures to facilitate adequate adaptation to climate change.

### 3. THE PROPOSED EU FRAMEWORK: OBJECTIVES AND ACTION

The **objective** of the EU's Adaptation Framework is to improve the EU's resilience to deal with the impact of climate change. The framework will respect the principle of subsidiarity and support overarching EU objectives on sustainable development.

The EU's framework adopts a phased approach. The intention is that phase 1 (2009-2012) will lay the ground work for preparing a comprehensive EU adaptation strategy to be implemented during phase 2, commencing in 2013.

Phase 1 will focus on four pillars of action: 1) building a solid knowledge base on the impact and consequences of climate change for the EU, 2) integrating adaptation into EU key policy areas; 3) employing a combination of policy instruments (market-based instruments, guidelines, public-private partnerships) to ensure effective delivery of adaptation and 4) stepping up international cooperation on adaptation. For phase 1 to be a success, the EU, national, regional and local authorities must cooperate closely.

The proposals set out in this paper cover actions to be taken in the first phase and are without prejudice to the future structure of the EU budget and to the current and future multi-annual financial framework.

#### 3.1 Developing the knowledge base

To be able to take decisions on how best to adapt, it is essential to have access to reliable data on the likely impact of climate change, the associated socio-economic aspects and the costs and benefits of different adaptation options. More knowledge is needed on climate impact and vulnerability so that appropriate policy responses can be developed. The knowledge generated on adaptation should also be made available to other countries, in particular developing countries.

A considerable amount of information and research already exists, but is not shared across Member States. An effective way to improve knowledge management would be to establish a **Clearing House Mechanism** as an IT tool and database on climate change impact, vulnerability and best practices on adaptation. The Clearing House Mechanism would contribute to the Shared Environmental Information System<sup>15</sup>, the collaborative initiative by the European Commission and the European Environment Agency (EEA) to establish with the Member States an integrated and shared EU-wide environmental information system<sup>16</sup>. The Clearing House Mechanism would also rely on geographical information provided by the Global Monitoring for Environment and Security (GMES).

A pro-active research and education policy is necessary to promote better understanding of climate change impacts and the development of skills, methods and technologies to cope with the consequences of climate. A recent Commission Staff Working Document<sup>17</sup> provides detailed information on research needs, including on the impacts of climate change and

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<sup>15</sup> COM(2008) 46.

<sup>16</sup> The Clearing House Mechanism would be linked to other data repositories such as the European Marine Observation and Data Network, the Droughts Observatory, the European Forest Fire Information System, EuroHeat (heat-wave probability tool). It will require the full support and active participation of Member States. Other organisations such as the European Institute of Innovation and Technology could contribute to the Clearing House Mechanism.

<sup>17</sup> Commission Staff Working Document SEC(2008) 3104.



adaptation. Moreover, climate change will be an important issue for the recently inaugurated European Institute of Innovation and Technology which is setting up a Knowledge and Innovation Community on climate change and adaptation.

Methods, models, data sets and prediction tools, which can be enabled by information and communication technologies, assist in understanding and forecasting climate impact, in identifying vulnerabilities and in developing appropriate adaptation measures. Further work is necessary to develop these tools. In cooperation with the Member States, vulnerability must be assessed against a wide range of climate scenarios and on different geographical scales so that adaptation measures can be defined as precisely as possible. The Commission is currently examining ways to improve the monitoring of impacts and adaptation measures in order to develop vulnerability indicators. More quantified information on the costs and benefits of adaptation is also urgently needed.

In addition, coordination should be enhanced where Member States spearhead important adaptation research.

#### *Action (EU and Member States)*

- Take the necessary steps to establish by 2011 a Clearing House Mechanism
- Develop methods, models, data sets and prediction tools by 2011
- Develop indicators to better monitor the impact of climate change, including vulnerability impacts, and progress on adaptation by 2011
- Assess the cost and benefit of adaptation options by 2011

### **3.2 Integrating adaptation into EU policies**

Adaptation needs to be **mainstreamed** into EU policies. This exercise has to be carefully prepared, based on solid scientific and economic analysis. In each policy area there should be a review of how policies could be re-focused or amended to facilitate adaptation. Adaptation options will vary by sector and will, in some cases, require financing. For each sector, further work needs to be done to improve understanding of the impact of climate change, assess appropriate responses and secure the necessary funding. This review should commence during Phase 1(2009-2012).

In each policy area, the following key questions must be answered:

- What are the actual and potential impacts of climate change in the sector?
- What are the costs of action/inaction?
- How do proposed measures impact upon and interact with policies in other sectors?

Notwithstanding these questions, in view of the projected impact, particularly on key EU policy sectors, early action on adaptation is essential. The sectors below are those with strong EU policy involvement for which adaptation strategies outlining the types of action are needed. Priority should be given to adaptation measures that would generate net social and/or economic benefits irrespective of uncertainty in future forecasts (no-regret measures). Priority should also be given to measures that are beneficial for both mitigation and adaptation.

### 3.2.1 *Increasing the resilience of health and social policies*

The EU Health Strategy<sup>18</sup> foresees action on adaptation. While main policy actions should be taken by the Member States, the EU should use measures to assist Member States under the EU Health Programme<sup>19</sup> and through other means in accordance with article 152 of the Treaty<sup>20</sup>. It should explore with the WHO and EU agencies ways of ensuring adequate surveillance and control of the impact of climate change on health, such as epidemiological surveillance, the control of communicable diseases and the effect of extreme events. Further details are provided in a specific working document on health and adaptation to climate change.

The impact on animal health will need to be addressed principally at farm level but also in relation to animal population density in certain regions and current movement patterns of live animals. The Community Animal Health Strategy<sup>21</sup> aims to prioritise disease control, improve data gathering and step up existing animal disease surveillance. It focuses on disease prevention such as bio-security rather than reactive measures and will consider how climate change affects the occurrence of diseases.

In the social domain, there is mounting evidence that those who have fewer resources are more vulnerable to climate change effects. It is vital for the success of adaptation policies that they distribute the burdens equitably and that impacts on jobs and on the quality of life of low-income groups are taken into account. The social dimension of adaptation policies needs to be pursued within existing EU processes in the social and employment fields, and all social partners need to be involved.

#### ***Action (EU and Member States)***

- Develop guidelines and surveillance mechanisms on the health impacts of climate change by 2011.
- Step up existing animal disease surveillance and control systems.
- Assess the impacts of climate change and adaptation policies on employment and on the well-being of vulnerable social groups.

### 3.2.2 *Increasing the resilience of agriculture and forests*

As the majority of land in the EU is managed by farmers, the CAP is well placed to play a central role in contributing to adaptation, not only by helping farmers to adapt their production to the changing climate situation, but also by helping provide wider ecosystem services dependant on specific land management. In this sense, Member States should be encouraged to embed climate change adaptation in the three strands of rural development aimed at improving competitiveness, the environment, and the quality of life in rural areas. In addition, the applicability of measures on a territorial scale beyond the farm level could be examined. The Farm Advisory System could be used to disseminate knowledge and

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<sup>18</sup> Health Strategy White Paper COM(2007)630

<sup>19</sup> Decision N° 1350/2007/EC, 23.10.2007, OJ L301

<sup>20</sup> Article 152 states that "a high level of human health protection shall be ensured in the definition and implementation of all community policies and activities.

<sup>21</sup> COM(2007) 539.

encourage the adoption of new farm management methods and technologies that facilitate climate change adaptation.

More generally, consideration should be given to the CAP providing an adequate framework for sustainable production, thereby enabling the agricultural sector to deal with the challenges posed by changing climatic conditions. This will involve, inter alia, assessing which water quantity and quality requirements should be further integrated into relevant CAP instruments as well as improving the efficiency of water use by agriculture especially in water stress regions. A reflection on possible support for farms which are particularly vulnerable to the impacts of climate change could also be undertaken. Further details are provided in a specific working document on agriculture and adaptation to climate change. In any case, the possible contribution of the CAP to adaptation to climate change will also have to be examined in the context of the review of the CAP after 2013.

As regards forests, the EU forestry strategy could be updated on climate-related aspects; in the framework of the EU Forest Action Plan a debate should be launched on the options for an EU approach on forest protection and forest information systems.

***Action (EU and Member States)***

- Ensure that measures for adaptation and water management are embedded in rural development national strategies and programmes for 2007-2013
- Consider how adaptation can be integrated into the 3 strands of rural development and give adequate support for sustainable production including how the CAP contributes to the efficient use of water in agriculture
- Examine the capacity of the Farm Advisory System to reinforce training, knowledge and adoption of new technologies that facilitate adaptation
- Update forestry strategy and launch debate on options for an EU approach on forest protection and forest information systems

**3.2.3 *Increasing the resilience of biodiversity, ecosystems and water***

Ecosystem services such as carbon sequestration, flood protection and protection against soil erosion are directly linked to climate change and healthy ecosystems are an essential defence against some its most extreme impacts. A comprehensive and integrated approach towards the maintenance and enhancement of ecosystems and the goods and services they provide is needed. A number of Member States have developed initiatives designed to protect their land-based and water infrastructure. Greater co-ordination at EU level could deliver additional benefits.

Regarding water, a number of existing EU policies contribute to adaptation efforts. In particular, the Water Framework Directive<sup>22</sup> establishes a legal framework to protect and restore clean water across Europe by 2015 and to ensure the long-term sustainable use of water. The River Basin Management Plans due in 2009 under the Directive will take into account the impacts of climate change and the next generation of plans due in 2015 should be fully climate-proofed. In addition, climate change must also be properly integrated in the

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<sup>22</sup> Directive 2000/60/EC.

implementation of the Floods Directive<sup>23</sup>. Full implementation of this Directive by the EU Member States will help increase resilience and facilitate adaptation efforts.

For water scarcity, the Commission will assess the need to further regulate the standards of water using equipment and water performance in agriculture, households and buildings. When reviewing in 2012 the implementation of the Water Framework Directive and the Water Scarcity and Droughts strategy<sup>24</sup>, options for boosting the water storage capacity of ecosystems to increase drought resilience and reduce flood risks should be evaluated. A more detailed account of water issues is provided in the accompanying document.

Regarding habitats, the impact of climate change must also be factored into the management of Natura 2000<sup>25</sup> to ensure the diversity of and connectivity between natural areas and to allow for species migration and survival when climate conditions change. In future it may be necessary to consider establishing a permeable landscape in order to enhance the interconnectivity of natural areas.

***Action (EU and Member States)***

- Explore the possibilities to improve policies and develop measures which address biodiversity loss and climate change in an integrated manner to fully exploit co-benefits and avoid ecosystem feedbacks that accelerate global warming
- Develop guidelines and a set of tools (guidance and exchange of best practices) by the end of 2009 to ensure that the River Basin Management Plans (RBMP) are climate-proofed
- Ensure that climate change is taken into account in the implementation of the Floods Directive.
- Assess the need for further measures to enhance water efficiency in agriculture, households and buildings
- Explore the potential for policies and measures to boost ecosystem storage capacity for water in Europe
- Draft guidelines by 2010 on dealing with the impact of climate change on the management of Natura 2000 sites

***3.2.4 Increasing the resilience of coastal and marine areas***

Climate change must also be properly integrated in the implementation of the Marine Strategy Framework Directive<sup>26</sup> which requires the achievement of good environmental status of the EU's marine waters by 2020. Full implementation of this Directive will help increase resilience in the marine environment and facilitate adaptation efforts.

A more coherent and integrated approach to maritime and coastal planning and management is also necessary. The Integrated Maritime Policy will provide a comprehensive framework to

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<sup>23</sup> Directive 2007/60/EC.

<sup>24</sup> COM(2007) 414 final

<sup>25</sup> Natura 2000 is an EU wide network of nature conservation areas established under the EU nature directives.

<sup>26</sup> Directive 2008/56/EC

integrate adaptation efforts coherently into sectoral and specific policies and measures. Efforts must be stepped up to ensure that the provisions in the Integrated Coastal Zone Management (ICZM) Recommendation<sup>27</sup> are fully respected and strengthened. The follow-up to the Roadmap for Maritime Spatial Planning<sup>28</sup> will incorporate adaptation to climate change in maritime and coastal management. A more detailed account of climate change and marine and coastal issues is provided in the accompanying document.

Climate change is also an additional pressure on European fisheries and should be taken into account with a view to ensuring long-term sustainability in the future reformed Common Fisheries Policy.

In order to ensure a coordinated and integrated approach to adaptation in coastal and marine areas and to take into account trans-boundary issues, the Commission will develop guidelines on best adaptation practices in coastal and marine areas.

- *Action (EU and Member States)*
- Ensure that adaptation in coastal and marine areas is taken into account in the framework of the Integrated Maritime Policy, in the implementation of the Marine Strategy Framework Directive and in the reform of the Common Fisheries Policy.
- Develop European guidelines on adaptation in coastal and marine areas

### 3.2.5 *Increasing the resilience of production systems and physical infrastructure*

Protecting existing and future infrastructure from the impact of climate change will be predominantly a Member State responsibility. The EU nevertheless has an important role in promoting best practice, via support for infrastructure development and also in developing standards for construction<sup>29</sup>. Improving the resilience of existing transport infrastructure and energy networks requires a common and coordinated approach for assessing the vulnerability of critical infrastructure to extreme weather events. This provides a basis for strategic choices regarding networks, back-ups and energy security, and for maintaining stable transport networks and services. Adaptation should be considered in the Strategic Energy Review process. Infrastructure projects which receive EU funding should take climate-proofing into account based on methodologies to be developed. These methodologies would then be incorporated into the TEN-T<sup>30</sup>, TEN-E<sup>31</sup> guidelines and EU Cohesion Policy. The implications of making a climate impact assessment a condition for public and private investment will be explored, as will the feasibility of incorporating sustainability criteria — including taking into account climate change — into harmonised standards for construction, with for example a possible widening or extension of the existing Eurocodes. In addition, the

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<sup>27</sup> Recommendation of 30 May 2002

<sup>28</sup> COM(2008) 791

<sup>29</sup> The Eurocodes are a set of unified international codes of practice for designing buildings and civil engineering structures, which will eventually replace national codes. See Commission Recommendation 2003/887/EC.

<sup>30</sup> Trans-European Network for Transport Program. The vulnerability of the TEN-T to climate change and the need for potential adaptation measures is part of the debate launched by the European Commission with the adoption on 4 February 2009 of the Green Paper on 'TEN-T: A policy review', COM(2009)44 final.

<sup>31</sup> Trans-European Energy Networks. See Green Paper "Towards a secure, sustainable and competitive European energy network", COM (2008)782 final.

Commission will work with Member States and stakeholders setting guidelines and exchanging good practice, to ensure that account is taken of climate change impacts when implementing the Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) Directives and spatial planning policies.

**Action (EU and Member States)**

- Take account of climate change impacts in the Strategic Energy Review process
- Develop methodologies for climate-proofing infrastructure projects and consider how these could be incorporated into the TEN-T and TEN-E guidelines and guidance on investments under Cohesion policy in the current period
- Explore the possibility of making climate impact assessment a condition for public and private investment
- Assess the feasibility of incorporating climate impacts into construction standards, such as Eurocodes
- Develop guidelines by 2011 to ensure that climate impacts are taken into account in the EIA and SEA Directives

#### **4. INSTRUMENTS - FINANCING**

The Stern Review identified financial constraints as one of the main barriers to adaptation. Climate change is one of the priorities for the current multi-annual financial framework (2007-2013) and it is important to ensure that the available funds are used to reflect this priority. There is scope for improving the uptake of adaptation action by Member States and for targeting better the use of available financial resources and instruments. Attention should be paid to ensuring that public funding and state aid do not foster mal-adaptation.

The recently adopted European Economic Recovery Plan (EERP) contains a number of proposals relating to climate change investments. Examples include modernising European infrastructure, promoting energy efficiency in buildings and the uptake of green products<sup>32</sup>. These proposals will facilitate further adaptation to climate change and their results will be evaluated to determine future needs. Member States considering investment in infrastructure as a response to the economic crisis should ensure that resulting initiatives take adaptation needs fully into consideration.

In the coming years it is essential that relevant sectors develop strategies and cost estimates for adaptive actions so that they may be taken into account in future financial decisions.

Optimising the use of insurance and other financial services products could also be explored. It should be evaluated whether certain private actors/sectors (such as those providing public services, critical infrastructure) need to be covered by compulsory standard weather-related insurance. In cases where insurance is not available, for example for buildings located in flood plains, publicly supported insurance schemes may be required. Due to the cross-border effects of climate change, there may be benefits in promoting EU-wide insurance as opposed to national or regional schemes.

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<sup>32</sup> Green VAT, environmental performance requirements, measures for energy savings.

In any adaptation framework, consideration should be given to the role of specialised Market Based Instruments (MBIs) and public-private partnerships should be encouraged with a view to the sharing of investment, risk, reward and responsibilities between the public and private sector in the delivery of adaptation action. Examples of MBIs include incentive schemes for protecting ecosystem services or for projects enhancing the resilience of ecosystems and economic sectors in the form of Payments for Ecosystem Services (PES).

The possibility of using revenue generated from auctioning allowances under the Community greenhouse gas emission allowance trading system (the EU ETS) for adaptation purposes should be utilised. The revised Directive governing the scheme from 2013<sup>33</sup> provides that at least 50% of the revenue generated from auctioning allowances should be used, inter alia for adaptation in Member States and developing countries. This additional revenue will be crucial for sharing adaptation costs between the public and private sector.

***Action (EU and Member States)***

- Estimate adaptation costs for relevant policy areas so that they can be taken into account in future financial decisions
- Further examine the potential use of innovative funding measures for adaptation
- Explore the potential for insurance and other financial products to complement adaptation measures and to function as risk sharing instruments
- Encourage Member States to utilise the EU's ETS revenues for adaptation purposes

## **5. WORKING IN PARTNERSHIP WITH THE MEMBER STATES**

To support cooperation on adaptation and with a view to taking this framework forward, the Commission intends to set up an Impact and Adaptation Steering Group (IASG) and provide the secretariat (after the usual evaluation of the organisational and resources impact of this action). This group will be composed of representatives from the EU Member States involved in the formulation of national and regional adaptation programmes and will consult with representatives from civil society and the scientific community.

The Steering Group will be supported by a number of technical groups, who will deal specifically with developments in key sectors (agriculture and forestry, biodiversity, water, oceans and seas, energy, health etc.).

The Steering Group will play a role in developing the four pillars identified above to help develop the EU strategy and prepare national adaptation strategies by the Member States. The Steering Group will also consider the appropriate level at which action should be best implemented.

In the initial phase the Steering Group will focus on monitoring progress in strengthening the knowledge base, in particular setting up the Clearing House Mechanism. The Steering Group will provide a coordinated approach to building the evidence base on the impact of climate change, assessing the risks of climate change for the EU, the scope for increasing climate resilience and costing risks and opportunities.

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<sup>33</sup> To be adopted in 2009.

### *Action (EU and Member States)*

- Take a decision to establish by 1 September 2009 an Impact and Adaptation Steering Group (IASG) to step up cooperation on adaptation
- Encourage the further development of National and Regional Adaptation Strategies with a view to considering mandatory adaptation strategies from 2012

## **6. EXTERNAL DIMENSION AND ONGOING WORK UNDER THE UNFCCC**

Many countries are already enduring the impact of climate change and there is an urgent need to work with them, in particular with neighbouring countries and the most vulnerable developing countries, to improve their resilience and capacity to adapt to adverse effects. Adaptation should be mainstreamed in all of the EU's external policies. In trade policy adaptation should be incorporated, notably through the liberalisation of trade in environmental goods and services and in the elaboration of Free Trade Agreements (FTAs). There is a huge potential for green trade which can contribute to enhancing growth and creating jobs. The EU should explore this and the related mutual benefits in the relationship with key partners.

EU external cooperation should make a significant contribution to promoting adaptation in partner countries. Bilateral and regional financial assistance programmes will aim to integrate adaptation considerations into all relevant sectors. The ongoing review of the EU Environment Integration Strategy will be a good opportunity to emphasise the need for integrating adaptation needs, as will the Mid-Term Review of EC cooperation strategies.

With a view to supporting adaptation in developing countries, the EU is working with developing countries to facilitate effective adaptation policies. The Global Climate Change Alliance (GCCA) was launched in 2008. Through the GCCA and other programmes the EU will support developing countries in particular Least Developed Countries and Small Island Developing States.

In the UNFCCC, the EU has tabled ambitious proposals to foster adaptation in a post-2012 global agreement, notably via the comprehensive **Framework for Action on Adaptation (FAA)**<sup>34</sup>.

External EU policy should also make a substantial contribution to adaptation, via water management (the EU Water Initiative and the EU-ACP Water Facility), agriculture, biodiversity, forests, desertification energy, health, social policy (including gender issues), research, coastal erosion, and disaster risk reduction<sup>35</sup>, the latter is an essential part of successful adaptation.

Failure to adapt could have security implications. The EU is therefore strengthening its analysis and early warning systems and integrating climate change into existing tools such as conflict prevention mechanisms and security sector reform. The effects of climate change on

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<sup>34</sup> The various elements of the EU's Framework for action on Adaptation (FAA) are described in the Communication Towards a comprehensive climate change agreement in Copenhagen, COM(2009) 39, 28.01.2009.

<sup>35</sup> Communication on EU Strategy supporting Disaster Risk Reduction in Developing Countries, COM(2009)82.



migratory flows should also be considered in the broader EU reflection on security, development and migration policies.

***Action (EU and Member States)***

- Step-up efforts to mainstream adaptation into all EU external policies
- Strengthen dialogue with partner countries on adaptation issues
- Take the Framework for Action on Adaptation forward in the UNFCCC

**7. CONCLUSIONS - NEXT STEPS**

Adaptation will be a long and continuous process. It will operate at all levels and require close coordination with stakeholders. The EU will support international and national adaptation efforts ensuring that there are adequate resources for efficient and cost-effective adaptation action to provide a sustainable and sound economic basis for future generations. The Commission will regularly review progress in implementing the first phase of the framework for action identified in this White Paper with a view to developing a comprehensive adaptation strategy from 2013.