GREEN INFRASTRUCTURE IMPLEMENTATION AND EFFICIENCY

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Annex VI: Detailed Policy Area Specific Changes

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1 DETAILED CHANGES SORTED BY OPTION & CHANGE

1.1 Option 2

1.1.1 2b) Wider EU support for investments in GI

2b) Wider EU support for investments in GI
⇨ **Concrete policy knock-on effects in specific policy areas**
Forestry
Change 2b) Public investment: Encourage Member States to use the CAP Pillar 2 funds (EAFRD) for forestry measures and increase their uptake. In particular the actions under the forest-environment measure, agro-forestry, non-productive investments on forest land, and well designed actions for afforestation and restoration of the potential of forestry potential to support climate change adaptation, in view of increase risk of extreme weather events such as forest fires and storms, should be encouraged.
Biodiversity and nature conservation
Change 2 b) Infrastructure, especially given that Green Infrastructure contributes to meeting objectives set in multiple policy areas. Also under **LIFE+,** demonstration projects which rely on Green Infrastructure (ecosystem based solutions) to deliver environmental objectives have priority over projects which deliver the same objectives through other means. Increased use of LIFE funds for capacity building on issues concerning Natura 2000 coherence and wider connectivity issues; Increase in LIFE+ biodiversity funding, with an earmarked budget for Natura 2000 coherence measures as part of a Prioritised Action Framework (PAF); The new climate change component of LIFE+ which is proposed for the 2014 - 2020 period will provide financing in three strands: mitigation, adaptation and governance/awareness. The aim is to provide 'seed money' which can catalyse innovative solutions to climate change issues (including ecosystem-based mitigation and adaptation options). The focus will be on testing demonstration projects which can then be replicated under larger funds such as EAFRD and Cohesion Policy.
Water Policy
Change 2b) Public investments: Natural water retention measures are recognised as offering the potential for cost savings and multifunctional benefits. Such measures are applied in pilot projects in Member States, primarily funded under Cohesion Policy in urban areas and the EAFRD in rural areas (see Cohesion Policy and agriculture). Water authorities in charge of developing and implementing the River Basin Management Plans may receive support from Cohesion Policy funds for the active purchase of land to re-establish ecological continuity and develop blue infrastructure measures. In rural areas, ecosystem-based approaches for water treatment and purification should be equally considered in rural development programmes and project feasibility studies. Ecosystem-based water purification projects can be prioritised through project selection criteria that are favourable to Green Infrastructure. The management of purchased land can then be set within the framework of long term leases. Authorities in charge of implementing the River Basin Management Plans are encouraged to draft Multiannual programmes for the restoration of ecological continuity of water bodies and Cohesion Policy funds are used to support their implementation. The coordination between expenditure under the CAP, Cohesion Policy and LIFE targeting flood management, wetland restoration, etc should be improved so as to ensure that actions are complementary and duplication is avoided, thereby strengthening the efficiency and effectiveness of public expenditure.

Regional Policy and innovative financing
Change 2b) Cohesion Policy Programmes supporting integrated urban development and community-led actions should promote effectively initiatives for ecosystem-based urban micro-climate regulation. Such initiatives include: the cooling effect of green spaces and insulation of buildings through Green roofs. Furthermore, policy programmes should promote measures for climate change adaptation, measures to improve the resilience of man-made and natural capital in urban settings and for developing the adaptive capacities of communities, administrations and other stakeholders. Where projects can be revenue-generating (such as for energy efficiency), the use of innovative financial instruments such as Joint European Support for Sustainable Investment in City Areas (JESSICA) can be established while freeing up grant money for Green Infrastructure, ecosystem-based measures and climate adaptation. **Change 2b)** Water Management Authorities (that draft and implement the River Basin Management Plans) can develop "Multiannual programmes for the restoration of ecological continuity of water bodies" and apply for funding for these under the European Regional Development Fund (ERDF). The scope of JASPERS can be expanded to provide technical assistance for Green Infrastructure by integrating expertise on -financing and biodiversity-proofing the large infrastructure projects promoted under Cohesion Policy. The scope of JASPERS can be further extended to provide assistance for Green Infrastructure issues in EU-15 Member States where there are deficits in capacity (see technical assistance).
Marine and coastal zones Policy
Change 2b) E(M)FF could be used to support measures relying on GI to meet objectives of the MSFD, in particular achieving Good Environmental Status (GES) by 2020. The EMFF proposal includes an axis for the Integrated Maritime Policy as well as an axis for sustainable development of fishing areas. This could fund restoration activities eg restoring salt marshes to create coastal fish nurseries to replenish fish stocks and improve coastal protection in view of adapting to climate change and extreme weather events. There would be the possibility to include more emphasis on restoration programmes eg in protected areas to support the improvements in ecological quality newly designated Marine Protected Areas) through the E(M)FF (ie management of GI).
EC external development cooperation
Change 2b) Public investments: The next 'Environment and Natural Resources Thematic Programme' (ENRTP) foresees financing for ecosystem-based approaches to delivering services such as carbon storage, flood prevention/water management (quantity), wastewater management and water cleansing (quality), and provides incentives for developing countries proposing such projects. In other programmes which are more concerned with the development of grey infrastructure (eg road and electricity distribution networks), EIAs and cost-benefit analysis should include requirements to clearly acknowledge the impacts of projects on Green infrastructure and related ecosystem services in order to ensure that ways to minimise impacts are devised. Funding is made conditional on adequate mitigation and the choice of the option which minimises adverse impacts.

1.1.2 2c) Awareness raising/ tailored guidance & technical assistance/ capacity building

2c) Awareness raising and tailored/revised guidance
⇨ **Concrete policy knock-on effects in specific policy areas**

Agricultural policy
Change 2c) ***Communication and advisory measures***: EU guidance on mapping and monitoring of High Nature Value farmland should be reinforced and encouragement for experience sharing in these matters between Member States. In particular, this guidance should seek to encourage Member States to use of the Land Parcel Information System (LPIS) for monitoring landscape features more comprehensively and rigorously, and to enhance the LPIS across the EU-27 to include land use elements relevant to Green Infrastructure. In addition, Member States should be encouraged to use the training, advisory and information measures under the rural development policy to promote management related to Green Infrastructure. The Farm Advisory System would benefit from revisions aiming to provide more focused advice on Green Infrastructure-related management. Where Natura 2000 Coherence Action Plans or other plans for implementation of Article 10 of the Habitats Directive exist in Member States (see below), the agricultural authorities should be encouraged to integrate them in the relevant CAP rural development measures (GAEC cross-compliance, Natura 2000 payments, agri-environment, non-productive investments on agricultural land etc)
Forestry
Change 2c) Communication and advisory measures: Guidance and voluntary rules on reforestation and afforestation taking into account the maximisation of Green Infrastructure elements should be developed, providing a framework to support forest owners/ authorities to take specific contexts (ie regional needs and vulnerabilities) into account. This could include, for example, the risk of forest fires in Mediterranean forests, avalanches in Alpine forests, the effects of climate change and droughts in central Europe, amongst other factors. As a rule, genetic diversity and most adapted species should be favoured, deadwood provision encouraged etc Member States should be encouraged to develop a reference line for forest management comparable to GAEC cross-compliance on agricultural land to be able to more efficiently use the forest-environment measure under CAP Pillar 2. Environmental, agricultural and forestry authorities in Member States should be encouraged to co-operate in developing rigorous plans for afforestation measures supported by state aids or the CAP, including the identification of appropriate sites, afforestation species, management measures etc Where Natura 2000 Coherence Action Plans or other plans for the implementation of Article 10 of the Habitats Directive exists in Member States (see below), Member States should be encouraged to integrate the basic principles of these into National Forestry Plans. Finally, the EU could launch a competition and dispenses "Forest Function Awards" to private forest owners applying the highest Sustainable Forest Management standards for the provision of regionally important ecosystem services
Biodiversity and nature conservation
Change 2c) Communication and advisory measures: Member States to consider adequately coherence issues in Appropriate Assessments. Revised **EU guidance regarding Appropriate Assessments** (Article 6 Assessments) suggests that Member States should produce Natura 2000 site management plans that identify coherence needs for vulnerable species and ecosystem processes. Guidance on the Habitats Directive and Birds Directive to require adequate consideration of coherence issues in the assessment of impacts, compensation and liabilities under these Directives. European Commission to produce technical guidance and tools to assist Member States in preparing Natura 2000 Coherence Action Plans, implementation of Article 10 of the Habitats Directive and other connectivity issues.
Water Policy
Change 2c) Communication and advisory measures: Updated EU guidance on drafting national River Basin Management Plans recommends that a concept for water-related Green Infrastructure measures (including natural water retention measures) is present and budget and funding estimations are provided. Guidance and toolkits are produced at European level to support the implementation of water-related Green

Infrastructure at Member State, regional and local level. Best-practice with regard to using economic instruments (water pricing and Payments for Ecosystem Services) for ecosystem services is shared in the guidance. As a first step, guidance should recommend that all water management plans under the Water Framework Directive identify the provision of water, as an ecosystem service, when identifying all the sources of water (ie groundwater, surface water etc) and their users. Guidance: Best practice in implementing Green Infrastructure water-related elements in some Member States is established. Guidance is developed including some of the best EU ecosystem-based approaches and projects on measures fornatural water retention. Guidance is provided to Member States, regions and rural areas regarding how Green Infrastructure water-related projects can be prioritised in expenditure programmes for EU funds and financed by EAFRD, ERDF and/or LIFE+.
Regional Policy and innovative financing
Change 2c) Communications and advisory measures: EC to inform / disseminate best practice examples of projects which protect, maintain or restore elements of Green Infrastructure to demonstrate benefits. Guidelines developed for Green Infrastructure at national/regional levels targeting managing authorities, beneficiaries and project promoters. Guidance to regions to illustrate which type of projects are eligible for funding. Encourage increased demand for funding for Green Infrastructure projects by disseminating evidence on the need and the benefit of such projects through the managing authorities of Operational Programmes. Authorities in Member States encouraged particularly to provide more targeted support and capacity building for Green Infrastructure project design and implementation at lower tiers of governance. The guidance should also provide an indication of the investments that tend to result in a high risk to green infrastructure and propose instrument/tools for minimising their adverse impacts Greater guidance and support to be given to Member States and regional levels to ensure that environmental considerations are taken into account in the design of programmes. Guidance to be given on identifying best practice, highlighting Environmental Impact Assessments and Strategic Environmental Assessments which have takeninto account Green Infrastructure. Advise all Operational Programme managing authorities to install an Environmental Sustainability Manager to enable more effective promotion of Green Infrastructure and co-ordination and integration across policies. Exchange information on best practice in the implementation of Green Infrastructure through the creation of national environmental networks and creation of a Green Infrastructure working group within the European Network of Environmental Authorities and Managing Authorities on Cohesion Policy (ENEA-MA). Awareness raising and guidance to monitoring committees (which usually include non-environmental authorities and stakeholders) to integrate Green Infrastructure considerations into their activities (eg project selection development, revisions of OPs, annual reporting, etc)
Transport and Energy
Change 2c) Communications and advisory measures: The 2011 white paper on transport impact assessment would provide a definition of “Green Infrastructure” which is compatible with the one promoted by DG ENV. Along with the TEN guidelines, the white paper would encourage MS to incorporate provision of (adequate) green infrastructure into public procurement contracts for transport and energy infrastructure, this includes measures such as the construction of green bridges but could also be, for example, provision of low vegetation for carbon storage along motorways. A new guidance document on adequate consideration of GI should be prepared for all financing under the future Connecting Europe Facility. It should address all issues and provide both best practice examples and GI relevant guidance on consideration of GI in feasibility studies (valuation of BD and ESS), and Road and Energy EIA and SEA. Advice should include: - explicit mention of the need to minimise impacts on GI and seize opportunities to strategically develop green infrastructure alongside grey infrastructure - a recommendation that under the European Social Fund, funding is made available for training for managing authorities, spatial planners and civil engineers to incorporate GI in transport and energy infrastructure development programmes and projects

- a recommendation that projects applying for funding should be part of Integrated Transport Planning processes that take into account the need to preserve GI at all territorial levels (European, national, regional and local)
Impact assessment and liability
Change 2c) Communications and advisory measures: Increased guidance to ensure best practice sharing in integrating GI elements; EIA and SEA guidelines should: - provide unified criteria for better GI consideration. Checklists should be revised to integrate tools relevant for an appropriate consideration of impacts on GI in impact assessments; - recommend indicators for assessing impacts of developments on GI elements and ESS (for full integration of BD and ESS impacts, including social benefits) and provides recommendations for impact avoidance and mitigation. - illustrate how coherence, connectivity and resilience to climate change (expanding the spatial and temporal scope) can best be taken into account. - promote best practice in consultation procedures/ participatory processes in EIA and SEA to better take into account GI and its benefits (eg recreation, health etc). - emphasize the need for creation and preservation of GI through measures to prevent, reduce and where possible offset any significant adverse effects on GI but also stress the scope within EIA/SEA to identify positive opportunities for enhancing GI and seizing opportunities to support biodiversity (connectivity) and provide ecosystem services (eg green roofs, carbon storage, etc). - encourage/require the use of SEA (which should consider GI) when developing spatial policies and (development) plans. - include clarification and guidance on application of SEA to Cohesion Policy funds by updating the SEA handbook for Cohesion Policy.[1] - for EIA, provide unified criteria for better GI incorporation. Produce GI guidelines on joint procedures for requirement fulfilment. improve the coordination between EIA, SEA and Appropriate Assessments of the Habitats Directive in terms of GI.
Fisheries and coastal zones policy
Change 2c) Guidance: (Revised) ICZM recommendations suggest that national Strategies should foresee/encourage measures for the identification and protection of key GI in protected areas, through the use of tools such as land purchase and declarations of public domain, as part of an integrated management of the coastal zones which is to be protected. The protection of still unspoilt coastal areas and open access to coastal areas is promoted. ICZM refer to the need to additionally identify restoration areas with a view to adapting to climate change and investing in natural costal defence. EFF money is available to support these activities, with the potential for particularly favourable co-financing rates where ecosystem based solutions have been selected.

2c) Technical Assistance and Capacity Building
⇨ **Concrete policy knock-on effects in specific policy areas**
Forest Policy

[1] GRDP. 2006. SEA Handbook. http://ec.europa.eu/regional_policy/sources/docoffic/working/doc/sea_handbook_final_foreword.pdf

Change 2c) Technical assistance/ Facilitation/ Governance: Establish an inter-sectoral or technical working group under the Standing Forestry Committee with a mandate to share practices, coordinate approaches and spread information on:

(1) setting the objectives and developing the indicators for monitoring and mapping of Green Infrastructure and ecosystem services on forested land;
(2) implementation of such monitoring systems and mapping approaches;
(3) national approaches to the implementation of the MCPFE SFM commitments, particularly those which relate to GI-management and protective functions of forest.

There is a need to organise temporary working groups on these issues with the aim to maximise the use of forest management plans. The working group would allow experience to be shared on the sharpening of the Sustainable Forest Management Requirements that relate to Green Infrastructure-management and the protective functions of forests, and on their integration in forest management plans. In particular, the working group should aim to define the minimum Sustainable Forest Management standards that address ecological coherence and connectivity, and explore the possibilities for an EU initiative to pursue these standards under a "Legally Binding agreement on Forests in Europe".

*Should aim at producing a common report on existing national strategies or initiatives highlighting best practices (in SFM, forest ecosystem services and protective functions, protection and forest Green Infrastructure) in order to promote a mutual learning process; maximise CAP-related funding efficiency through mapping or recording of funding relevant to Green Infrastructure on farmland and synergetic effects with adjacent forest land (see also Biodiversity Strategy 2011 "mechanisms to facilitate collaboration among farmers and foresters to achieve continuity of landscape features")

Water Policy

Change 2c) Technical assistance: Authorities responsible for the implementation of River Basin Management Plans may benefit from EU funds for organising training for Green Infrastructure planning, mapping (for example of inventories of obsolete infrastructure) monitoring and the design of measures relying on Green Infrastructure. Technical assistance under the Joint Assistance to Support Projects in European Regions (JASPERS) programme provides assessment of the feasibility of Green Infrastructure elements as part of water treatment projects.

Climate Change Policy

Change 2c) Investments & technical assistance/advisory measures: Common Strategic Framework funds (eg Cohesion Policy [including JASPERS], EAFRD and EMFF) provide technical assistance to regional administrations that wish to promote Green Infrastructure in climate change adaptation and mitigation activities. Funding is made available for projects which seek to reduce the vulnerability of a region and enhance the resilience of the EU to the impacts of climate change. The climate component of LIFE+ is used for innovative and demonstration projects for Green Infrastructure measures for climate mitigation and adaptation. The governance strand of the LIFE+ climate component can provide financing for technical assistance, policy advice and capacity building for regional authorities preparing their climate change adaptation strategies, in which Green Infrastructure elements are incorporated.

Regional Policy and innovative financing

Change 2c) Technical assistance: Technical assistance for Green Infrastructure provided through JASPERS. The financial framework for the urban environment is used to a greater extent to support projects which deliver environmental objectives through Green Infrastructure. Through guidance and training, the regional level is encouraged to propose projects which demonstrate positive outcomes from Green Infrastructure and therefore allow for the identification and quantification of benefits, at this level or more locally. In particular, Cohesion Policy provides technical assistance to regional administrations that wish to promote

Green Infrastructure through ecosystem-based solutions, including in climate change adaptation and mitigation activities, ecological wastewater treatment plants and Natural Water retention measures. Train Operational Programmes and regional management bodies on the concept of Green Infrastructure and build awareness of benefits so that a larger number of such projects are developed and ownership is increased.

1.1.3 2 d) Research

2d) Research
⇨ **Concrete policy knock-on effects in specific policy areas**
Horizon 2020
Green infrastructure is made one of the priority areas for research activities in terms of the necessary transformations towards a resource efficient, low carbon and resilient bio-economy.
Biodiversity and nature conservation
Change 2d) Research: The research Agenda would reflect some of the recommendations from EPBRS's assessment of the research needs on "Biodiversity and Planning". **The EU Biodiversity strategy 2020 – research needs** • improve baseline information and assessments of species and habitat distribution, status and trends, and human dependencies on the services they provide (>> target 2, action 5) • examine how the concept of green infrastructure and ecosystem restoration can provide sustainable nature conservation (>> target 2, action 6 a, b) • examine the concept of biodiversity offsets, and how, and under what conditions, they might contribute to "no net loss" of biodiversity (>> target 2, action 7) **Habitat and species conservation under climate change** • develop methods to restore, maintain or improve the ecological functioning of protected areas, landscapes and seascapes for biodiversity conservation • develop planning and management strategies that enhance the connectivity between protected areas to improve species exchange. • better understand the perceptions and knowledge of site managers and owners in order to develop strategies that optimise adaptive management • develop a database about the relationship between spatial characteristics of landscapes and ecological networks and ecological processes in populations and ecosystems, to be applicable in developing planning targets and designing spatial solutions **Planning for sustaining and restoring ecosystem services** • better understand the disruption of ecosystem processes which result in depleted ecosystem services, at various scales in time and space, caused by natural and anthropogenic drivers, • develop and apply standardized indicators, methods and criteria for the measurements, mapping and assessment of ecosystem services for various temporal and spatial scales (>> target 2) • further develop cost-benefit assessments of ecosystem services (and other economic instruments) to identify optimal uses of resources • develop stakeholder-oriented science-based tools for collaborative planning and design of ecosystem services in multifunctional and urban landscapes **Mainstreaming biodiversity planning into sectoral policies**

• better quantify the impacts on biodiversity of existing and future policies (e.g. common • agricultural and fisheries policies), such as those addressing land and sea use, by means of interdisciplinary and cross-sectoral research • identify planning tools applicable across sectors in order to avoid or reduce these impacts develop better ways to involve regional stakeholders in awareness, use and maintenance of planning issues related to biodiversity
Change 2d) Information gathering and mapping: Areas where research effort would be scaled up would include: improved research on fragmentation/ habitat coherence impacts on species and habitats of Community interest and Annex I birds; monitoring of the ecological benefits of GI measures; Improved monitoring of species and habitats of Community interest and Annex I birds, so that the status of all are reliably known.
Climate Change Policy
Change 2d) Information gathering and mapping: Improve information gather and mapping in relation to green infrastructure for climate change adaptation and mitigation would involve the promotion and coordination of the research activities at the EU level on the potential of GI to reduce the vulnerability and enhance the resilience of the EU to climate change. An EU-wide research project could be initiative with the aim to identify areas particularly vulnerable to climate change and at risk of losing ESS if no restoration activities for degraded ecosystems are undertaken. EU should take this mapping into account for allocation of funding to projects aimed at increasing resilience through GI. The EU would also support the development of relevant guidance documents and the provision of advice and capacity building related to ecosystem based CC adaptation at the EU level (see CP and LIFE+ integrated projects and innovative financing).
Spatial planning
Change 2d) Research: Promote further demand for GI-related technical assistance through the ESPON 2013. In particular, further exploit the opportunities offered by priority lines 1, 2 and 3 of ESPON 2013 to finance projects incorporating the GI concept in order to create information, indicators, territorial data and tools as a contribution to the territorial cohesion approach. In particular, activities to support GI could be incorporated under the priority lines which support research on the environment (eg natural resources, risks, biodiversity, Natura Network sites and other themes), with the purpose of aiding in the elaboration of territorial planning tools that incorporate territorial cohesion and sustainability. Should there be a follow up programme for ESPON, it should be ensured that it can financially support the mapping of GI elements in regions which are CP beneficiaries (as mapping might become obligatory under option 3).
Environment and Health
Change 2d) Research: A research Agenda into the links between GI and respiratory diseases should be further promoted in the next Environment and Health Action Plan (see research for more detail). Other issues to be investigated include: the capacity for green roofs and urban green spaces to mitigate the urban heat island effect and reduce the magnitude and duration of heat waves and the possible contribution of urban green spaces to further improving air quality. In addition green infrastructure may contribute to reducing obesity by offering space for outdoor recreation and exercise. The role of riparian vegetation in reducing the risks of high concentrations of nitrates in drinking water or pollution of bathing water could also be a topic. Where relevant and definitive, conclusions should be reflected in air and water policies.
Soil Policy
Change 2d) Research: Horizons 2020 would also support research activities relating to the interlinkages between soil functions and green infrastructure and the identification of the potential of green infrastructure to be used to address some of the threats to soil identified in the 2006 Strategy Thematic Strategy in view of promoting best practice in this regard and financing cost-effective interventions through the EU budget.

1.1.4 2e) EU GI integration toolkit for spatial and regional planners

2e) EU GI integration toolkit for spatial and regional planners
Change 2e) EU GI integration toolkit for spatial and regional planners: Under this measure, the EU would develop a toolkit to support spatial and regional planners in better taking into account green infrastructure. Building on respective mandates from the 1999 European Spatial Development Perspective (ESDP) and the 2011 Territorial Agenda, the EC GI toolkit would outline the ways in which a more integrated approach to spatial and urban planning would consider green infrastructure elements. The toolkit would address key issues of relevance to green infrastructure implementation such as the restoration of ecosystems, maintenance and enhancement of protected areas (Natura 2000), the integration of ecological corridors and the need to reconcile ecological functions with economic exploitation. The toolkit, supported by the approach to GI adopted in the Strategy, would make clear that a pre-requisite of meaningful integration of GI into planning strategies is the setting of clear and reachable targets for future planning within the relevant documents. For multi-level planning structures (such as in Germany), it would recommend that targets and objectives are consistent across levels and that competing demands on land use are considered upfront in the strategies. As maps fulfil a core function in improving the incorporation of green infrastructure in spatial planning, consideration should be given to the establishment of a taskforce to develop guidance on technical and institutional aspects related to mapping Green Infrastructure elements. This taskforce could be coordinated by the EEA and would include a representative range of experts and key stakeholders. In line with the subsidiarity principle, EU MS would carry out GI mapping themselves. However, the taskforce could adopt the role of compiling MS results to provide an EU wide assessment of current implementation and status of GI. It would also encourage MS to apply GIS tools in spatial planning and to make use of the information from Spatial Observatory Networks to determine trends of territorial development and their relation to further GI integration. Special advice relating to the benefits of urban GI would also be provided with the intention of making planners aware of the potential cost-savings that can be obtained by using Green Infrastructure. In order to visualise the benefits gained from better consideration of GI in the planning process, the toolkit would also introduce valuation methods. Key EU level Strategic documents relating to spatial planning and integrated territorial development could be further aligned with the green infrastructure approach. Key strategic instruments which already provide relevant hooks could be referred to. The ESDP, for example, proposes the preservation and restoration of large wetlands endangered by excessive water extraction or the diversion of inlets, and the concerted management of the seas, in particular, preservation and restoration of threatened marine ecosystems. In addition, under the objective 'territorial polycentric development and new rural-urban relationship' the ESDP points out the importance of green spaces in cities. The integration of GI in spatial planning would require a reform of spatial planning laws in many countries. To encourage the dissemination across MS, the toolkit would build on and refer to practical examples drawn from existing initiatives (eg Stockholm's blue-green infrastructure-RUFS 2010) while at the same time providing information about possible sources for support (ie ESPON, LIFE+). Cities, for example, would be particularly encouraged to draft climate change adaptation plans incorporating green infrastructure and EU would ensure that its funding instruments provide incentives to adopting green infrastructure based approaches in spatial planning.

1.1.5 2f) Creation of a Gateway for European GI information (on the model of WISE/BISE)

2f) Creation of a Gateway for European GI information (on the model of WISE/BISE)
Change 2f) A Gateway for European Green Infrastructure information is created: A gateway for European Green Infrastructure information would be set up following the model of WISE (Water Information System for Europe) and BISE (Biodiversity Information System for Europe). It could also be an expansion of BISE. This would become a key element of the institutional structure to promote the development of Green Infrastructure across the EU and would facilitate the exchange of experiences and information. A platform based on the model of WISE would serve in particular as an 'Information Gateway' collecting, processing and disseminating information on Green Infrastructure. As for WISE, this information platform could be created by the European Commission in collaboration with the European Environment Agency (EEA). The Gateway would consist of technical information and data on Green Infrastructure, but would also serve as the communication platform on policies for Green Infrastructure implementation and would provide clarifications and illustrations of the implications of these policies across different sectors (including, for example, sector specific guidance documents). Moreover, information and results from a wide array of research projects addressing the different Green Infrastructure sub-topics will be made available in a comprehensive manner. Linking research results and information to responsible research institutes and individuals would allow for a better exchange of information among researchers, experts and practitioners, as would allow these groups to know where and from whom information and experiences can be obtained. The platform , would bring together information gained from the implementation of the measures outlined under option 2, which suppose a high level of coordination. As data, maps and technical information would represent a high share of the information to be processed and published, it could make sense to assign the responsibility for the platform to the EEA and/ or the JRC. Finally, as for the Natura 2000 portal, the most relevant maps and data could be retrieved from the portal (eg harmonised maps of Green Infrastructure produced for the EU level).

1.1.6 2 g) Review of a range of selected/specific Strategic instruments at EU level

2g) Review of a range of selected/specific Strategic instruments at EU level
⇨ **Concrete policy knock-on effects in specific policy areas**
Forestry Policies
Change 2g) EU adopts **"Strategy on forest protection and information"** (based on the 2010 Green Paper) in which the establishment and preservation of forests and features relevant to Green Infrastructure is a priority in the context of climate change adaptation and disaster prevention/risk management. An important component of the strategy is a review of the EU Forest Action Plan (FAP) to enhance coordination of national approaches especially for monitoring and mapping Green Infrastructure elements and ecosystem services within and around forests. The availability of funding to support the strategy is explored, and options for earmarking funds to achieve set targets within a set timeframe are investigated. The strategy will include EU guidance for the sharpening of the SFM standards relating to Green Infrastructure-management and protective functions of forest in the forest management plans. It will include targets for: adaptive afforestation; reduction of damage at felling; genetic diversity of forests;, increased adaptive capacity of forests; key elements of functional connectivity (eg maintenance of understorey; vegetation soil cover; dead wood; genetic improvement of the adaptive potential (eg through inter-species diversity) with a particular focus on forests in climate vulnerable regions (this needs more research in many cases). Another strategic objective could involve a commitment to define a certain percentage of wilderness area in forests to be

designated as core green infrastructure. The percentage could be set at national level and be variable depending on national circumstances and in particular current endowment in wilderness area (in addition, the percentage could also be set at the holding level and could differentiate between large and small holdings). The Strategy would also coordinate the identification, mapping, measurement and monitoring of Green Infrastructure elements relevant to forests as a component of wider forest monitoring. Reporting on the implementation of the Strategy (including improved reporting to the MCPFE on indicators of SFM), integration of the strategy objectives in other EU forest relevant policy documents (eg RES-D, Directive on marketing of forest reproductive material, EU policies on forestry and forestry based industries)

Regional Policy and innovative financing

Change 2g) Strategies and Action Plans: EU encouragement of Green Infrastructure as a new priority area. For example, the European Commission publishes a Communication entitled 'Natural Assets for Cohesion Policy and Green Growth'. As a result, the Green Infrastructure concept is integrated further into Macro-Regional Strategies which seek to provide a framework for integrated expenditure planning at the level of functional geographies (eg Danube and Baltic), primarily implemented by mobilising and aligning existing funding to its objectives. The Macro-Regional Strategies clearly recognise each region's specific natural assets and likely need to invest in natural capital, in particular in the context of adapting to climate change. For Macro-Regional Strategies, the setting of targets specific to the region's Green Infrastructure is explicitly encouraged. The Action Plans accompanying the Macro-Regional Strategies support the relevant priority Green Infrastructure measures for the region. For example, in the case of the Danube, priorities will be to restore and maintain the quality of water, to manage environmental risks, to preserve biodiversity, landscapes and the quality of air and soils. For the Baltic Sea, particular priorities will be to use Green Infrastructure for the reduction of the flow of nutrients into the sea and the development of natural fish nurseries (including through European Marine and Fisheries Fund (EMFF) funding).
The Commission Communication makes clear that Cohesion Policy will support the implementation of the Adaptation Strategy which is due 2013. It should especially do so with regard to disaster risk reduction and the cost-effective reduction of vulnerability and impacts through "softer" measures (i.e. ecosystem based solutions) should be a key element to pursue this objective.

Spatial planning

Change 2g) Strategies and Action Plans: A revision of the Thematic Strategy on the Urban Environment is carried out. The revised version makes a clear reference to the role of Green Infrastructure in improving the urban environment, and contributing to improvements in quality of life and the provision of a range of key ecosystem services. The importance of services and health benefits linked to recreation, improvement in air quality, micro-climate regulation, water runoff management, sustainable transport (ie green lanes for pedestrians and cyclists), energy savings and environmental risk management is acknowledged, and ecosystem based solutions for delivering these services are encouraged. The revised Thematic Strategy on the Urban Environment makes reference to the funding instruments which may finance projects and provide technical assistance. In addition, the Financial Framework for the Urban Environment (Decision No 1411/2001/EC) is revised to clearly commit to this new orientation.

Environment and Health

Change 2g) Strategies and Action Plans: The next Environment and Health Action Plan should also aim at stepping up cooperation between stakeholders in the environment, health and research fields around questions relating to the linkages between green infrastructure and human health. A future action plan should acknowledge the role of green infrastructure in reducing air pollution (ie reducing exposure to pollution and noise and lessening of urban micro-climate regulation/ heat island effect which reduces air quality, eg by creation of ozone) and supporting healthy lifestyle choices. It should also promote the inclusion of 'proximity to urban green space' or 'urban green space per capita' among health related indicators as they have proven to be correlated with health.

A research Agenda into the links between GI and respiratory diseases should be further promoted in the

next Environment and Health Action Plan (see research section below for more detail).

1.2 Option 3

1.2.1 a) Revised Regulation on Environmental Economic Accounts

3a) Revised Regulation on Environmental Economic Accounts
The Regulations on Environmental Economic Accounts ((EU) No 691/2011) undergoes a revision. European Commission proposes a range of new mandatory reporting requirements to support the implementation on the GI Strategy. Based on a clear definition all GI elements are quantified in all MS and regions. As foreseen in the resource efficiency Roadmap, the state of ecosystems and their services is to be mapped by 2014 in view of assessing their economic value and promoting inclusion of these values into EU and national accounting and reporting systems by 2020. Ultimately the objective is to establish a full requirement for MS and regions to map green infrastructure and develop natural capital accounts – noting assets, quality/quantity, functions, and flows of services. In view of implementing the "no-net loss of GI" policy elaborated in the Biodiversity Strategy MS are also responsible for ensuring that all GI elements on their territory are mapped and regularly reported on under the Regulation of Economic Environmental accounts. While leaving some flexibility to MS, the provisions at EU level clarify what should be mapped, how it should be accounted and reported. GI creation/restoration zones are also identified and are meant to be used in particular at EU level to channel funding to those areas in priority. These are to be identified based on a range of clearly outlined ecological criteria and in view of increasing the connectivity, resilience and coherence of the country's/region's overall GI. The general idea is that key ecological continuities and GI elements as well as gaps/bottlenecks in the network are addressed in view of strengthening the resilience of the network and maximising the provision of ecosystem services. MSs are given 5 years before transmitting their first GI accounts, meeting a range of ecological criteria, to the EC, after this, the reports are to be sent every four years and updated every 4 years to monitor trends in GI and on progress towards achieving the restoration targets. MS are to report every four years on measures taken to ensure "Good environment status of overall GI". Indicators could include fragmentation, surface covered with certain GI elements, loss of connectivity features, etc MS also report on trends in operational objectives set out in the Strategy. Harmonised GI monitoring indicators are presented in the Annex to the regulation.

1.2.2 b) Development of EU-wide 100x100 meter maps of green infrastructure (eg by EEA and/or JRC)

3b) Development of EU-wide 100x100 meter maps of green infrastructure (eg by EEA and/or JRC)
Based on the information provided by MS under the regulation on Economic Environmental Accounts and GIS data, EU-wide 100x100 meter maps of Green Infrastructure are developed (possibly by EEA or JRC) in view of making these available to all regions and MS authorities so they can be used when submitting applications for EU funding, as required by the revised regulations on structural and cohesion funds. The maps do not only identify existing GI but also GI creation/restoration zones – areas where GI creation and restoration is seen as key to ensuring connectivity and overall coherence of the country's GI. EU funding to support GI implementation is particularly channelled into these areas by increasing financial support where proposed agri-environment measures or GI creation/restoration projects are to take place in those specific areas.

Applicants for EU funds are also requested to use the EEA GI maps, to outline if and what sort of impacts their proposed project or programme is likely to have on the mapped GI elements and overall ecological coherence. They should demonstrate that the option chosen is the one which minimises impacts on GI and that adequate mitigation and remediation measures will be taken to ensure ecological coherence and connectivity.

1.2.3 c) GI made a priority in the Common Strategic Framework and Regulations governing key EU funding instruments (Cohesion Policy, CAP, LIFE)

3c) GI made a priority in the Common Strategic Framework and Regulations governing key EU funding instruments (Cohesion Policy, CAP, LIFE)

⇨ Concrete policy knock-on effects in specific policy areas

The Common Strategic Frameworks (for the five funds under shared management) translates the GI related objective into an investment priority including key actions and focus areas for GI. The mechanism for funds coordination for an integrated approach to investing in GI will have to be outlined.

Regional Policy and innovative financing

Change 3g) The new Regulation on laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and repealing Regulation (EC) No1083/2006:

- Includes "Enhancing Europe's green infrastructure and ecosystem resilience" in the list of **thematic objectives** and this is reflected in **priority interventions** specified in the Fund-specific Regulations and the categories of expenditure (Annex) which includes a range of investments in Green Infrastructure, reflecting its multipurpose character. Such investments include: improving quality of life; health (air quality); resilience of economies andurban areas to climate change; flood risk prevention and management; energy efficiency; attractiveness of places.
- Foresees differentiated **co-financing rates** (higher EU co-financing rate for Green Infrastructure projects when these are to be implemented in Green Infrastructure creation/restoration zones identified in European Environment Agency maps) and support to Green Infrastructure projects as part of the LIFE+ integrated instruments.
- Encourages Member States to include Green Infrastructure as a priority in **Partnership Contracts** and Operational Programmes and give ecosystem-based solutions (Green Infrastructure projects) priority over alternatives during the **project selection process.**
- Regions applying for funding under the Cohesion Policy are requested to establish an **environmental baseline** which includes stocks of Green Infrastructure elements (which are integrated into the 'Strengths, Weaknesses, Opportunities, Threats' analysis, ex-ante evaluation and Strategic Environmental Assessment). Regions are requested to assess how a programming period is expected to affect Green Infrastructure stocks and monitor and report on stocks on a regular basis within the proposed **performance framework**, which includes targets, milestones and indicators for Green Infrastructure.
- Establishes a **performance reserve** linked to the enhancement of Green Infrastructure to reward projects that do not have GI at their core but nonetheless deliver benefits for Green Infrastructure. **Suspension of funding** is also envisioned in the case of expenditure that has severe negative impacts on the integrity of ecosystems.
- As part of the **thematic and horizontal ex-ante conditionality** proposed in the Regulation, Cohesion Policy funding of grey infrastructure projects is subject, inter alia, to following ex-ante conditionality: (a) full mapping and identification of the region's Green Infrastructure according to the criteria foreseen in the Green Infrastructure mapping provisions (b) demonstration of the capacity to apply governance instruments such as Strategic Environmental Assessment and Environmental Impact Assessment for programmes and projects.

Innovative financing: JASPERS could provide technical assistance on the development of Green Infrastructure projects and/or the inclusion of Green Infrastructure and biodiversity proofing elements in the feasibility studies for large scale infrastructure. JESSICA could be used to support projects delivering energy efficiency improvements through the use of trees and plants to cool urban temperatures, reducing energy needs for cooling (as foreseen by the European Commission's 2011 Energy Efficiency Plan). This would thereby free up grant money under the ERDF for non-revenue generating projects focused on ecosystem- based climate adaptation projects, for instance those focused on the mitigation of flood risk and on water, air and ecosystem quality.
Agricultural Policy
Within the CAP Pillar 2 (Agricultural Fund for Rural Development), the mandatory character of the agri-environmental measure and minimum spend requirements relating to them are maintained. The focus on habitat restoration in agri-environment measures is strengthened; bonus/top-up payments should be granted to recipients of rural development funding (ie. under the agri-environment scheme) who commit to landscape-scale management involving multiple holdings. The establishment of connectivity features which provide added value ecologically are required as a compulsory part of investments in the measures supporting infrastructure built on agricultural land and holdings. Within the CAP Pillar 1, a range of changes are made. The greening measures introduced under Pillar 1 are based on multiannual contracts. The provisions for Ecological Focus Areas and the protection of permanent pasture as 'greening measures' under Pillar 1 make these measures mandatory and thus contribute to Green Infrastructure-related management. New mandatory provisions for GAEC standards relating to Green Infrastructure are introduced (eg minimum connectivity elements, wetland protection, permanent pasture, HNV farmland, etc) as they would positively impact on land use across the EU. Support to organic farming should be strengthening under greening measures for Pillar 1 and a bonus should be provided under Pillar 1 for Natura 2000 and HNV farms. With regard to forestry, specific measures for contractual agreements for forest ecosystem services and protection and restoration of connectivity within and between forests are introduced; a minimum spend for forest-related measures is ensured to promote the uptake of forest management beneficial to Green Infrastructure.

1.2.4 3 d) Biodiversity and climate proofing is streamlined into key EU funding instruments (eg Cohesion Policy, TEN guidelines and Connecting Europe Facility, CAP)

3d) Biodiversity and climate proofing is streamlined into key EU funding instruments (eg Cohesion Policy, TEN guidelines and Connecting Europe Facility, CAP, etc)
⇨ **Concrete policy knock-on effects in specific policy areas**
Transport and Energy
Change 3d): The provisions governing the functioning of the **Connecting Europe Facility** stipulate the following: a) All projects should be biodiversity and climate proofed. As for Cohesion Policy, this is to be achieved by integrating GI relevant evaluation criteria in a transparent scoring/ pointing system which will disqualify/ downgrade projects with likely negative impacts on GI. At the same time, projects which make particular efforts to minimise impacts on GI (such as fragmentation, land take), for example by combining transport and energy distribution networks, get bonus points. b) All applications for funds include harmonised GI maps (meeting minimum requirements/ standards

established at EU level - see change 3b) are prepared based on the information transmitted. The proposed physical infrastructure developments are presented on these maps and the impact assessment should convincingly demonstrate that the option chosen is the one that minimises impacts on the existing Green Infrastructure. This is reflected in the scoring system.

c) The EU share of co-financing under the Connecting Europe Facility is increased when developers who apply for funding under this Facility add to their project proposal a plan committing them to investing 3% of the co-financing funds in increasing connectivity between Natura 2000 sites located in close proximity. In this case, together with the application for funding, the developer submits a report analysing which is the most cost-effective option to deliver ecosystem and biodiversity benefits and clarifies which option has been retained and why (ie beyond wildlife crossing, consideration should systematically be given to other options such as GI creation and restoration near the N2K sites).

a) MS to allocate proportion of road user fees for maintenance and enhancement of GI associated with roads, such as wildlife corridors – instead of having to invest 15% of the funds generated by the eurovignette tools in priority projects of TEN-T, MS may also decide to spend it on road infrastructure mitigation projects.

1.2.5 3 e) Revised EIA/SEA Directives

3e) Revision of the EIA/SEA Directives
⇨ **Concrete policy knock-on effects in specific policy areas**
Impact Assessment, damage prevention and remediation
Change 3e): **Revision of the EIA/SEA Directives**: A reform of the EIA and SEA Directives would ensure a fuller consideration of impacts of development projects on GI and its coherence (eg expanding guidelines to cover any projects and programmes which have impacts on any GI element and adapting the depth of EIA and SEA to the scale of development to ensure effort is proportionate to likely impact). In effect, this would mean that the criteria for cases in which an EIA/SEA has to be carried out could be expanded in more detail and further harmonised (eg requirement for a wider range of developments, ie smaller projects; requirement for using SEA when developing spatial policies and plans; detailed requirement to consider GI as part of the environmental assessment; systematic requirement for EIA/SEA for any EU funded project or programme which may affect any type of GI element); clarification/revision of the list of impacts to be considered (eg could be expanded to include impacts on all GI elements and/or to take into account impact on overall coherence and ESS, in particular in view of a better consideration of the requirements of Art. 6(3) of EU's Habitats Directive). The revision of EIA/SEA Directives would make the guidance (cf. option 2) a more integral part of EIA/SEA processes. For example, the adequate consideration of vulnerability to climate change when developing spatial plans would be recommended. The revised EIA/SEA Directives would in particular require that GI maps be systematically used when presenting alternative options under consideration and that the ecosystem services associated with the potentially impacted GI elements be identified. Also, measures to avoid, reduce, mitigate and compensate inevitable impacts on landscape larger range of landscape connectivity features should be systematically foreseen. These could in particular contribute to mitigating the loss/ deterioration of key “ecological continuities”/connectivity elements, including for smaller scale developments, as such efforts do not have to be overly expensive to achieve positive results. Preferred options should tend towards no net loss of key GI elements and be those which fragment and undermine the overall coherence of GI least.

1.2.6 3f) Sector specific change (1): Biodiversity and Nature Conservation

3f) Range of sector specific changes to the current legal framework
Biodiversity and Nature Conservation
Should the Habitats Directive undergo a revision, this could be seized upon as an opportunity to introduce a selected number of changes to enhance its effectiveness in preserving protected areas, the backbone of Europe's Green Infrastructure. This would be achieved in particular by clarifying a selected number of articles and emphasising the need for proactive steps towards ensuring the coherence of the Network, to improve monitoring measures and to adopt long-term funding strategies. More specifically, the Habitats Directive could undergo the following revisions: • Article 3 of the Habitats Directive to require all Member States to assess coherence and develop Action Plans to tackle deficiencies; • require Member States to produce site management plans for all Natura 2000 sites identifying coherence needs for vulnerable species and ecosystem processes; • ensure the ecological impacts of Article 6.4 compensation measures are adequately monitored and to ensure Member States consider adequately coherence issues in Appropriate Assessments; • requirement for Member States to produce long-term funding strategies that are adequate to meet the objectives of the Directives.

1.2.7 3f) Sector specific change (2): Water Policy

3f) Range of sector specific changes to the current legal framework
Water Policy
Change 3f)(2): The Future EU Water Blueprint could call for the opportunity costs of natural water retention measures to be considered systematically and where relevant translated into land acquisition, compensation or service payments. The Water Blueprint calls for introducing fair water pricing policies to ensure that major water users contribute adequately to the financial and environmental resource costs of water services. This also identifies EU funding instruments which can support investigation and implementation of ecosystem-based solutions such as natural water retention measures. For example maps and models taking into account aspects of Green Infrastructure are developed, such as river banks and wetlands, but also storm water in addition to water quality and hydromorphology (ie maps in River Basin Management Plans and mapping water quality for the Bathing Water Directive). Appropriate funding for ecological flood risk management under the Flood Risk Management Directive is ensured. River Basin Management and Integrated Constructed Wetlands are supported, following best practice examples. As a result the revised Water Framework Directive calls for the authorities responsible for the development and implementation of River Basin Management Plans to ensure that fair water pricing is introduced. In addition, the Directive ensures that some of this money is invested in securing the availability of water and improving its quality through the appropriate creation and management of Green Infrastructure (ie through the acquisition of land, compensation, or establishment of Payments for Ecosystem Services schemes at the river basin scale).

1.2.8 3f) Sector specific change (3): Marine and coastal zones policy

3f) Range of sector specific changes to the current legal framework
Marine and Coastal Zones Policy
Change 3f(3): The Marine Strategy Framework Directive (MSFD) has a very detailed set of actions to be undertaken by MS to achieve Good Environmental Status (GES) by 2016 - these could be revised to include GI explicitly. Mapping of ecosystems and Marine Protected Areas could be added to the reporting requirements of the MSFD (which require MS to report every 3 years) with the opportunity to harmonise impact objectives and include GI elements. Indicators of GI benefits could be included in MSFD. As these will inevitably overlap to some degree with indicators of GES, those who links with green infrastructure would be more clearly identified. Member States are required to notify the Commission of their environmental targets, measures for and progress towards achieving good environmental status and monitoring programmes. Article 12 requires the Commission to assess, within six months of notification, whether these elements constitute an appropriate framework to meet the requirements of Directive 2008/56/EC and may ask the Member State concerned to provide any additional information that is available and necessary.

2 DETAILED CHANGES SORTED BY POLICY AREA

2.1 Agricultural Policy

Agricultural Policy (Option 2)
Change 2c) ***Communication and advisory measures***: EU guidance on mapping and monitoring of High Nature Value farmland should be reinforced and encouragement for experience sharing in these matters between Member States. In particular, this guidance should seek to encourage Member States to use of the Land Parcel Information System (LPIS) for monitoring landscape features more comprehensively and rigorously, and to enhance the LPIS across the EU-27 to include land use elements relevant to Green Infrastructure. In addition, Member States should be encouraged to use the training, advisory and information measures under the rural development policy to promote management related to Green Infrastructure. The Farm Advisory System would benefit from revisions aiming to provide more focused advice on Green Infrastructure-related management. Where Natura 2000 Coherence Action Plans or other plans for implementation of Article 10 of the Habitats Directive exist in Member States (see below), the agricultural authorities should be encouraged to integrate them in the relevant CAP rural development measures (GAEC cross-compliance, Natura 2000 payments, agri-environment, non-productive investments on agricultural land etc)
Agricultural Policy (Option 3)
The Common Strategic Framework (for the five funds under shared management, including total development) translates the Green Infrastructure- related objective into an investment priority including key actions and focus areas for Green Infrastructure. The mechanism for coordinating funds for an integrated approach to investing in Green Infrastructure will need to be outlined.
Within the **CAP Pillar 2 (Agricultural Fund for Rural Development)**, the mandatory character of the agri-environmental measure and minimum spend requirements relating to them are maintained. The focus on habitat restoration in agri-environment measures is strengthened; bonus/top-up payments should be granted to recipients of rural development funding (ie. under the agri-environment scheme) who commit to landscape-scale management involving multiple holdings. The establishment of connectivity features which provide added value ecologically are required as a compulsory part of investments in the measures supporting infrastructure built on agricultural land and holdings. Within the CAP Pillar 1, a range of changes are made. The greening measures introduced under Pillar 1 are based on multiannual contracts. The provisions for Ecological Focus Areas and the protection of permanent pasture as 'greening measures' under Pillar 1 make these measures mandatory and thus contribute to Green Infrastructure-related management. New mandatory provisions for GAEC standards relating to Green Infrastructure are introduced (eg minimum connectivity elements, wetland protection, permanent pasture, HNV farmland, etc) as they would positively impact on land use across the EU. Support to organic farming should be strengthening under greening measures for Pillar 1 and a bonus should be provided under Pillar 1 for Natura 2000 and HNV farms. With regard to forestry, specific measures for contractual agreements for forest ecosystem services and protection and restoration of connectivity within and between forests are introduced; a minimum spend for forest-related measures is ensured to promote the uptake of forest management beneficial to Green Infrastructure.

2.2 Forestry Policy

Forestry (Option 2)
Change 2b) Public investment: Encourage Member States to use the CAP Pillar 2 funds (EAFRD) for forestry measures and increase their uptake. In particular the actions under the forest-environment measure, agro-forestry, non-productive investments on forest land, and well designed actions for afforestation and restoration of the potential of forestry potential to support climate change adaptation, in view of increase

risk of extreme weather events such as forest fires and storms, should be encouraged.
Change 2c) Communication and advisory measures: Guidance and voluntary rules on reforestation and afforestation taking into account the maximisation of Green Infrastructure elements should be developed, providing a framework to support forest owners/ authorities to take specific contexts (ie regional needs and vulnerabilities) into account. This could include, for example, the risk of forest fires in Mediterranean forests, avalanches in Alpine forests, the effects of climate change and droughts in central Europe, amongst other factors. As a rule, genetic diversity and most adapted species should be favoured, deadwood provision encouraged etc Member States should be encouraged to develop a reference line for forest management comparable to GAEC cross-compliance on agricultural land to be able to more efficiently use the forest-environment measure under CAP Pillar 2. Environmental, agricultural and forestry authorities in Member States should be encouraged to co-operate in developing rigorous plans for afforestation measures supported by state aids or the CAP, including the identification of appropriate sites, afforestation species, management measures etc Where Natura 2000 Coherence Action Plans or other plans for the implementation of Article 10 of the Habitats Directive exists in Member States (see below), Member States should be encouraged to integrate the basic principles of these into National Forestry Plans. Finally, the EU could launch a competition and dispenses "Forest Function Awards" to private forest owners applying the highest Sustainable Forest Management standards for the provision of regionally important ecosystem services
Change 2c) Technical assistance/ Facilitation/ Governance: Establish an inter-sectoral or technical working group under the Standing Forestry Committee with a mandate to share practices, coordinate approaches and spread information on: (4) setting the objectives and developing the indicators for monitoring and mapping of Green Infrastructure and ecosystem services on forested land; **(5)** implementation of such monitoring systems and mapping approaches; **(6)** national approaches to the implementation of the MCPFE SFM commitments, particularly those which relate to GI-management and protective functions of forest. There is a need to organise temporary working groups on these issues with the aim to maximise the use of forest management plans. The working group would allow experience to be shared on the sharpening of the Sustainable Forest Management Requirements that relate to Green Infrastructure-management and the protective functions of forests, and on their integration in forest management plans. In particular, the working group should aim to define the minimum Sustainable Forest Management standards that address ecological coherence and connectivity, and explore the possibilities for an EU initiative to pursue these standards under a “Legally Binding agreement on Forests in Europe”. *Should aim at producing a common report on existing national strategies or initiatives highlighting best practices (in SFM, forest ecosystem services and protective functions, protection and forest Green Infrastructure) in order to promote a mutual learning process; maximise CAP-related funding efficiency through mapping or recording of funding relevant to Green Infrastructure on farmland and synergetic effects with adjacent forest land (see also Biodiversity Strategy 2011 "mechanisms to facilitate collaboration among farmers and foresters to achieve continuity of landscape features")
Change 2g) EU adopts **"Strategy on forest protection and information"** (based on the 2010 Green Paper) in which the establishment and preservation of forests and features relevant to Green Infrastructure is a priority in the context of climate change adaptation and disaster prevention/risk management. An important component of the strategy is a review of the EU Forest Action Plan (FAP) to enhance coordination of national approaches especially for monitoring and mapping Green Infrastructure elements and ecosystem services within and around forests. The availability of funding to support the strategy is explored, and options for earmarking funds to achieve set targets within a set timeframe are investigated. The strategy will include EU guidance for the sharpening of the SFM standards relating to Green Infrastructure-management and protective functions of forest in the forest management plans. It will include targets for: adaptive afforestation; reduction of damage at felling; genetic diversity of forests;, increased adaptive capacity of forests; key elements of functional connectivity (eg maintenance of understorey; vegetation soil cover; dead wood; genetic improvement of the adaptive potential (eg through inter-species diversity) with a particular focus on forests in climate vulnerable regions (this needs more research in many cases). Another strategic

objective could involve a commitment to define a certain percentage of wilderness area in forests to be designated as core green infrastructure. The percentage could be set at national level and be variable depending on national circumstances and in particular current endowment in wilderness area (in addition, the percentage could also be set at the holding level and could differentiate between large and small holdings). The Strategy would also coordinate the identification, mapping, measurement and monitoring of Green Infrastructure elements relevant to forests as a component of wider forest monitoring. Reporting on the implementation of the Strategy (including improved reporting to the MCPFE on indicators of SFM), integration of the strategy objectives in other EU forest relevant policy documents (eg RES-D, Directive on marketing of forest reproductive material, EU policies on forestry and forestry based industries)

2.3 Biodiversity and Nature Conservation

Biodiversity and Nature Conservation (Option 2)
Change 2a) Within the framework of the OMC, interested MS could draw up green infrastructure and Natura 2000 Coherence Action Plans (APs) to be integrated in their existing spatial and regional planning tools and would aim to improve habitat conditions within Natura 2000 and to enhance connectivity with the wider environment. Potentially, they could also include the identification of needs for new sites, site enlargements, buffer zones, and enhancement of corridors between different landscape elements as well as restoration priorities which are thought to be achievable in a cost-effective way if integrated with other spatial planning projects. Finally, these APs could also consider further utilisation of PES schemes and other innovative financing measures.
Change 2b) LIFE+ integrated projects should be promoted further as a means of funding Green Infrastructure, especially given that Green Infrastructure contributes to meeting objectives set in multiple policy areas. Also under **LIFE+,** demonstration projects which rely on Green Infrastructure (ecosystem based solutions) to deliver environmental objectives have priority over projects which deliver the same objectives through other means. Increased use of LIFE funds for capacity building on issues concerning Natura 2000 coherence and wider connectivity issues; Increase in LIFE+ biodiversity funding, with an earmarked budget for Natura 2000 coherence measures as part of a Prioritised Action Framework (PAF); The new climate change component of LIFE+ which is proposed for the 2014 - 2020 period will provide financing in three strands: mitigation, adaptation and governance/awareness. The aim is to provide 'seed money' which can catalyse innovative solutions to climate change issues (including ecosystem-based mitigation and adaptation options). The focus will be on testing demonstration projects which can then be replicated under larger funds such as EAFRD and Cohesion Policy.
Change 2c) Communication and advisory measures: Member States to consider adequately coherence issues in Appropriate Assessments. Revised **EU guidance regarding Appropriate Assessments** (Article 6 Assessments) suggests that Member States should produce Natura 2000 site management plans that identify coherence needs for vulnerable species and ecosystem processes. Guidance on the Habitats Directive and Birds Directive to require adequate consideration of coherence issues in the assessment of impacts, compensation and liabilities under these Directives. European Commission to produce technical guidance and tools to assist Member States in preparing Natura 2000 Coherence Action Plans, implementation of Article 10 of the Habitats Directive and other connectivity issues.
Change 2d) Information gathering and mapping: Improved research on fragmentation / habitat coherence impacts on species and habitats of Community interest and birds listed in Annex I of the Birds Directive, and monitoring of the ecological benefits of Green Infrastructure measures. Improved monitoring of species and habitats of Community interest and Annex I birds, so that the status of all are reliably known. Green Infrastructure is one of the priority areas for research under the future Horizon 2020 – the Framework Programme for Research and Innovation.
Change 2f) A Gateway for European Green Infrastructure information is created: A gateway for European Green Infrastructure information would be set up following the model of WISE (Water Information System for Europe) and BISE (Biodiversity Information System for Europe). It could also be an expansion of BISE. This would become a key element of the institutional structure to promote the development of Green

Infrastructure across the EU and would facilitate the exchange of experiences and information. A platform based on the model of WISE would serve in particular as an 'Information Gateway' collecting, processing and disseminating information on Green Infrastructure. As for WISE, this information platform could be created by the European Commission in collaboration with the European Environment Agency (EEA).

The Gateway would consist of technical information and data on Green Infrastructure, but would also serve as the communication platform on policies for Green Infrastructure implementation and would provide clarifications and illustrations of the implications of these policies across different sectors (including, for example, sector specific guidance documents). Moreover, information and results from a wide array of research projects addressing the different Green Infrastructure sub-topics will be made available in a comprehensive manner. Linking research results and information to responsible research institutes and individuals would allow for a better exchange of information among researchers, experts and practitioners, as would allow these groups to know where and from whom information and experiences can be obtained.

The platform , would bring together information gained from the implementation of the measures outlined under option 2, which suppose a high level of coordination. As data, maps and technical information would represent a high share of the information to be processed and published, it could make sense to assign the responsibility for the platform to the EEA and/ or the JRC.

Finally, as for the Natura 2000 portal, the most relevant maps and data could be retrieved from the portal (eg harmonised maps of Green Infrastructure produced for the EU level).

Biodiversity and nature conservation (Option 3)

Should the Habitats Directive undergo a revision, this could be seized upon as an opportunity to introduce a selected number of changes to enhance its effectiveness in preserving protected areas, the backbone of Europe's Green Infrastructure. This would be achieved in particular by clarifying a selected number of articles and emphasising the need for proactive steps towards ensuring the coherence of the Network, to improve monitoring measures and to adopt long-term funding strategies. More specifically, the Habitats Directive could undergo the following revisions:

- Article 3 of the Habitats Directive to require all Member States to assess coherence and develop Action Plans to tackle deficiencies;
- require Member States to produce site management plans for all Natura 2000 sites identifying coherence needs for vulnerable species and ecosystem processes;
- ensure the ecological impacts of Article 6.4 compensation measures are adequately monitored and to ensure Member States consider adequately coherence issues in Appropriate Assessments;
- requirement for Member States to produce long-term funding strategies that are adequate to meet the objectives of the Directives.

2.4 Water Policy

Water Policy (Option2)

Change 2b) Public investments: Natural water retention measures are recognised as offering the potential for cost savings and multifunctional benefits. Such measures are applied in pilot projects in Member States, primarily funded under Cohesion Policy in urban areas and the EAFRD in rural areas (see Cohesion Policy and agriculture). Water authorities in charge of developing and implementing the River Basin Management Plans may receive support from Cohesion Policy funds for the active purchase of land to re-establish ecological continuity and develop blue infrastructure measures. In rural areas, ecosystem-based approaches for water treatment and purification should be equally considered in rural development programmes and project feasibility studies. Ecosystem-based water purification projects can be prioritised through project selection

criteria that are favourable to Green Infrastructure. The management of purchased land can then be set within the framework of long term leases. Authorities in charge of implementing the River Basin Management Plans are encouraged to draft Multiannual programmes for the restoration of ecological continuity of water bodies and Cohesion Policy funds are used to support their implementation. The coordination between expenditure under the CAP, Cohesion Policy and LIFE targeting flood management, wetland restoration, etc should be improved so as to ensure that actions are complementary and duplication is avoided, thereby strengthening the efficiency and effectiveness of public expenditure.
Change 2c) Communication and advisory measures: Updated EU guidance on drafting national River Basin Management Plans recommends that a concept for water-related Green Infrastructure measures (including natural water retention measures) is present and budget and funding estimations are provided. Guidance and toolkits are produced at European level to support the implementation of water-related Green Infrastructure at Member State, regional and local level. Best-practice with regard to using economic instruments (water pricing and Payments for Ecosystem Services) for ecosystem services is shared in the guidance. As a first step, guidance should recommend that all water management plans under the Water Framework Directive identify the provision of water, as an ecosystem service, when identifying all the sources of water (ie groundwater, surface water etc) and their users. Guidance: Best practice in implementing Green Infrastructure water-related elements in some Member States is established. Guidance is developed including some of the best EU ecosystem-based approaches and projects on measures for natural water retention. Guidance is provided to Member States, regions and rural areas regarding how Green Infrastructure water-related projects can be prioritised in expenditure programmes for EU funds and financed by EAFRD, ERDF and/or LIFE+.
Change 2d) Technical assistance: Authorities responsible for the implementation of River Basin Management Plans may benefit from EU funds for organising training for Green Infrastructure planning, mapping (for example of inventories of obsolete infrastructure) monitoring and the design of measures relying on Green Infrastructure. Technical assistance under the Joint Assistance to Support Projects in European Regions (JASPERS) programme provides assessment of the feasibility of Green Infrastructure elements as part of water treatment projects.
Water Policy (Option 3)
Change 3f)(2): The Future EU Water Blueprint could call for the opportunity costs of natural water retention measures to be considered systematically and where relevant translated into land acquisition, compensation or service payments. The Water Blueprint calls for introducing fair water pricing policies to ensure that major water users contribute adequately to the financial and environmental resource costs of water services. This also identifies EU funding instruments which can support investigation and implementation of ecosystem-based solutions such as natural water retention measures. For example maps and models taking into account aspects of Green Infrastructure are developed, such as river banks and wetlands, but also storm water in addition to water quality and hydromorphology (ie maps in River Basin Management Plans and mapping water quality for the Bathing Water Directive). Appropriate funding for ecological flood risk management under the Flood Risk Management Directive is ensured. River Basin Management and Integrated Constructed Wetlands are supported, following best practice examples. As a result the revised Water Framework Directive calls for the authorities responsible for the development and implementation of River Basin Management Plans to ensure that fair water pricing is introduced. In addition, the Directive ensures that some of this money is invested in securing the availability of water and improving its quality through the appropriate creation and management of Green Infrastructure (ie through the acquisition of land, compensation, or establishment of Payments for Ecosystem Services schemes at the river basin scale).

2.5 Climate Change Policy

Climate Change Policy (Option 2)

Change 2c) Investments & technical assistance/advisory measures: Common Strategic Framework funds (eg Cohesion Policy [including JASPERS], EAFRD and EMFF) provide technical assistance to regional administrations that wish to promote Green Infrastructure in climate change adaptation and mitigation activities. Funding is made available for projects which seek to reduce the vulnerability of a region and enhance the resilience of the EU to the impacts of climate change. The climate component of LIFE+ is used for innovative and demonstration projects for Green Infrastructure measures for climate mitigation and adaptation. The governance strand of the LIFE+ climate component can provide financing for technical assistance, policy advice and capacity building for regional authorities preparing their climate change adaptation strategies, in which Green Infrastructure elements are incorporated.
Climate Change Policy (Option 2)
Change 2d) Information gathering and mapping: Promotion and coordination of the research activities at the EU level on the potential of Green Infrastructure to reduce the vulnerability and enhance the resilience of the EU to climate change. An EU-wide research project is to identify areas particularly vulnerable to climate change and at risk of losing ecosystem services if no restoration activities for degraded ecosystems are undertaken. The EU should take this mapping into account for when allocating funding to projects aiming to increase resilience through Green Infrastructure. Following the above mentioned research activities, guidance documents are developed, advice is provided and capacity building takes place related to ecosystem based climate change adaptation at the EU level (see Cohesion Policy and LIFE+ integrated projects and innovative financing for this).

2.6 Territorial Cohesion and Innovative Financing

Regional Policy and Innovative Financing (Option 2)
Change 2b) Cohesion Policy Programmes supporting integrated urban development and community-led actions should promote effectively initiatives for ecosystem-based urban micro-climate regulation. Such initiatives include: the cooling effect of green spaces and insulation of buildings through Green roofs. Furthermore, policy programmes should promote measures for climate change adaptation, measures to improve the resilience of man-made and natural capital in urban settings and for developing the adaptive capacities of communities, administrations and other stakeholders. Where projects can be revenue-generating (such as for energy efficiency), the use of innovative financial instruments such as Joint European Support for Sustainable Investment in City Areas (JESSICA) can be established while freeing up grant money for Green Infrastructure, ecosystem-based measures and climate adaptation. **Change 2b)** Water Management Authorities (that draft and implement the River Basin Management Plans) can develop "Multiannual programmes for the restoration of ecological continuity of water bodies" and apply for funding for these under the European Regional Development Fund (ERDF). The scope of JASPERS can be expanded to provide technical assistance for Green Infrastructure by integrating expertise on -financing and biodiversity-proofing the large infrastructure projects promoted under Cohesion Policy. The scope of JASPERS can be further extended to provide assistance for Green Infrastructure issues in EU-15 Member States where there are deficits in capacity (see technical assistance).
Change 2c) Communications and advisory measures: EC to inform / disseminate best practice examples of projects which protect, maintain or restore elements of Green Infrastructure to demonstrate benefits. Guidelines developed for Green Infrastructure at national/regional levels targeting managing authorities, beneficiaries and project promoters. Guidance to regions to illustrate which type of projects are eligible for funding. Encourage increased demand for funding for Green Infrastructure projects by disseminating evidence on the need and the benefit of such projects through the managing authorities of Operational Programmes. Authorities in Member States encouraged particularly to provide more targeted support and

capacity building for Green Infrastructure project design and implementation at lower tiers of governance. The guidance should also provide an indication of the investments that tend to result in a high risk to green infrastructure and propose instrument/tools for minimising their adverse impacts

Greater guidance and support to be given to Member States and regional levels to ensure that environmental considerations are taken into account in the design of programmes. Guidance to be given on identifying best practice, highlighting Environmental Impact Assessments and Strategic Environmental Assessments which have takeninto account Green Infrastructure.

Advise all Operational Programme managing authorities to install an Environmental Sustainability Manager to enable more effective promotion of Green Infrastructure and co-ordination and integration across policies. Exchange information on best practice in the implementation of Green Infrastructure through the creation of national environmental networks and creation of a Green Infrastructure working group within the European Network of Environmental Authorities and Managing Authorities on Cohesion Policy (ENEA-MA). Awareness raising and guidance to monitoring committees (which usually include non-environmental authorities and stakeholders) to integrate Green Infrastructure considerations into their activities (eg project selection development, revisions of OPs, annual reporting, etc)

Change 2c) Technical assistance: Technical assistance for Green Infrastructure provided through JASPERS. The financial framework for the urban environment is used to a greater extent to support projects which deliver environmental objectives through Green Infrastructure. Through guidance and training, the regional level is encouraged to propose projects which demonstrate positive outcomes from Green Infrastructure and therefore allow for the identification and quantification of benefits, at this level or more locally. In particular, Cohesion Policy provides technical assistance to regional administrations that wish to promote Green Infrastructure through ecosystem-based solutions, including in climate change adaptation and mitigation activities, ecological wastewater treatment plants and Natural Water retention measures. Train Operational Programmes and regional management bodies on the concept of Green Infrastructure and build awareness of benefits so that a larger number of such projects are developed and ownership is increased.

Change 2g) Strategies and Action Plans: EU encouragement of Green Infrastructure as a new priority area. For example, the European Commission publishes a Communication entitled 'Natural Assets for Cohesion Policy and Green Growth'. As a result, the Green Infrastructure concept is integrated further into Macro-Regional Strategies which seek to provide a framework for integrated expenditure planning at the level of functional geographies (eg Danube and Baltic), primarily implemented by mobilising and aligning existing funding to its objectives. The Macro-Regional Strategies clearly recognise each region's specific natural assets and likely need to invest in natural capital, in particular in the context of adapting to climate change. For Macro-Regional Strategies, the setting of targets specific to the region's Green Infrastructure is explicitly encouraged. The Action Plans accompanying the Macro-Regional Strategies support the relevant priority Green Infrastructure measures for the region. For example, in the case of the Danube, priorities will be to restore and maintain the quality of water, to manage environmental risks, to preserve biodiversity, landscapes and the quality of air and soils. For the Baltic Sea, particular priorities will be to use Green Infrastructure for the reduction of the flow of nutrients into the sea and the development of natural fish nurseries (including through European Marine and Fisheries Fund (EMFF) funding).
The Commission Communication makes clear that Cohesion Policy will support the implementation of the Adaptation Strategy which is due 2013. It should especially do so with regard to disaster risk reduction and the cost-effective reduction of vulnerability and impacts through "softer" measures (i.e. ecosystem based solutions) should be a key element to pursue this objective.

Regional Policy and innovative financing (Option 3)

The Common Strategic Framework (for the five funds under shared management, including total development) translates the Green Infrastructure- related objective into an investment priority including key actions and focus areas for Green Infrastructure. The mechanism for coordinating funds for an integrated approach to investing in Green Infrastructure will need to be outlined.

Change 3g) The new Regulation on laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and repealing Regulation (EC) No1083/2006:

- Includes "Enhancing Europe's green infrastructure and ecosystem resilience" in the list of **thematic**

objectives and this is reflected in **priority interventions** specified in the Fund-specific Regulations and the categories of expenditure (Annex) which includes a range of investments in Green Infrastructure, reflecting its multipurpose character. Such investments include: improving quality of life; health (air quality); resilience of economies andurban areas to climate change; flood risk prevention and management; energy efficiency; attractiveness of places.

- Foresees differentiated **co-financing rates** (higher EU co-financing rate for Green Infrastructure projects when these are to be implemented in Green Infrastructure creation/restoration zones identified in European Environment Agency maps) and support to Green Infrastructure projects as part of the LIFE+ integrated instruments.
- Encourages Member States to include Green Infrastructure as a priority in **Partnership Contracts** and Operational Programmes and give ecosystem-based solutions (Green Infrastructure projects) priority over alternatives during the **project selection process.**
- Regions applying for funding under the Cohesion Policy are requested to establish an **environmental baseline** which includes stocks of Green Infrastructure elements (which are integrated into the 'Strengths, Weaknesses, Opportunities, Threats' analysis, ex-ante evaluation and Strategic Environmental Assessment). Regions are requested to assess how a programming period is expected to affect Green Infructure stocks and monitor andreport on stocks on a regular basis within the proposed **performance framework**, which includes targets, milestones and indicators for Green Infrastructure.
- Establishes a **performance reserve** linked to the enhancement of Green Infrastructure to reward projects that do not have GI at their core but nonetheless deliver benefits for Green Infrastructure. **Suspension of funding** is also envisioned in the case of expenditure that has severe negative impacts on the integrity of ecosystems.
- As part of the **thematic and horizontal ex-ante conditionality** proposed in the Regulation, Cohesion Policy funding of grey infrastructure projects is subject, inter alia, to following ex-ante conditionality: (a) full mapping and identification of the region's Green Infrastructure according to the criteria foreseen in the Green Infrastructure mapping provisions (b) demonstration of the capacity to apply governance instruments such as Strategic Environmental Assessment and Environmental Impact Assessment for programmes and projects.

Innovative financing: JASPERS could provide technical assistance on the development of Green Infrastructure projects and/or the inclusion of Green Infrastructure and biodiversity proofing elements in the feasibility studies for large scale infrastructure. JESSICA could be used to support projects delivering energy efficiency improvements through the use of trees and plants to cool urban temperatures, reducing energy needs for cooling (as foreseen by the European Commission's 2011 Energy Efficiency Plan). This would thereby free up grant money under the ERDF for non-revenue generating projects focused on ecosystem-based climate adaptation projects, for instance those focused on the mitigation of flood risk and on water, air and ecosystem quality.

2.7 Transport and Energy Policy

Transport and Energy (Option 2)
Change 2c) Communications and advisory measures: The 2011 white paper on transport impact assessment would provide a definition of "Green Infrastructure" which is compatible with the one promoted by DG ENV. Along with the TEN guidelines, the white paper would encourage MS to incorporate provision of (adequate) green infrastructure into public procurement contracts for transport and energy infrastructure, this includes measures such as the construction of green bridges but could also be, for example, provision of low vegetation for carbon storage along motorways. A new guidance document on adequate consideration of GI should be prepared for all financing under the future Connecting Europe Facility. It should address all issues and provide both best practice examples and GI relevant guidance on consideration of GI in feasibility studies (valuation of BD and ESS), and Road and Energy EIA and SEA. Advice should include:

- explicit mention of the need to minimise impacts on GI and seize opportunities to strategically develop green infrastructure alongside grey infrastructure - a recommendation that under the European Social Fund, funding is made available for training for managing authorities, spatial planners and civil engineers to incorporate GI in transport and energy infrastructure development programmes and projects - a recommendation that projects applying for funding should be part of Integrated Transport Planning processes that take into account the need to preserve GI at all territorial levels (European, national, regional and local)
Transport and Energy (Option 3)
Change 3d): The provisions governing the functioning of the **Connecting Europe Facility** stipulate the following: d) All projects should be biodiversity and climate proofed. As for Cohesion Policy, this is to be achieved by integrating GI relevant evaluation criteria in a transparent scoring/ pointing system which will disqualify/ downgrade projects with likely negative impacts on GI. At the same time, projects which make particular efforts to minimise impacts on GI (such as fragmentation, land take), for example by combining transport and energy distribution networks, get bonus points. e) All applications for funds include harmonised GI maps (meeting minimum requirements/ standards established at EU level - see change 3b) are prepared based on the information transmitted. The proposed physical infrastructure developments are presented on these maps and the impact assessment should convincingly demonstrate that the option chosen is the one that minimises impacts on the existing Green Infrastructure. This is reflected in the scoring system. f) The EU share of co-financing under the Connecting Europe Facility is increased when developers who apply for funding under this Facility add to their project proposal a plan committing them to investing 3% of the co-financing funds in increasing connectivity between Natura 2000 sites located in close proximity. In this case, together with the application for funding, the developer submits a report analysing which is the most cost-effective option to deliver ecosystem and biodiversity benefits and clarifies which option has been retained and why (ie beyond wildlife crossing, consideration should systematically be given to other options such as GI creation and restoration near the N2K sites). g) MS to allocate proportion of road user fees for maintenance and enhancement of GI associated with roads, such as wildlife corridors – instead of having to invest 15% of the funds generated by the eurovignette tools in priority projects of TEN-T, MS may also decide to spend it on road infrastructure mitigation projects.

2.8 Impact Assessment, damage prevention and remediation

Impact assessment and liability (Option 2)
Change 2c) Communications and advisory measures: Increased guidance to ensure best practice sharing in integrating GI elements; EIA and SEA guidelines should: • provide unified criteria for better GI consideration. Checklists should be revised to integrate tools relevant for an appropriate consideration of impacts on GI in impact assessments; • recommend indicators for assessing impacts of developments on GI elements and ESS (for full integration of BD and ESS impacts, including social benefits) and provides recommendations for impact avoidance and mitigation. • illustrate how coherence, connectivity and resilience to climate change (expanding the spatial and temporal scope) can best be taken into account. • promote best practice in consultation procedures/ participatory processes in EIA and SEA to better take into account GI and its benefits (eg recreation, health etc). • emphasize the need for creation and preservation of GI through measures to prevent, reduce and where possible offset any significant adverse effects on GI but also stress the scope within EIA/SEA to

identify positive opportunities for enhancing GI and seizing opportunities to support biodiversity (connectivity) and provide ecosystem services (eg green roofs, carbon storage, etc).

- encourage/require the use of SEA (which should consider GI) when developing spatial policies and (development) plans.
- include clarification and guidance on application of SEA to Cohesion Policy funds by updating the SEA handbook for Cohesion Policy.[2]
- for EIA, provide unified criteria for better GI incorporation. Produce GI guidelines on joint procedures for requirement fulfilment.
- improve the coordination between EIA, SEA and Appropriate Assessments of the Habitats Directive in terms of GI.

Change 3e): **Revision of the EIA/SEA Directives**: A reform of the EIA and SEA Directives would ensure a fuller consideration of impacts of development projects on GI and its coherence (eg expanding guidelines to cover any projects and programmes which have impacts on any GI element and adapting the depth of EIA and SEA to the scale of development to ensure effort is proportionate to likely impact). In effect, this would mean that the criteria for cases in which an EIA/SEA has to be carried out could be expanded in more detail and further harmonised (eg requirement for a wider range of developments, ie smaller projects; requirement for using SEA when developing spatial policies and plans; detailed requirement to consider GI as part of the environmental assessment; systematic requirement for EIA/SEA for any EU funded project or programme which may affect any type of GI element); clarification/revision of the list of impacts to be considered (eg could be expanded to include impacts on all GI elements and/or to take into account impact on overall coherence and ESS, in particular in view of a better consideration of the requirements of Art. 6(3) of EU's Habitats Directive).

The revision of EIA/SEA Directives would make the guidance (cf. option 2) a more integral part of EIA/SEA processes. For example, the adequate consideration of vulnerability to climate change when developing spatial plans would be recommended. The revised EIA/SEA Directives would in particular require that GI maps be systematically used when presenting alternative options under consideration and that the ecosystem services associated with the potentially impacted GI elements be identified. Also, measures to avoid, reduce, mitigate and compensate inevitable impacts on landscape larger range of landscape connectivity features should be systematically foreseen. These could in particular contribute to mitigating the loss/ deterioration of key "ecological continuities"/connectivity elements, including for smaller scale developments, as such efforts do not have to be overly expensive to achieve positive results. Preferred options should tend towards no net loss of key GI elements and be those which fragment and undermine the overall coherence of GI least.

2.9 Spatial Planning

Spatial planning (Option 2)

Change 2d) Research: Promote further GI-related technical assistance through the ESPON 2013; in particular, further exploit the opportunities offered by priority lines 1, 2 and 3 of ESPON 2013 to finance projects that incorporate the GI concept in order to create information, indicators, territorial data and tools as a contribution to the territorial cohesion approach. In particular, activities to support GI could be incorporated under the priority lines which support research on the environment (including natural resources, risks, biodiversity, Natura Network sites and other themes) with the purpose of aiding in the elaboration of territorial planning tools that incorporate territorial cohesion and sustainability. Should there be a follow-up programme for ESPON, it should be ensured that it can financially support the mapping of GI elements in regions which are Cohesion Policy beneficiaries (as mapping might become obligatory under

[2] GRDP. 2006. SEA Handbook. http://ec.europa.eu/regional_policy/sources/docoffic/working/doc/sea_handbook_final_foreword.pdf

option 3).
Change 2e) EU GI integration toolkit for spatial and regional planners: Under this measure, the EU would develop a toolkit to support spatial and regional planners in better taking into account green infrastructure. Building on respective mandates from the 1999 European Spatial Development Perspective (ESDP) and the 2011 Territorial Agenda, the EC GI toolkit would outline the ways in which a more integrated approach to spatial and urban planning would consider green infrastructure elements. The toolkit would address key issues of relevance to green infrastructure implementation such as the restoration of ecosystems, maintenance and enhancement of protected areas (Natura 2000), the integration of ecological corridors and the need to reconcile ecological functions with economic exploitation. The toolkit, supported by the approach to GI adopted in the Strategy, would make clear that a pre-requisite of meaningful integration of GI into planning strategies is the setting of clear and reachable targets for future planning within the relevant documents. For multi-level planning structures (such as in Germany), it would recommend that targets and objectives are consistent across levels and that competing demands on land use are considered upfront in the strategies. As maps fulfil a core function in improving the incorporation of green infrastructure in spatial planning, consideration should be given to the establishment of a taskforce to develop guidance on technical and institutional aspects related to mapping Green Infrastructure elements. This taskforce could be coordinated by the EEA and would include a representative range of experts and key stakeholders. In line with the subsidiarity principle, EU MS would carry out GI mapping themselves. However, the taskforce could adopt the role of compiling MS results to provide an EU wide assessment of current implementation and status of GI. It would also encourage MS to apply GIS tools in spatial planning and to make use of the information from Spatial Observatory Networks to determine trends of territorial development and their relation to further GI integration. Special advice relating to the benefits of urban GI would also be provided with the intention of making planners aware of the potential cost-savings that can be obtained by using Green Infrastructure. In order to visualise the benefits gained from better consideration of GI in the planning process, the toolkit would also introduce valuation methods. Key EU level Strategic documents relating to spatial planning and integrated territorial development could be further aligned with the green infrastructure approach. Key strategic instruments which already provide relevant hooks could be referred to. The ESDP, for example, proposes the preservation and restoration of large wetlands endangered by excessive water extraction or the diversion of inlets, and the concerted management of the seas, in particular, preservation and restoration of threatened marine ecosystems. In addition, under the objective 'territorial polycentric development and new rural-urban relationship' the ESDP points out the importance of green spaces in cities. The integration of GI in spatial planning would require a reform of spatial planning laws in many countries. To encourage the dissemination across MS, the toolkit would build on and refer to practical examples drawn from existing initiatives (eg Stockholm's blue-green infrastructure-RUFS 2010) while at the same time providing information about possible sources for support (ie ESPON, LIFE+). Cities, for example, would be particularly encouraged to draft climate change adaptation plans incorporating green infrastructure and EU would ensure that its funding instruments provide incentives to adopting green infrastructure based approaches in spatial planning.
Change 2g) Strategies and Action Plans: A revision of the Thematic Strategy on the Urban Environment is carried out. The revised version makes a clear reference to the role of Green Infrastructure in improving the urban environment, and contributing to improvements in quality of life and the provision of a range of key ecosystem services. The importance of services and health benefits linked to recreation, improvement in air quality, micro-climate regulation, water runoff management, sustainable transport (ie green lanes for pedestrians and cyclists), energy savings and environmental risk management is acknowledged, and ecosystem based solutions for delivering these services are encouraged. The revised Thematic Strategy on the Urban Environment makes reference to the funding instruments which may finance projects and provide technical assistance. In addition, the Financial Framework for the Urban Environment (Decision No 1411/2001/EC) is revised to clearly commit to this new orientation.

2.10 Marine and Coastal zones Policy

Marine and coastal zones Policy (Option 2)
Change 2b) E(M)FF could be used to support measures relying on GI to meet objectives of the MSFD, in particular achieving Good Environmental Status (GES) by 2020. The EMFF proposal includes an axis for the Integrated Maritime Policy as well as an axis for sustainable development of fishing areas. This could fund restoration activities eg restoring salt marshes to create coastal fish nurseries to replenish fish stocks and improve coastal protection in view of adapting to climate change and extreme weather events. There would be the possibility to include more emphasis on restoration programmes eg in protected areas to support the improvements in ecological quality newly designated Marine Protected Areas) through the E(M)FF (ie management of GI).
Change 2c) Guidance: (Revised) ICZM recommendations suggest that national Strategies should foresee/encourage measures for the identification and protection of key GI in protected areas, through the use of tools such as land purchase and declarations of public domain, as part of an integrated management of the coastal zones which is to be protected. The protection of still unspoilt coastal areas and open access to coastal areas is promoted. ICZM refer to the need to additionally identify restoration areas with a view to adapting to climate change and investing in natural costal defence. EFF money is available to support these activities, with the potential for particularly favourable co-financing rates where ecosystem based solutions have been selected.
Marine and coastal zones Policy (Option 3)
The Common Strategic Framework (for the five funds under shared management including the E(M)FF) translates the GI related objective into an investment priority including key actions and focus areas for GI. The mechanism for funds coordination for an integrated approach to investing in GI will have to be outlined.
Change 3f(3): The Marine Strategy Framework Directive (MSFD) has a very detailed set of actions to be undertaken by MS to achieve Good Environmental Status (GES) by 2016 - these could be revised to include GI explicitly. Mapping of ecosystems and Marine Protected Areas could be added to the reporting requirements of the MSFD (which require MS to report every 3 years) with the opportunity to harmonise impact objectives and include GI elements. Indicators of GI benefits could be included in MSFD. As these will inevitably overlap to some degree with indicators of GES, those who links with green infrastructure would be more clearly identified. Member States are required to notify the Commission of their environmental targets, measures for and progress towards achieving good environmental status and monitoring programmes. Article 12 requires the Commission to assess, within six months of notification, whether these elements constitute an appropriate framework to meet the requirements of Directive 2008/56/EC and may ask the Member State concerned to provide any additional information that is available and necessary.

2.11 Environment and Health

Environment and Health (Option 2)
Change 2g) Strategies and Action Plans: The next Environment and Health Action Plan should also aim at stepping up cooperation between stakeholders in the environment, health and research fields around questions relating to the linkages between green infrastructure and human health. A future action plan should acknowledge the role of green infrastructure in reducing air pollution (ie reducing exposure to pollution and noise and lessening of urban micro-climate regulation/ heat island effect which reduces air quality, eg by creation of ozone) and supporting healthy lifestyle choices. It should also promote the inclusion of 'proximity to urban green space' or 'urban green space per capita' among health related indicators as they have proven to be correlated with health.

A research Agenda into the links between GI and respiratory diseases should be further promoted in the next Environment and Health Action Plan (see research section below for more detail).
Change 2e) Research: A research Agenda into the links between GI and respiratory diseases should be further promoted in the next Environment and Health Action Plan (see research for more detail). Other issues to be investigated include: the capacity of green roofs and urban green spaces to mitigate the urban heat island and reduce the magnitude and duration of heat waves, and the possible contribution of urban green spaces to further improving air quality. In addition, green infrastructure may contribute to reducing obesity by offering space for outdoor recreation and exercise. The role of riparian vegetation in reducing the risks of high concentrations of nitrates in drinking water or pollution of bathing water could also be a topic. Where relevant and definitive, conclusions should be reflected in air and water policies.

2.12 Research Policy

Horizon 2020
Green Infrastructure is made one of the priority areas for research activities under the future Horizon 2020 framework programme for research and innovation as considered key to contributing to the necessary transformations towards a resource efficient, low carbon and resilient bio-economy.
Biodiversity and nature conservation
Change 2d) Information gathering and mapping: Areas where research effort would be scaled up would include: improved research on fragmentation/ habitat coherence impacts on species and habitats of Community interest and Annex I birds; monitoring of the ecological benefits of GI measures; Improved monitoring of species and habitats of Community interest and Annex I birds, so that the status of all are reliably known.
Change 2d) Research: The research Agenda would reflect some of the recommendations from EPBRS's assessment of the research needs on "Biodiversity and Planning". **The EU Biodiversity strategy 2020 – research needs** • improve baseline information and assessments of species and habitat distribution, status and trends, and human dependencies on the services they provide (>> target 2, action 5) • examine how the concept of green infrastructure and ecosystem restoration can provide sustainable nature conservation (>> target 2, action 6 a, b) • examine the concept of biodiversity offsets, and how, and under what conditions, they might contribute to "no net loss" of biodiversity (>> target 2, action 7) **Habitat and species conservation under climate change** • develop methods to restore, maintain or improve the ecological functioning of protected areas, landscapes and seascapes for biodiversity conservation • develop planning and management strategies that enhance the connectivity between protected areas to improve species exchange. • better understand the perceptions and knowledge of site managers and owners in order to develop strategies that optimise adaptive management • develop a database about the relationship between spatial characteristics of landscapes and ecological networks and ecological processes in populations and ecosystems, to be applicable in developing planning targets and designing spatial solutions **Planning for sustaining and restoring ecosystem services** • better understand the disruption of ecosystem processes which result in depleted ecosystem services, at various scales in time and space, caused by natural and anthropogenic drivers, • develop and apply standardized indicators, methods and criteria for the measurements, mapping and assessment of ecosystem services for various temporal and spatial scales (>> target 2)

- further develop cost-benefit assessments of ecosystem services (and other economic instruments) to identify optimal uses of resources
- develop stakeholder-oriented science-based tools for collaborative planning and design of ecosystem services in multifunctional and urban landscapes

Mainstreaming biodiversity planning into sectoral policies

- better quantify the impacts on biodiversity of existing and future policies (e.g. common
- agricultural and fisheries policies), such as those addressing land and sea use, by means of interdisciplinary and cross-sectoral research
- identify planning tools applicable across sectors in order to avoid or reduce these impacts develop better ways to involve regional stakeholders in awareness, use and maintenance of planning issues related to biodiversity

Climate Change Policy

Change 2d) Information gathering and mapping: Improve information gather and mapping in relation to green infrastructure for climate change adaptation and mitigation would involve the promotion and coordination of the research activities at the EU level on the potential of GI to reduce the vulnerability and enhance the resilience of the EU to climate change. An EU-wide research project could be initiative with the aim to identify areas particularly vulnerable to climate change and at risk of losing ESS if no restoration activities for degraded ecosystems are undertaken. EU should take this mapping into account for allocation of funding to projects aimed at increasing resilience through GI. The EU would also support the development of relevant guidance documents and the provision of advice and capacity building related to ecosystem based CC adaptation at the EU level (see CP and LIFE+ integrated projects and innovative financing).

Spatial planning

Change 2d) Research: Promote further demand for GI-related technical assistance through the ESPON 2013. In particular, further exploit the opportunities offered by priority lines 1, 2 and 3 of ESPON 2013 to finance projects incorporating the GI concept in order to create information, indicators, territorial data and tools as a contribution to the territorial cohesion approach. In particular, activities to support GI could be incorporated under the priority lines which support research on the environment (eg natural resources, risks, biodiversity, Natura Network sites and other themes), with the purpose of aiding in the elaboration of territorial planning tools that incorporate territorial cohesion and sustainability. Should there be a follow up programme for ESPON, it should be ensured that it can financially support the mapping of GI elements in regions which are CP beneficiaries (as mapping might become obligatory under option 3).

Environment and Health

Change 2d) Research: A research Agenda into the links between GI and respiratory diseases should be further promoted in the next Environment and Health Action Plan (see research for more detail). Other issues to be investigated include: the capacity for green roofs and urban green spaces to mitigate the urban heat island effect and reduce the magnitude and duration of heat waves and the possible contribution of urban green spaces to further improving air quality. In addition green infrastructure may contribute to reducing obesity by offering space for outdoor recreation and exercise. The role of riparian vegetation in reducing the risks of high concentrations of nitrates in drinking water or pollution of bathing water could also be a topic. Where relevant and definitive, conclusions should be reflected in air and water policies.

Soil Policy

Change 2d) Research: Horizons 2020 would also support research activities relating to the interlinkages between soil functions and green infrastructure and the identification of the potential of green infrastructure to be used to address some of the threats to soil identified in the 2006 Strategy Thematic Strategy in view of promoting best practice in this regard and financing cost-effective interventions through the EU budget.

2.13 EC external development cooperation

EC external development cooperation (Option 2)
Change 2b) Public investments: The next 'Environment and Natural Resources Thematic Programme' (ENRTP) foresees financing for ecosystem-based approaches to delivering services such as carbon storage, flood prevention/water management (quantity), wastewater management and water cleansing (quality), and provides incentives for developing countries proposing such projects. In other programmes which are more concerned with the development of grey infrastructure (eg road and electricity distribution networks), EIAs and cost-benefit analysis should include requirements to clearly acknowledge the impacts of projects on Green infrastructure and related ecosystem services in order to ensure that ways to minimise impacts are devised. Funding is made conditional on adequate mitigation and the choice of the option which minimises adverse impacts.