

COMMON IMPLEMENTATION STRATEGY FOR THE WATER FRAMEWORK DIRECTIVE



WFD and Hydro-morphological pressures POLICY PAPER

**Focus on hydropower, navigation and flood defence
activities**

Recommendations for better policy integration

Status box

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The Water Directors endorsed this Policy Paper on WFD and Hydromorphology during their meeting on 30 November – 1 December 2006. This version will however be subject to final editing and lay out improvements in 2007.

**Disclaimer:**

This document has been developed through a collaborative programme involving the European Commission, all the Member States, the Accession Countries, Norway and other stakeholders and Non-Governmental Organisations. The document should be regarded as presenting an informal consensus position agreed by all partners. However, the document does not necessarily represent the official, formal position of any of the partners. Hence, the views expressed in the document do not necessarily represent the views of the European Commission.

CONTENTS

Contents.....	3
Policy Summary	4
1. Introduction	6
2. Interactions between the different policies.....	7
2.1. WFD- General overview	7
2.2. Renewable Energy Sources policy- General overview	10
2.3. Inland Waterway and Maritime Transport in the EU – General overview	12
2.4. Flood management policy- General overview	13
2.5. Other relevant EU policies	15
2.6. Potential interactions between the different policies.....	17
3. General recommendations	19
3.1. Recommendations for policy definition at the EC and MS levels	19
3.2. Recommendations for the planning and programming level	21
3.3. Recommendations for the project level.....	21
3.4. Cross-cutting recommendations for planning and project levels	22
4. Specific recommendations	23
4.1. Specific recommendations for hydropower	23
4.2. Specific recommendations for navigation and ports	23
4.3. Specific recommendations for flood protection	24
4.4. Specific recommendations for river basin management plans.....	25
5. Conclusions	29
ANNEX I: List of examples.....	30
ANNEX 2: List of boxes	43
ANNEX 3: Composition of Drafting group.....	44

POLICY SUMMARY

1. There exists in rivers and coastal waters a range of uses and interests that are frequently overlapping or competing. The Water Framework Directive (WFD) risk assessments, carried out in 2005, showed that hydromorphological pressures and impacts are one of the most important risks of failing to achieve WFD objectives. Three main hydromorphological driving forces identified in the risk analyses will be taken into account in this Policy Integration Paper: hydropower, navigation and flood protection. At a later stage, other driving forces, such as urbanisation, water supply, fisheries or recreation, may be addressed. Hydromorphological pressures from agriculture will be dealt with in the strategic steering group "WFD & Agriculture".
2. Several EU policies exist regarding these three hydromorphological driving forces, with a risk of conflict between these different policies and the WFD. Although the WFD is clear on the environmental objectives and actions; these being prevention, restoration and mitigation, in dealing with hydromorphology pressures on the water environment, promoting further integration between the different policy areas is needed at different levels and scales.
3. At policy development level one major path of progress to ensure a better integration between the different policies is an increase in transparency in decision making. This means not only transparency in data and procedures, but also in economic considerations. Moreover, market based instruments supporting the achievement of the environmental objectives should be further developed.
Regarding economic considerations, better incorporation of costs and benefits is needed. Electricity generation, navigation and flood protection entail important external costs (e.g. pollution, physical alteration, habitat degradation) and benefits. The instruments provided in WFD article 9 (for an adequate contribution of the different water uses to the recovery of the costs of water services) may also help for this incorporation of the external costs and benefits. Annex B3 (water uses and water services) of the WATECO guidance helps to understand the definition of "water services" and "water uses" and recommends a practical approach for assessing cost-recovery.
4. At planning and programming level decisions will be made for geographical areas or whole sectors. Coordination and/or integration between different sectoral plans at this level are crucial for better integration of hydromorphology issues and the WFD. This can be achieved by proper application of the "SEA-directive", early development of common visions for certain areas and involving all concerned authorities and stakeholders.
5. Recommendations on project level are focused on the assessment of the impacts and the needed mitigation measures. Technical solutions that do not cause deterioration of status should be promoted and for already deteriorated aquatic ecosystems, "win-win" situations can be achieved if new projects are also designed to improve the ecosystems concerned. Moreover, proper application of the "EIA directive" and, if appropriate, WFD Article 4(7) are important at this level.

6. At policy, planning and project levels, dialogues and co-operation processes between the different competent authorities and organisations, experts and stakeholders contribute to better policy integration in the field of hydromorphology. This integration should take place with regard to the three WFD stages of prevention, restoration and mitigation.
7. Development of clear guidance on authorisation procedures for hydropower in relation to the WFD is recommended. In order to minimize the need for new sites, the development of hydropower capacities could be supported first by the modernisation and the upgrading of existing infrastructures. Pre-planning mechanisms, in which regions and municipalities allocate suitable and "no-go" areas for the development of hydropower is also recommended.
8. For inland navigation and ports, the PIANC guidelines suggest an integrated approach for inland and maritime water transport design. For developments on the coast and estuaries (e.g. ports, flood defences, marinas etc) specific attention should be paid to the dynamic nature of the environment in achieving ecological objectives established by the WFD and/or for water dependent Natura 2000 sites, achieving "favourable conservation status". This requires close coordination with the implementation of the Birds and Habitats Directives
9. Concerning flood-risk management, the approach of making space for rivers is promising. This strategy needs to be supported by land-use planning policies and can be combined with agricultural and forestry activities. Similar initiatives may also be appropriate in coastal areas.
10. The WFD is an ambitious piece of legislation requiring reconsideration in the way certain users operate. However, WFD mechanisms for setting environmental objectives in the River Basin Management Plans provide also flexibility. This flexibility should be used on the right scale, which is in some cases the (international) river basin scale. Furthermore, the river basin management plans could also identify obsolete infrastructures or disconnections of the flood plain from the river, which can be respectively removed or restored. When the use of appropriate technical solutions and mitigation measures are not sufficient to avoid status deterioration, the "no net loss" principle could be applied as a supplementary measure. Sediment transport management approaches could also be progressively introduced in the (sub) basin management plans.
11. Practical examples have shown that positive experiences on integration already exist.

1. INTRODUCTION

The Water Framework Directive (Directive 2000/60/EC) of the European Parliament and the Council established a framework for European Community action in the field of water policy. The Directive sets a framework for the protection of all waters with the one main goal of reaching a “good status” of all Community waters by 2015. The risk assessments carried out by the Member States in 2005 (article 5 reports) in each river basin district have shown that hydro-morphological pressures and impacts are one of the most important risks of failing to achieve WFD objectives. The main hydro-morphological driving forces identified in the risk analyses are hydropower, navigation, flood protection and agriculture¹. They will be addressed in this paper. At a later stage other driving forces, such as urbanisation, water supply, fisheries or recreation, may be addressed.

To secure energy supply and to tackle climate change, the European Union has developed a policy of renewable energy sources. The most recent EU policy paper promoting renewable energy sources is the newly adopted Green Paper on “A European Strategy for Sustainable, Competitive and Secure Energy”, COM(2006) 105. This paper proposes a new Road Map for renewable energy sources in the EU, with possible targets beyond 2010, in order to provide a stable investment climate to generate more competitive renewable energy sources in Europe. The Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal market (hereafter the RES-E Directive) requires Member States to set national indicative targets totalling a 21% share of renewable electricity in total electricity consumption in the EU by 2010. As large differences exist between Member States with regard to current penetration and future potentials for electricity from different renewable energy sources, it is up to the Member States to choose the renewable energy sources necessary to achieve their national indicative targets. Hydropower currently dominates the renewable energy sources.

Modal shift to inland and maritime navigation is fostered by EU policy and may deliver many advantages in terms of combating climate change and congestion, and less maintenance and use of infrastructure, accidents, noise and other relevant elements compared to road- and rail transport. New developments of inland waterways are therefore likely to happen with the support of the EU TEN-T schemes. In January 2006 a Communication from the Commission on the promotion of inland waterway transport (“Naiades”) was adopted for the period 2006–2013. It proposes *inter alia* that a European Development Plan for improvement and maintenance of waterway infrastructures and transshipment facilities should be initiated to make trans-European waterway transport more efficient while respecting environmental requirements.

In the context of climate change and of recent severe flood events, flood-risk management has been raised as an important issue for human safety, competitiveness and attractiveness, sustainable development and ecosystem protection of the different territories. A communication on flood risk management was adopted in 2004 and in January 2006 the European Commission proposed a directive on the assessment and management of floods

¹ The pressures of agriculture on hydro-morphological conditions, especially from water abstraction and land drainage, will be tackled by the strategic steering group “WFD and Agriculture” when developing its work programme.

(COM(2006)15 final of 18.1.2006), which is currently under negotiation in Council and Parliament.

In summary, current and future uses of waters covered by the Water Framework Directive interact, resulting in potential synergies and antagonisms between different policies that have their own legitimacy. While the WFD provides for the harmonisation at EU level of environmental protection, energy, transport infrastructure and flood protection policies remain more national determined policies within an EU framework.

Thus, the Water Directors, who are the representatives of the EU Member States administrations with overall responsibility on water policy, agreed in November 2005 to take action in the context of the WFD Common Implementation Strategy. To this aim, they established an EU Strategic Steering Group (SSG) to address this issue of better integration of policies. The aim of the group's work is to put forward suggestions on how best to manage synergisms and antagonisms between the management of hydro-morphological alterations in river basin management planning and the requirement of other policies, focusing on hydropower (renewable energy), navigation and flood management. To do so, the group used two approaches: a technical approach, targeted to the identification of potentially relevant experience and good practice measures, and a political approach targeted to policy recommendations for a better integration between the different policies.

This paper puts forward policy recommendations for better integration. This integration is already applied in various places in Europe and examples are included in this paper. Relevant users of this paper could be the authorities in charge of the river basin management planning, hydropower schemes, navigation and flood-risk management, and related stakeholders and NGO's.

2. INTERACTIONS BETWEEN THE DIFFERENT POLICIES

2.1. WFD- General overview

The overall aim of the Water Framework Directive 2000/60/EC is to establish a legal framework within which to protect surface waters and groundwaters using a common management approach and following common objectives, principles, and basic measures. The WFD will rationalise and update existing water legislation and introduce an integrated and co-ordinated approach to water management in Europe based on the concept of river basin management plans.

The major purposes of the Directive are (see WFD Article 1):

- To prevent further deterioration and protect and enhance the status of aquatic ecosystems and associated wetlands;
- To promote the sustainable consumption of water; to reduce pollution of waters from priority substances;
- To prevent the deterioration in the status and to progressively reduce pollution of groundwaters; and
- To contribute to mitigating the effects of floods and droughts.

Box 1: Background information on the Water Framework Directive

Some documents that are prepared in the context of the Common Implementation Strategy for the Water Framework Directive are of special relevance to hydromorphology. They are listed below and can be found on the public part of "WFD Circa", a specific information exchange platform which was set up for this process:

http://forum.europa.eu.int/Public/irc/env/wfd/library?l=/framework_directive&vm=detailed&sb=Title

- Economics and the Environment – The Implementation Challenge of the Water Framework Directive (WATECO-guidance document nr 1).
- Identification and Designation of Heavily Modified and Artificial Water Bodies, guidance document No 4
- Public participation in relation to the Water Framework Directive, guidance document nr 8.
- Environmental objectives under the Water Framework Directive: A policy summary and a background document identifying key issues and key messages on environmental objectives under the Water Framework have been endorsed by the Water Directors in June 2005. They are available under the 'other thematic information' part of WFD Circa.
- Communication on pricing policies for enhancing the sustainability of water resources (COM(200) 477). The communication is available under the 'legislative texts' part of WFD Circa.
- Article 4.7 (new modifications). For new modifications to the physical characteristics of a surface water body like those created by hydropower plants, future navigation projects or flood protection schemes WFD article 4§7 allows failure to achieve no deterioration when specific criteria and conditions are met. The endorsement by the Water Directors of a paper that provides guidance on the application of this article is foreseen for the end of 2006. It will then be made available on the public part of Circa.

The main environmental objectives² of the Directive are in particular to achieve **"good ecological and good chemical status"** for surface water bodies in general or good ecological potential for the specific case of heavily modified and artificial water bodies by 2015. There is also a general "no deterioration" provision to prevent deterioration in status. This will require the management of the quality, quantity and structure of aquatic environments. The Directive also requires the reduction and ultimate elimination of priority hazardous substances and the reduction of priority substances to below set quality standards.

“Good ecological status” is supported by quantitative (a sufficient amount of water) and qualitative aspects. Surface waters physical conditions, and the maintenance of hydrological and morphological dynamics regarding flows, habitats and ecological processes (hydro-

² Detailed information on all environmental objectives and the link to exemptions is available in the Environmental Objectives Paper, see box 1.

morphology), play a key role for supporting the “health” of aquatic ecosystems and associated wetlands.

The Directive applies to all inland surface waters, groundwaters and coastal waters (including some significant marine areas).

Public participation is also an important feature. Balancing the interests of various groups will be particularly relevant for the design of river basin management plans.

River basin management plans

Member States have identified river basin districts and have designated competent authorities. For international river basin districts, Member States shall ensure co-ordination between the different competent authorities, mostly using structures stemming from international agreements (like the International Commission for the Protection of the Danube River or the Rhine).

The first river basin management plans should be adopted by 2009 and implemented until 2012. They should be reviewed every six years.

The plans are an account of how the objectives set for the river basin are to be reached within the timescale required. The plans will include: the river basin’s characteristics, a review of the impact of human activity on the status of waters in the basin, estimation of the effect of existing legislation and the remaining “gaps” to meeting these objectives; and a set of measures designed to fill the gaps. The plans are statutory instruments for concerned administrations and affected users.

Socio-economical considerations

The integrated approach set by the Directive recognises socio-economical considerations.

Firstly, the Directive requires the selection of measures by means of cost-effectiveness analyses. This should ensure that the targets of the directive are met at the lowest possible costs.

Secondly, as mentioned above, good ecological and good chemical status is one of the main environmental objectives to be achieved by 2015. Different environmental objectives are given to particular categories of water bodies, the artificial (created by human activity) and the heavily modified ones (as a result of substantial physical alterations by human activity). For those categories, the environmental objectives are good chemical status and good ecological potential. For all categories exemptions are allowed in the form of extension of deadlines (from 2015 to 2027) or less stringent objectives. They need to be justified by technical (“infeasible”) or economical (“disproportionately expensive”) reasons and reported in the river basin management plans².

In that context, cost-benefit analyses are also particularly relevant to justify different environmental objectives.

Another important concept set by the Directive is the principle of “cost-recovery” of water services. Financial, resource and environmental costs must be adequately “recovered” from the different users of the water service by appropriate means, including the polluter pays principle.

2.2. Renewable Energy Sources policy- General overview

The key priorities for the European Union energy policy are to address the Union's growing dependence on energy imports from outside the Union, to tackle climate change as well as meet EUs overall and Member States individual targets to reduce CO₂ emissions. The promotion of renewable energy has an important role to play in these tasks.

Over the last decade, different EU policy papers have been adopted to enhance the development of renewable energy sources:

- The 1997 White Paper “Energy for the future”, COM (1997) 599, which has set a target of doubling the share of renewable energy in the primary energy consumption from 6% in 1997 to 12% in 2010.
- The Green Paper on the security of supply “Towards a European strategy for the security of energy supply”, COM (2000) 769.
- Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal market (RES-E directive).
- The Green Paper on “A European Strategy for Sustainable, Competitive and Secure Energy”, COM (2006) 105.

Box 2: Background information on the share of renewable energy in the EU

- 2004 Communication on the share of renewable energy in the EU - http://ec.europa.eu/comm/energy/res/legislation/country_profiles/com_2004_366_en.pdf
- Staff working document with country profiles (annex to the 2004 Communication on the share of renewable energy in the EU) - http://ec.europa.eu/comm/energy/res/legislation/country_profiles/2004_0547_sec_country_profiles_en.pdf
- Communication on support of electricity from renewable energy sources (COM(2005) 627). http://ec.europa.eu/comm/energy/res/biomass_action_plan/doc/2005_12_07_comm_biomass_electricity_en.pdf

The RES-E directive aims at a significant increase in the contribution of renewable energy sources to electricity production, including hydropower together with all other renewable energy sources³, and to create a basis for a more comprehensive framework for the development of electricity from renewable energy sources. The Directive does not make a distinction between the various renewable energy sources with regard to what is more or less favourable to develop, but leaves this choice to the Member States.

The directive sets an important target of 21% share of renewable electricity in total electricity consumption in the EU by 2010, by which Member States have set up their own national

³ Renewable energy sources, as defined in the Directive 2001/77/EC, shall mean renewable non-fossil energy sources (wind, solar, geothermal, wave, tidal, hydropower, biomass, landfill gas, sewage treatment plants, gas and biogases).

indicative targets. The directive gives a quantitative framework within which each Member State implements the most appropriate measures necessary to achieve their targets. In the context of this policy paper, it is also important to mention that the RES-E Directive requires Member States to simplify administrative procedures for developing renewable electricity

In the recently adopted Green Paper on a European Strategy for Sustainable, Competitive and Secure Energy (COM(2006)105) the Commission has suggested a series of measures to address the challenges of global warming. In particular, it proposes that the EU prepares a new Road Map for renewable energy sources in the EU, with possible targets beyond 2010, in order to provide a stable investment climate to generate more competitive renewable energy sources in Europe.

The newly adopted Communication on support of electricity from renewable energy sources (COM(2005) 627) recommends that clear guidelines for authorisation procedures, especially regarding the relationship with European environmental legislation, should be established in Member States. The Communication also recommends that Member States should establish pre-planning mechanisms in which regions and municipalities are required to assign locations for different renewable energies, and that lighter procedures should be created for small projects.

Development of hydropower

Hydropower dominates currently the RES-E generation in the EU25. As for future potential of renewable energy sources, recent analyses suggest that wind energy and biomass have a leading role. These two technologies can be expected to deliver most of the increase in electricity from renewable sources in the EU for 2010.

The baseline and the choice made by the different Member States to reach their national indicative targets on renewable electricity may vary considerably⁴. Thus, the importance of further development of hydropower is likely to be different in various Member States. Part of the potential for development may also come from the modernisation of existing hydropower facilities.

Large scale hydropower with storage reservoirs might still be an attractive option when seen in the context of all the synergies arising from multi-purpose uses of reservoirs (water supply, flood defence, irrigation, recreation). In a narrower sense, seen only as a source of electricity, the merits of large hydropower (meeting peak demand, providing ancillary services) should not be neglected.

However, hydropower has been identified as one of several drivers to hydromorphological alterations and it is therefore important that hydropower is carried out in an appropriate manner in order to avoid and minimize the potentially negative effects on water bodies.

Energy efficiency

Energy efficiency is considered as important as renewable energy in combating climate change and increasing security of supply. Energy efficiency measures make it easier to achieve the overall renewable energy and the renewable electricity targets for the EU by reducing the total volume of consumption against which the shares are calculated. The EU has

⁴ More information on the performance of the Member States in the frame of the RES-E Directive can be found on: http://ec.europa.eu/energy/res/legislation/electricity_member_states_en.htm

an active policy on energy efficiency and the European Parliament and the Council have newly adopted a directive on energy end-use efficiency and energy services (Directive 2006/32/EC), which includes a general energy end-use target of 9% for 9 years, covering the period from 2008 until 2017. This directive will also serve as an “umbrella” to complement and improve the implementation of existing EU energy efficiency legislation.

2.3. Inland Waterway and Maritime Transport in the EU – General overview

The European Commission's 2001 Transport White Paper and its mid-term review of 22 June 2006 set out a series of targets to ensure competitiveness and sustainable mobility by 2010. As a result of both the continuing growing overseas trade and EU enlargement towards Central and Eastern Europe, freight transport volumes in Europe are expected to increase by one third until 2015. Present patterns of transport growth and its reliance on road transport have become a synonym to congestion and pollution, the costs of which are expected to double to 1% of Europe's annual GDP by 2010. Together with rail, **maritime transport** and **inland waterway transport** can contribute to the sustainability of the transport system, as recommended by the White Paper.

Transport by **inland waterways** plays an important role for the carriage of goods in the EU. More than 35.000 km of waterways connect hundreds of cities and industrial regions. In the EU-15 Member States, more than 450 million tons, or around 130 billion ton-kilometres, are transported by inland waterway. Enlargement added some 6.25 billion tkm (5 %). Inland waterway transport contributes significantly to coping with the present traffic volumes in Europe and is able to cope with even more. While it accounts statistically for 6,5% of the total freight traffic in the EU-25, its modal share in some regions and along certain corridors is remarkably higher (e.g. 44 % in NL).

In the context of an entirely liberalised inland navigation market since 1 January 2000 the European Commission aims to promote and strengthen the competitive position of the inland waterway transport in the transport system, and to facilitate its integration into the intermodal logistic chain. The European Commission's **Communication “NAIADES” on the promotion of inland waterway transport** includes an Integrated Action Programme for the development of this transport mode. The Action Programme focuses on five strategic and equally important areas, namely on the creation of favourable conditions for services and new markets, on the modernisation of the fleet, in particular its environmental performance, on jobs and skills, and on the promotion of Inland Waterway Transport as a successful business partner. Part V of the Action Programme relates to the waterway infrastructure. It proposes *inter alia* that a European Development Plan for improvement and maintenance of waterway infrastructures and transshipment facilities should be initiated to make trans-European waterway transport more efficient while respecting environmental requirements. The Communication underlines that the development of waterway infrastructure should happen in a co-ordinated and integrated way, by fostering the mutual understanding of multi-purpose use of waterways and to reconcile environmental protection and sustainable mobility.

Considering its geography, its history and globalisation the European Union is still very dependent on the **maritime transport**. Nearly 90% of its external trade and more than 40% of its internal trade goes by sea; -almost 2 billion tons of freight are loaded and unloaded in EU ports each year and volumes are increasing, particularly in unitised cargoes (i.e. containers).

Maritime companies belonging to European Union nationals control nearly 40% of the world fleet; the majority of EU trade is carried on vessels controlled by EU interests.

The European Union's seaports are vital both to the competitiveness of its internal and international trade, and as links to its islands and outlying regions. Seaports in turn rely on efficient and effective connections to the hinterland, *inter alia* via inland waterways. To accommodate anticipated future growth in freight traffic without putting further pressure on Europe's already congested road network, waterborne transport will assume an ever more important role. The European Commission has an active policy to promote Short Sea Shipping to help meeting the objectives of the European Transport Policy.

Box 3: Background information on main legislative or policy instruments regarding the development of inland waterways and maritime transport at EU level

- White Paper 'European transport policy for 2010: time to decide' ([COM\(2001\) 370 final](#))
- Communication from the Commission to the Council and the European Parliament: Keep Europe moving- Sustainable mobility for our continent- Mid-term review of the European Commission's 2001 Transport White Paper (COM(2006) 314 final)
- The revised Community guidelines for the development of the trans-European transport network, [Decision 1692/96/EC](#) of the European Parliament and of the Council, as amended by [Decision 884/2004/EC of 29.4.2004](#).
- Communication from the Commission on the promotion of inland waterway transport ("Naiades"), [COM\(2006\) 6 final of 17.1.2006](#)
- Commission Communication on Short Sea Shipping ([COM\(2004\) 453 final of 2.7.2004](#))

Inland navigation on the most important waterways in the EU is also governed by international conventions:

- Central Commission for Navigation on the Rhine (CCNR), based on the 1868 revised Mannheim Convention for Navigation on the Rhine
- Danube Commission, based on the 1948 Belgrade Convention regarding Navigation on the Danube
- Moselle Commission, based on the 1956 Luxembourg Convention regarding Navigation on the Moselle

2.4. Flood management policy- General overview

Between 1998 and 2004, Europe suffered over 100 major damaging floods, including the catastrophic floods along the Danube and Elbe rivers in summer 2002. Severe floods in 2005 and 2006 further reinforced the need for concerted action. Since 1998 floods in Europe have caused some 700 deaths, the displacement of about half a million people and at least €25 billion in insured economic losses.

The over all aim of EU flood policy is the reduction of risk to human health, the environment and economic activity associated with floods in the Community.

Over the last years, two EU policy papers have been adopted on flood management policy at EU level⁵:

- A communication on flood risk management COM(2004)472 final in which the Commission suggested a number of actions that would lead to concerted action across the EU to reduce flood risks.
- A proposed directive on the assessment and management of floods, COM(2006)15 final of 18.1.2006

Following consultations on the 2004 Communication with the EU institutions the following three main components of an action programme on flood risk management were agreed:

1. Exchange of information on flood risk management in the EU, including on flood related research and on specific topics, for instance flood forecasting and flood-mapping.
2. A targeted approach to the best use of EU funding tools for the different aspects of flood risk management, for example the European Union Solidarity Fund.
3. Development of a legislative instrument on flood risk management.

The third topic resulted in the adoption of a Commission proposal for a Directive of the European Parliament and of the Council on the assessment and management of floods.

The following section outlines the main proposed requirements of that Directive. These requirements may therefore be subject to change during the process of negotiation of the text between Council and Parliament.

The proposed Directive covers all rivers, lakes and coastal areas of the Community, it emphasises the first three stages of flood risk management: prevention, protection and preparedness.

The proposed requirements of the Directive are that Member States shall undertake:

1. **Preliminary flood risk assessment:** to establish areas where potential significant flood risks exist or are reasonably foreseeable in the future.
2. **Flood risk maps:** flood risks would be mapped for the river basins and sub-basins with significant potential risk of flooding, in order to increase public awareness; support the process of prioritising, justifying and targeting investments and developing sustainable policies and strategies; and to support flood risk management plans, spatial planning and emergency plans.
3. **Flood risk management plans:** flood risk management plans would then need to be developed and implemented at river basin/sub-basin level to reduce and manage the flood risk. These plans would include the analysis and assessment of flood risk, the

⁵ available on http://europa.eu.int/comm/environment/water/flood_risk/index.htm

definition of the level of protection, and identification and implementation of sustainable measures applying the principle of solidarity: not passing on problems to upstream or downstream regions and preferably contributing to reduction of flood risks in upstream and downstream regions.

To take account of the diversity in flood events and impacts throughout Europe, detailed Community wide objectives and deadlines for managing flood risks and specific accompanying measures would *not* be prescribed in a legal instrument, but would be left to the Member States.

Although flood protection measures are identified as one of the drivers for hydromorphological alterations, there are important actual or potential links between the purposes and methods of flood risk management and the achievement of water quality objectives under the Water Framework Directive. The proposed Directive therefore includes a number of links to ensure coordination in the two implementation processes. This is important to ensure there is no overlap of procedures and moreover, that the timetables for implementation are such that maximum synergy can be achieved.

In first reading the following key modifications were proposed by both the Council and the European Parliament:

- conditions for the use of existing instruments (assessments, maps, plans);
- strengthening requirements on international cooperation in shared river basins;
- further specifying the possibility to use other administrative arrangements than those set out in the Water Framework Directive.

The following key issues are likely to be discussed in second reading as views differed between the Council and European parliament:

- strengthening or streamlining the preliminary flood risk assessment and flood mapping requirements;
- the attention given to climate change;
- the extent of coordination with the Water Framework Directive
- and the attention given to sustainable flood risk management and economic aspects, such as attention to non-structural measures and measures with mutual benefit for flood protection and environmental protection, and cost-recovery as proposed by the European Parliament.

2.5. Other relevant EU policies

Besides the policies on the main hydromorphological driving forces, some other EU policies exist that have a potentially important interface with the WFD and must therefore be taken into account when considering effective policy integration. This list only mentions the policies that have the most obvious overlaps, and it does not pretend to be exhaustive.

- The 1979 **Birds Directive** (79/409/EEC) identified 181 endangered species and subspecies for which the Member States are required to designate Special Protection Areas (SPAs). See http://ec.europa.eu/comm/environment/nature_biodiversity/index_en.htm
- The 1992 **Habitats Directive** (92/43/EEC) aims to protect wildlife species and their habitats. Each Member State is required to identify sites of European importance and to put in place a special management plan to protect them, combining long-term preservation with economic and social activities, as part of a sustainable development strategy. These sites, together with those of the Birds Directive, make up the Natura 2000 network - the cornerstone of EU nature protection policy. See http://ec.europa.eu/comm/environment/nature_biodiversity/index_en.htm
- The "**SEA-directive**", Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment (strategic environmental assessment")

The purpose of the SEA ("strategic environmental assessment") Directive is to ensure that environmental consequences of certain plans and programmes are identified and assessed during their preparation and before their adoption. The public and all authorities concerned can give their opinion and all results are integrated and taken into account in the course of the planning procedure. SEA will contribute to more transparent planning by involving the public and integrating environmental considerations.

Further details on the Directive, on the Commission's guidance on the implementation of Directive 2001/42/EC and on the EIA-directive (see below) are available on <http://ec.europa.eu/comm/environment/eia/home.htm>

- The "**EIA directive**", Directive 85/337/EEC (environmental impact assessment) ensures that environmental consequences of projects are identified and assessed before authorisation is given. The EIA Directive outlines which project categories shall be made subject to an EIA, which procedure shall be followed and the content of the assessment.
- The **European Marine Strategy**, consisting of a Thematic Strategy on the Protection and Conservation of the Marine Environment COM(2005) 504 final and a Marine Strategy Directive COM(2005)505 final (see <http://ec.europa.eu/comm/environment/water/marine.htm>)
The thematic strategy aims to achieve good environmental status of the EU's marine waters by 2021 and to protect the resource base upon which marine-related economic and social activities depend. The marine strategy will constitute the environmental pillar of the future EU maritime policy the European Commission is working on (see Green Paper COM(2006) 275 final 'Towards a future Maritime Policy for the Union: A European vision for the oceans and seas' on <http://ec.europa.eu/maritimeaffairs>) , designed to achieve the full economic potential of oceans and seas in harmony with the marine environment. When considering the marine environment, the Commission's Communication and the Recommendation from Parliament and Council on integrated coastal zone management should be taken into account (<http://ec.europa.eu/environment/iczm/home.htm>).

- **The Common Agriculture Policy (CAP).** Depending on the choice made by the MS, Rural Development Programmes may also include opportunities to fund measures related to flood prevention and flood protection in rural areas. In particular, changes in land use that could be required by the "space for river" strategy (see paragraph 4.3) may be supported. For more information on rural development and water policy, see: http://forum.europa.eu.int/Public/irc/env/wfd/library?l=/framework_directive/thematic_documents/wfd_agriculture&vm=detailed&sb=Title. Other provisions of the reformed CAP will also enhance the water retention capacity of soils: the maintenance of land in good agricultural and environmental conditions (focusing on soil-related issues) and the requirement to maintain permanent pastures.
- **Cohesion policy.** The next generation of **structural and cohesion funds** are being reshaped for the period 2007-13. The regulations are under negotiation. They will be accompanied by EU strategic guidelines aimed at highlighting the priorities of use of those funds. See http://ec.europa.eu/comm/regional_policy/index_en.htm
At the Member States level, national strategies in line with the EU strategic guidelines should be designed. Then, the competent authorities will have to draw operational programmes to start the programming period by the 1st January 2007.

Wide opportunities can be found to support water policy. However, one must also recognise that risks of funding projects with negative effects on water resources also exist. Thus, a clear attention should be given to the operational programmes falling under the requirements of the SEA directive.

2.6. Potential interactions between the different policies

At a first glance, there might be a risk of conflict between the implementation of different policies:

- The WFD puts a strong emphasis on the quality of hydro-morphological conditions as they support the type specific aquatic communities that constitute good ecological status.
- The past developments of hydropower generation, navigation infrastructures and activities, and flood defence facilities have often required major hydro-morphological changes.

However:

- Whilst impacting on aquatic ecosystems, such activities can also deliver important environmental benefits in other areas (e.g. reducing the impacts of climate change) or benefits to human safety and/or generate or secure employments.
- Many damaging consequences on aquatic ecosystems are caused when those responsible for undertaking/regulating such activities either do not recognise or take insufficient account of environmental protection as part of the multi-purpose uses of water bodies.

In other words, different policies do not always have to automatically conflict and there is room for significant progress in policy integration by enhancing the recognition of the

different interests, fostering the co-operation between the different competent authorities and stakeholders, and promoting more integrated development strategies. This will require efforts and acceptance from all parties involved:

When required, infrastructures owners, users or developers will have to mitigate the impacts of existing and new equipments and activities; they will not only have to investigate and apply good practice but may also need to develop alternatives to the traditional solutions in order to avoid deterioration. In certain cases, they will have to accept the modification of activities and/or infrastructure in order to restore ecological continuity and aquatic ecosystems. Achieving a good balance between protection and uses will also require where possible modifications of the infrastructures for the restoration of the aquatic ecosystems. Indeed, single mitigation measures at the scale of individual infrastructure might be insufficient in certain situations to maintain an overall ecological quality.

Box 4: WFD stepwise approach for past and new developments: prevention, restoration, mitigation

The WFD approach for dealing with hydromorphology pressures on the water environment is as follows (see WFD Art. 4(3)-4(7)). For new developments, there is a need firstly to prevent deterioration of 'status' in a water body. Where this is not possible, mitigation measures should be applied (see also the document mentioned in box 1, Article 4.7 (new modifications). Where a physical modification has already taken place, actions should first be considered to restore the water body with the aim to achieve 'good ecological status' (restoration). Where restoration is not possible, mitigation measures should be investigated with the aim to meet 'good ecological potential' (GEP) (see also the document mentioned in box 1, Identification and Designation of Heavily Modified and Artificial Water Bodies.)

In addition to the policy interactions, promoting further integration of the different policy areas will require an investigation of what can be done at the different levels and scales: overall policy definition, plans and programmes, individual design of the project. These will be addressed in the subsequent sections.

3. GENERAL RECOMMENDATIONS

At policy, planning and project levels, dialogues and co-operation processes between the different competent authorities, experts and stakeholders can contribute to better policy integration in the field of hydromorphology. This integration should take account of the three WFD stages of prevention, restoration and mitigation.

3.1. Recommendations for policy definition at the EC and MS levels

The WFD sets ambitious environmental objectives for the water environment, which are likely to affect water users. However, it provides Member States with the flexibility to set different objectives for particular water bodies that reflect environmental, social and economic needs and priorities. This **flexibility** means the needs and priorities of other policy areas can be taken into account in water management decisions, through the appropriate use of exemption mechanisms, subject to the application of the exemption tests. At the same time, other policies must also take into account environmental objectives in order to increase synergies and reduce antagonisms.

One major path of progress to ensure a better integration between the different policies is an increase in **transparency and public involvement** in decision making (see CIS WFD Guidance Nr.8, public participation in relation to the WFD). Consequently, decisions should be taken on the basis of transparent environmental, social and economic data and clear procedures. Moreover, transparency of economic considerations should be enhanced and market based instruments that support the achievement of the environmental objectives should be further developed.

Regarding economic considerations, **incorporation of the external costs and benefits** is needed. These costs and benefits can for example consist of pressures on humans and the environment (e.g. via pollution, physical alteration, habitat degradation) or of social cohesion issues, both of which are associated with various forms of electricity generation or modes of transport.

Better incorporation of the costs and the benefits will:

- Improve the cost-benefit analyses that will help deciding the best alternatives and/or options for new projects, or justifying the exemptions from the WFD environmental objectives,
- Fund aquatic ecosystems restoration actions where possible.
- Fund the needed mitigation measures for existing infrastructures,

Box 5: Comparison of the average external marginal costs between the different transport modes

When comparing the external marginal costs between the different transport modes, the following elements are currently taken into account (Source European Commission, DG TREN):

- Accidents
- Noise
- Pollutants
- Climate effect
- Maintenance and use of infrastructure
- Traffic jam

Though important environmental elements already appear, **the costs of the different transport modes on water resources and aquatic ecosystems are not taken into account specifically in this comparison.**

Some **market based instruments** are provided by the WFD. These are the economic assessment of water uses and cost-recovery of services, as well as the requirement to establish water pricing policies that implement the polluter pays principle and support sustainable and efficient water use. These instruments can foster win-win solutions, for example by removing environmentally harmful subsidies or by providing economic incentives to increase efficiency of water use.

Thus, a proper economical analysis under WFD article 9 is of key importance for this purpose. Annex B3 of the WATECO guidance helps to understand the definition of water services and water uses and recommends a practical approach for assessing cost-recovery.

Examples of economic instruments could be levies, feed in tariffs, green certificates or eco-labels for services at a higher cost.

The following examples are available in Annex I:

[1. Feed-in tariffs in Germany](#)

[2. Eco-labelling](#)

[3. Wide approach to water services and water uses for cost recovery analysis in the Seine-Normandie District](#)

Yet, it is recognised that the methodologies for assessing the different environmental costs and benefits need to be improved, in particular in the field of aquatic ecosystems. Further research should be carried out in that field⁶.

⁶ This was also recommended by the Water Directors in their background document on WFD key issues and research needs:

http://forum.europa.eu.int/Public/irc/env/wfd/library?l=/framework_directive/thematic_documents/relevant_research&vm=detailed&sb=Title

An example of a research project developing and testing practical guidelines for the assessment of environmental and resource costs and benefits in the WFD is Aquamoney, see: www.aquamoney.org

See also the EU supported research project ExternE on cost-benefit assessment methodologies. However, the aquatic environment was not taken into account in this project: see

<http://ec.europa.eu/research/press/2001/pr2007en.html>

In addition, progress in the incorporation of the environmental costs and benefits should be accompanied by the development of tools for the assessment of the biological impacts of infrastructures.

Key planning and programming documents can be another way to promote a better integration, or at least to ensure a minimum level of consistency between the implementation of the different policies. This will be elaborated in the next paragraph.

3.2. Recommendations for the planning and programming level

Planning and programming documents for a whole sector or a geographical area set decisions for the projects sites or conditions under which projects can be developed. Further continuation of **co-ordination and/or integration between the different sectoral plans** is crucial to reduce inconsistencies and to allow synergies, thus achieving a territorial consistency.

Each policy has its own planning procedures (master plans for navigation, river basin management plans for water, flood-risk management plans, land-use plans, master plans on energy,...), with different planning cycles and different geographical scopes. Thus, integration is likely to be a gradual process with progressive improvements when the different plans are reviewed.

When applicable, the “**SEA directive**” (2001/42/EC) can help co-ordination and integration between the different policies in assessing the environmental consequences of plans and programmes and in producing an environmental report including consideration of reasonable alternatives.

Integration can be considerably facilitated by the **early development of common visions** on a given territory, weighing the different issues and interests. Good examples of such approaches exist for the development of ports or flood-risk management in certain estuaries (Scheldt, Seine and Thames).

The following example is available in Annex I:

[4. The Scheldt estuary in 2010](#)

In the international context, river protection and navigation commissions are well suited to support policy integration on the planning and programming level. In general, the international river protection commissions coordinate the development of river basin management plans and the international navigation commissions coordinate issues related to the navigation in the basin, in particular in the Danube and the Rhine. If these commissions do not exist, another platform should be used to support policy integration at river basin scale, as well as on national and regional scales.

3.3. Recommendations for the project level

In general, alternative options for a certain project are considered at planning and programming level. This means in general, less choice in alternatives exists on project level. Therefore, the recommendations at project level are focused on the assessment of the impacts and the needed mitigation measures.

Where possible, **technical solutions that do not cause deterioration of status** should be promoted (e.g. setting flood embankments back from the edge of the river to make more space for the river to flood). Examples of good practices can be found in the Technical Report on WFD and Hydromorphology.

For already deteriorated aquatic ecosystems, there could be opportunities for **“win-win” situations** if the development of new projects is also designed to improve water quality and to create, protect or restore aquatic habitats.

When applicable, the **“EIA directive”** (85/337/EEC, environmental impact assessment) ensures that environmental consequences of projects are identified, taking into account the WFD related inputs, and assessed before authorisation is given.

New projects may also fall under the provisions of WFD article 4.7 (see box1 for more information on this article).

3.4. Cross-cutting recommendations for planning and project levels

Enhancement of **interdisciplinary dialogue and co-operation processes** between the different competent authorities, experts and stakeholders will be crucial in order to ensure all the interests are taken into account and that the right balance is found between the different uses and the protection of water resources.

This enhanced co-operation can also facilitate the selection, the design and the acceptance of the most cost-effective measures and options to reconcile the different water uses, including aquatic ecosystems protection.

The following examples are available in Annex I:

[5. Added-value of public participation and interdisciplinary dialogue in the French Adour-Garonne Water Agency](#)

[6. Stakeholder engagement in maintenance dredging decision-making in the UK](#)

This enhanced dialogue and co-operation concerns not only the level of public participation, but also between administrations on all levels.

A first step in bringing these recommendations further would be to get for Member States more insight in their choices for hydropower, navigation or flood defence developments.

Policy integration needs to occur at all three stages of prevention, restoration and mitigation. In particular, the design of programmes and projects must consider the possible alternatives and the use of best available techniques. This can be done by using **spatial planning policies** or the SEA Directive and EIA Directive to prevent/minimise any conflict between policies in the first place.

Moreover, with **funding mechanisms** such as those under the CAP and EU cohesion policies wide opportunities can be found to support water policy. These mechanisms could be aligned so as to reduce hydromorphological pressures and allow waters to reach either GES or GEP.

4. SPECIFIC RECOMMENDATIONS

4.1. Specific recommendations for hydropower

Clear guidelines for authorisation procedures, especially regarding guidance on the relationship with the WFD, should be established in Member States as recommended in the Commission Communication on support of electricity from renewable energy sources (COM(2005) 627). This Communication also recommends that Member States should establish pre-planning mechanisms in which regions and municipalities are required to assign locations for different renewable energies, and to create lighter administrative procedures for small renewable projects.

Multiple legislation should not create barriers and extra work for applicants and authorities concerned. However, the administrative burden can also be reduced by the project applicant in presenting a project which already factors in the various considerations, e.g. using best available techniques to reduce environmental impact.

The following example is available in Annex I:

[7. Guidelines for authorisation procedures in Germany](#)

In order to minimize the need for new sites, **the development of hydropower capacities could be supported by the modernisation and the upgrading of existing infrastructures**. Equal attention should be given to all forms (modernisation, upgrade and new site developments) with regard to the area designation below.

This development should be accompanied by an improvement of water ecology, through clear ecological standards for new facilities, or for existing facilities through their modernisation as well as the improvement of operation conditions. New hydropower plants should for example all have fish passages and they should respect a minimum ecological flow.

As recommended in the Communication on support of electricity from renewable energy sources (COM(2005) 627), **pre-planning mechanisms** allocating suitable areas for new hydro-power projects should be developed on appropriate water stretches. Practical examples could be allocating suitable areas for hydropower development with the identification of sites where new plants would be both acceptable in terms of water protection and economically beneficial. In that frame, some of the remaining unregulated rivers in areas of high values could be designated as “no-go” areas for hydropower schemes. This designation should be based on a dialogue between the different competent authorities, stakeholders and NGOs. In the pre-planned areas, the permitting process could be reduced and implemented faster, provided WFD article 4.7 is respected (see footnote 7).

The following example is available in Annex I:

[8. Protection plans and master plans in Norway as a part of the River Basin Management Plan \(RBMP\) under the WFD](#)

4.2. Specific recommendations for navigation and ports

The **PIANC guidelines for sustainable inland waterways and navigation** (2003, www.pianc.org/download03) suggest an integrated approach for inland water transport design

that is relevant with WFD implementation. Those guidelines offer important ideas for policy integration and are recommended for use.

An extract of these guidelines, as well as information on a password for downloading the guidelines, is available in Annex I:

[9. Extract of the PIANC guidelines](#)

The Commission Communication on the promotion of inland waterway transport recommends also that “**the development of waterway infrastructure should happen in a co-ordinated and integrated way**, by fostering the mutual understanding of multi-purpose use of waterways and to reconcile environmental protection and sustainable mobility. Infrastructure charging may contribute to funding opportunities.”

Co-ordinating the development of inland navigation strategies with the river basin management plans would be logical and would provide the necessary basis for addressing conflicts between the two policies. On transboundary level, international commissions for navigation and for river protection (e.g. for the Rhine and Danube) should use their mandate and actively support this integration. In the same way, co-ordinating the river basin management plans with the international conventions regulating marine-related activities is needed.

These specific recommendations are also relevant for the development of navigation for recreational uses. Sea ports are often located in sensitive and dynamic natural environments. The development of sea ports, as well as other important pressures like flood defences, can lead to the deterioration of aquatic habitats, especially those in estuaries. In order to be able to reconcile seaport development and the protection of these habitats, an integrated approach should be considered, i.e. an approach that recognises the dynamic nature of these environments, subject to hydrological and geomorphological processes and that emphasises the need to conserve structure and functions of the habitat. This would recognise that within such systems changes in habitat localisation may occur. In designated estuaries, such an approach requires also a co-ordinated implementation of the Birds, Habitats and Water Framework Directives.

The following examples are available in Annex I:

[10. Integrated ports development approach, the New! Delta project](#)

[11. Immingham Outer Harbour development](#)

4.3. Specific recommendations for flood protection

Flood-risk management is probably the policy with the best potentialities for synergies with other aspects of water management, provided that adequate strategies are implemented.

In some cases, traditional engineering solutions (dams, channelisation or dykes) have not delivered the expected results. The occurrence of floods can not be reduced completely and the consequences of future floods are likely to have an increasing social and economic impact. Moreover, the prioritisation for locating flood defences to protect particular sites or land uses is being reviewed. Thus, another approach of flood-risk management is now promoted: an integrated flood risk management focusing on prevention, protection and preparedness (including forecasting). In this framework, , **making space for river and coastal flooding** in

the areas where the human and economic stakes are relatively low, represents a more sustainable way of dealing with floods. The conservation and the restoration of the natural functions of wetlands and floodplains, with their ability to retain floodwaters and reduce the flood pulse, are a key feature of this strategy, thus allowing important opportunities for synergies with WFD implementation.

The following examples are available in Annex I:

[12. 'Space for river' in the Loire/Allier](#)

[13. Room for the River in the Rhine Delta](#)

[14. Making Space for Water in England](#)

This strategy needs to be supported by:

- **Close co-ordinations with land-use planning policies** restricting developments on flood-plains and designating areas for flood water storage, thus maintaining enough space for flood expansion and decreasing the need for local flood defence infrastructures,
- **Conservation and/or return of agricultural or forestry activities that are compatible with an increased retention time of water at certain periods of the year.** Rural Development Programmes can support such activities.

The following examples are available in Annex I:

[15. Flood plain restoration: Tisza](#)

[16. Coastal Flood Plain Restoration – Frieston Shore, The Wash, England](#)

Effective flood risk management has also to take account of the river basin scale and long-term trends (e.g. in climate). Thus, there are obvious advantages of making use of the national and international river basin planning systems being set up under the WFD.

4.4. Specific recommendations for river basin management plans

The flexibility, provided by the WFD to take into account the water uses, must be used in the frame of an overall ecologically coherent strategy, in order to deliver accountable results on water bodies' status. Thus, territorial priorities for objectives and actions will have to be set in the river basin management plans, taking into account the ecological status, the available budgets and the different water uses. Attention should be paid not only to existing uses or future developments but also to the restoration of the damage caused by past activities.

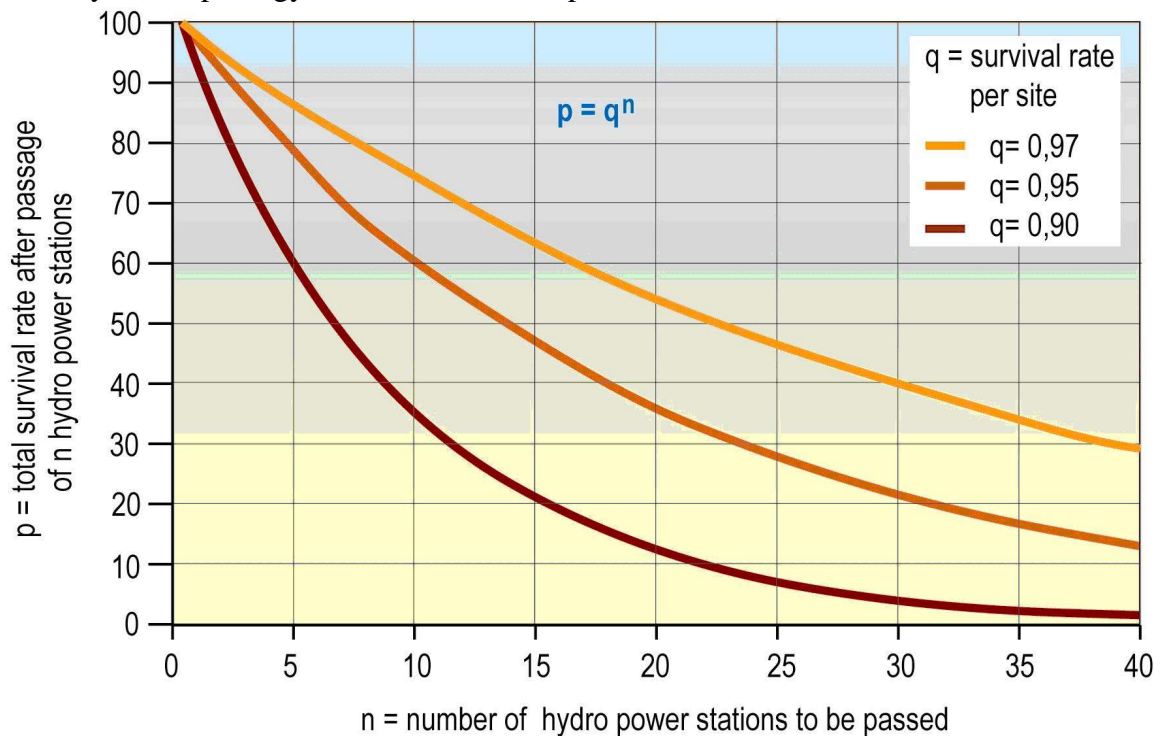
The establishment of those priorities should proceed from an integrated approach. For example, it will generally be more appropriate to restore river continuity on a catchment or sub-catchment level (not only on the level of single water bodies or sites). However, each basin/catchment also needs to evaluate its specific situation related to natural fish populations and their migration habits. Measures have to be based on these individual considerations and not only, for example, on fish species which migrate long distances (e.g. Salmon, Sturgeon).

The following example is available in Annex I:

[17. Restoration of Salmon in the Rhine](#)

Box 6: Total survival rate of long-distance migratory fishes at a chain of hydropower stations

When evaluating longitudinal river continuity, special attention should be given to the decreasing survival rate in case of chains of hydropower stations. The figure below illustrates clearly that migration assessments should be carried out on a river basin or sub-basin scale and not per individual facility, see also <http://www.ecologic-events.de/hydromorphology/documents/dumont.pdf>



A river basin approach is also called for in respect to inland navigation. Inland navigation transport in Europe often crosses national boundaries making it a truly international surface transport. Measures taken on a local level can impact inland navigation on an international level. Therefore, river protection commissions should early on involve the respective navigation commissions when coordinating the development of river basin management plans in order to successfully achieve policy integration in respect to water protection and inland navigation at river basin scale.

Supplementary measures for infrastructures

The renewal or review of river infrastructures can also be an opportunity to improve the way they are operated and to modernise them for a better water management. The river basin management plans could set general principles and conditions for those reviews.

Furthermore, the river basin management plans could also identify **obsolete infrastructures** that are no longer justified under a cost-benefit analysis and set the conditions under which the competent authorities might decommission them. Whilst the **removal** of such infrastructures, like obsolete dams, can be an active and viable solution to restore aquatic ecosystems, a proper assessment of the effects of removal is needed. The removal of obsolete infrastructures can also cause environment problems and the continuing use of existing ancient dams can provide renewable energy without an additional environmental impact.

Similar considerations apply when assessing other restoration options, for example reconnecting floodplains and meanders, which are historically disconnected from the river.

The following example is available in Annex I:

[18. Dam removal on the Mirna River, Slovenia](#)

River basin management plans could also set conditions for new infrastructure to preserve ecological status. For example, if the use of appropriate technical solutions and mitigation measures are not sufficient to avoid status deterioration, compensation could be applied on the basis of the **“no net loss” principle**, as part of the supplementary measures of the river basin management plan.

Box 7: The “no net loss” principle in Ireland

The “no net loss” principle estimates the potential impact after mitigation that a proposed development may have on its immediate environment. It then attempts to counterbalance that impact through an environmental enhancement project, as close as practicable to the development.

In Ireland, this principle has been adopted by the South Western Regional Fisheries Board when commenting on proposals for authorisation for large scale projects. However, this “no net loss” policy is not applied in the following cases:

- Firstly the areas with habitats that require protection and cannot be duplicated elsewhere are not suitable to such a policy,
- Secondly no loss of habitat can be condoned if it is possible to safeguard it,
- Thirdly an environmentally damaging project should only proceed if there are no alternatives and if it is in the public interest.

Supplementary measures for sediment transport management

The development of infrastructures or other interventions in rivers and estuaries, such as dredging and disposal, may influence the conditions of sediment transport and storage processes at the river basin scale. Modification of these conditions may result in important changes for aquatic habitats (e.g. siltation of river beds, erosion of beds and banks, receding deltas, infilling of estuaries), as well as changes for the maintenance of some infrastructures (e.g. infilling of reservoirs, deposition in navigation channels, erosion of bridge supports). In this respect, sediment transport is a key consideration for certain water uses and in determining hydro-morphological status or physical alterations at the river basin scale.

Sediment transport is not directly addressed by EU specific legislation. Some international conventions do regulate certain marine related activities, such as the disposal of dredged sediment in estuarine and coastal areas⁷. Given the impacts of sediment on water uses and/or aquatic habitats (as described earlier), supplementary measures dealing with sediment transport management could be part of the (sub) basin river management plans to support the achievement of the WFD objectives.

⁷ For example the London Convention, OSPAR (Oslo Paris Convention), HELCOM (Helsinki Commission), Barcelona Convention, Black Sea Convention.

Though data and knowledge are often insufficient for comprehensive sediment transport management at the river basin scale, it seems already possible to take into account this issue in some cases. For example:

- In areas where sediment transport and storage are well monitored and studied (e.g. in estuaries used for navigation purposes).
- In situations where simple and low-cost management measures to restore sediment transport continuity are possible (e.g. opening of water gates for mills that are no longer used).

Preventive approaches are also relevant: regular dam management, regular maintenance work with soft techniques often allow that erosion and impairment of sediment transport are avoided.

For the longer term, investments are needed to improve knowledge and understanding of sediment transport at the river basin scale⁸.

⁸ More information can be found on www.sednet.org. Sednet is a European network of experts from science, administration and industry aimed at incorporating sediment issues and knowledge into European strategies to support the achievement of a good environmental status and to develop new tools for sediment management.

5. CONCLUSIONS

Integration between water, energy, transport and flood management policies is beneficial since it will create synergies and avoid potential inconsistencies and mitigate possible conflicts between water users and environmentalists. It is paramount that the different policies are implemented in a coordinated way, because it will otherwise result in delays, increased costs and/or lowest levels of ambition for all of them.

Recognition of the need and the legitimacy of each policy is the pre-requisite for integration. In addition to policy definition and project implementation, the **planning and programming level** is a main key to success to ensure integrated development strategies.

Enhancement of the dialogue and the co-operation processes between the different competent authorities, stakeholders and NGOs is a priority task in order to take into account all the interests and to achieve a good balance between water uses and protection.

Practical examples in this paper have shown that positive experiences exist and that integration, though an ambitious challenge, is possible provided sustainable development strategies are chosen.

ANNEX I: LIST OF EXAMPLES

The case studies below are provided by Member States, stakeholders and NGOs and do not necessarily reflect the opinion of the European Commission.

CONTENTS

A. Economic analyses and instruments

[1. Feed-in tariffs in Germany](#)

[2. Eco-labelling](#)

[3. Wide approach to water services and water uses for cost recovery analysis in the Seine-Normandie District](#)

B. Early planning and public participation

[4. The Scheldt estuary in 2010](#)

[5. Added-value of public participation and interdisciplinary dialogue in the French Adour-Garonne Water Agency](#)

[6. Stakeholder engagement in maintenance dredging decision-making in the UK](#)

C. Hydropower

[7. Guidelines for authorisation procedures in Germany](#)

[8. Protection plans and master plans in Norway as a part of the River Basin Management Plan \(RBMP\) under the WFD](#)

D. Navigation and Ports

[9. Extract of the PIANC guidelines](#)

[10. Integrated ports development approach, the New! Delta project](#)

[11. Immingham Outer Harbour development](#)

E. Flood protection

[12. 'Space for river' in the Loire/Allier](#)

[13. Room for the River in the Rhine Delta](#)

[14. Making Space for Water in England](#)

[15. Flood plain restoration: Tisza](#)

[16. Coastal Flood Plain Restoration – Frieston Shore, The Wash, England](#)

F. River Basin Management Plans

[17. Restoration of Salmon in the Rhine](#)

[18. Dam removal on the Mirna River, Slovenia](#)

DESCRIPTION OF EXAMPLES

A. Economic analyses and instruments

[1. Feed-in tariffs in Germany](#)

Germany's revised Renewable Energy Sources Act (Act Revising the Renewable Energy Sources Act of July 21, 2004) governs rates for hydropower, wind power, solar, geothermal and biomass electricity. The statute stipulates that the regenerative use of hydropower at the latter's source via hydropower plants is subject to a charge. The tariffs within the range of 3,70 and 9,67 ct/kWh of the revised Renewable Energy Sources Act (RESA) are defined according to plant capacity (i.e. up to 0.5 MW, 0.5-5 MW, and 5-150 MW). The RESA ties

these hydropower feed-in rates to prove that the use of hydropower either achieves good ecological surface water status or substantially improves it. The federal ministry for the Environment, Nature Conservation and Nuclear Safety published a guideline to define the essential criteria to improve the ecological situation in the range of hydropower plants. Of the various biological, hydromorphological and physico-chemical quality elements mentioned in the Water Framework Directive, those most amenable to change via human intervention are the composition and abundance of aquatic animal and plant life, water balance, and river continuity and morphology. Inasmuch as such intervention can be realized in the domains of

- Biological continuity,
- Minimum flow,
- Debris management and
- Reservoir management.

These four variables come most into play in assessing the manner in which improved ecological status or potential brought about by new or modernized hydropower plants should entitle these facilities to charge for their output pursuant to the revised RESA.

<http://www.erneuerbare-energien.de/> Guideline for hydropower tariffs charged by new and modernized hydropower plants under Germany's Renewable Energy Sources Act.

2. Eco-labelling

Eco-labels recognise environmental efforts beyond the existing environmental legislation. Suppliers of goods and services under eco-labels guarantee higher environmental standards. In exchange, consumers pay the goods and the services at a higher price. This approach is thus completely voluntary for both suppliers and the consumers, and is complementary to existing legislation.

Regarding labelling, one of the key questions is the selection of the criteria and the standards that will have to be met in order to justify a specific label. For example, initiatives for labelling electricity supplies in the European countries are being developed, which take into account ecological improvements including environmental flows, sediment flushing, fish passages and wetland restoration. However, none of the used criteria are agreed at the EU level.

3. Wide approach to water services and water uses for cost recovery analysis in the Seine-Normandie District

In the French Seine-Normandie basin, a wide interpretation for water services and uses is applied: it was decided by the technical group working on behalf of the Basin Authority to include navigation and hydropower in the definition of water services.. Indeed, as the Seine-Normandy impacts and pressures analysis stressed it, navigation and hydropower have significant impacts on the ecological status of the basin. Although navigation uses less than 5 % of the total river lengths, and hydropower is using a very small amount of the total water courses of the basin, these two activities provide the dominant cause of the designation of the numerous heavily modified water bodies in the basin. And this designation was done with large agreement of local representatives of navigation and hydropower activities. This was considered as a good proof of significant impact. However, up to now data on hydropower were not yet sufficient to produce a cost-recovery assessment. So only cost-recovery for navigation will be described below, based on extracts from Seine-Normandy basin article 5

characterisation report (downloadable in English at : <http://www.eau-seine-normandie.fr/index.php?id=2258>).

Cost-recovery evaluation for navigation

Navigation uses water diverted via canals, and water courses whose streamflow regime is influenced by the action of dams, locks and gauging of water courses. In this respect, these activities are transport-related water services.

This activity generates total expenditure estimated at €675 million/year, paid by *Voies Navigables de France*, by the ports, and by navigation companies, for the maintenance, operation and development of river navigation. Out of this amount, subsidies come to €11 million/year (or 16% of costs) of which 80% comes from the State and the European Union and 20% from the local authorities. The environmental damage caused by this service mainly comes from the infrastructure in place (and, marginally, from the passage of boats): dams, artificialisation of riverbanks, etc. For its calculable part, it is evaluated at €35 million / year at least (the loss of biodiversity is considered impossible to calculate), but this figure partially covers damage to the morphology of water courses, which is also caused by other pressures than navigation. This would lead to conclude that the basic monetary cost-recovery ratio for navigation in Seine-Normandy basin is of 84 %, whereas the comprehensive environmental cost-recovery would be assessed at roughly 80 %.

C. Early planning and public participation

4. The Scheldt estuary in 2010

The estuary of the Scheldt River is located partly in the Flanders region of Belgium and partly in the Netherlands. Flanders and the Netherlands have established three long-term objectives for the Scheldt estuary:

- Safety: maximum protection against flooding in the region
- Accessibility: optimum accessibility to the harbours on the Scheldt estuary
- Natural environment: a dynamic, healthy natural environment

Already in 2001, a common long term vision was adopted on these issues by both governments. This vision resulted in the adoption of the 'Scheldt Estuary Development Plan 2010' in 2005. This development plan contains resolutions and measures regarding the improvement of the safety, accessibility and natural environment of the estuary, which are now being implemented.

To compose this development plan, a strategic environmental assessment and a social cost/benefit analysis were carried out. For more information: www.proses2010.be or www.proses2010.nl

5. Added-value of public participation and interdisciplinary dialogue in the French Adour-Garonne Water Agency

The environmental stake in the « Hydro peaking challenge » of the French Adour-Garonne District Water Agency is the protection of salmonids spawning areas and the improvement in reproduction conditions of migratory species like salmon in the Dordogne basin (in the south west of France).

In this context it was first asked to Electricité de France (EDF) to considerably limit the variations in the discharges on two important hydro-energetic chains on Dordogne and Garonne rivers.

Because of strong constraints and losses imposed by this demand on the hydroelectricity generation, the measures initially asked to EDF were too high to be borne by EDF or by the Water Agency or other rivers users.

In order to find new solutions to better conciliate the salmonids protection and the electricity demand satisfaction, it was decided in 1997 to create a working group bringing together the Water Agency, a public establishment EPIDOR (*Etablissement Public Interdépartemental de la DORdogne*), Government representatives, fishermen federation, environmental associations, experts (MIGADO) and EDF.

Thanks to the dialogue and the collaboration between the different actors on the basis of their competences in the fields of energy, biology and economics, it became possible for alternative solutions to emerge.

The solution finally adopted is reasonably good for the community and the various actors.

↳ Instead of very strong hydroelectricity generation restrictions, it consists of a mix of complementary measures concerning on the one hand of flow regulation, but with less stringent constraints for hydroelectricity, on the other hand the aquatic environment itself, with the moving of spawning areas.

↳ The analysis of the environmental and economic impacts shows that these measures lead to:

✓ A very small loss in environmental performances compared to the objective that was to protect all the spawning areas and that probably could not have been achieved even with the constraints initially imposed;

✓ A very large gain in terms of cost of measures and a cost that may be shared between EDF and the Water Agency.

Such results prove the usefulness of the dialogue between actors and of the involvement of the stakeholders as early as possible.

6. Stakeholder engagement in maintenance dredging decision-making in the UK

Several locations on the tidal Thames in England require regular maintenance dredging to ensure continued safety of navigation and to provide access to berths. In total, approximately 500,000 m³ is dredged annually of which around 50,000 m³ is disposed to land-based sites managed for nature conservation benefits. Most of the remainder is dispersed within the estuarine system to prevent long-term depletion of the sediment budget.

The Port of London Authority (PLA) is responsible for dredging of the main channel and, as the regulator of dredging, also issues licences to operators to carry out dredging in access channels and berths. Historically, the nature of the licensing process meant that stakeholders neither had a good understanding of why dredging was required/what was involved, or how decisions were made. In particular, environmental groups were unclear how environmental sensitivities were considered: concerns had been expressed about the possibility of impacts of maintenance dredging on intertidal habitats, juvenile or migrating fish, and the physical processes operating in the estuary. There was no evidence of particular adverse impacts, but data were lacking in some areas. The PLA had carried out research and monitoring but in isolation from the wider community. The issue was more one of perception and a lack of mutual understanding between stakeholders.

To deal with this an initiative was promoted to facilitate dialogue and information exchange. A framework was established for guiding decision making, including dialogue with stakeholders represented on a neutrally-facilitated 'dredging liaison group'. In addition, a web-based GIS 'information exchange system' was set up, enabling stakeholders to better understand the location and scale of dredging activity, and share information they wanted the

PLA to consider in making decisions on dredging licence applications. Data collection programmes, modelling and monitoring were also initiated to improve understanding in certain key areas including the hydromorphology and the sedimentary regime of the estuary.

Additional benefits of this process included a change in dredging techniques from conventional dredge and dispose to more sustainable sediment management and recirculation; a better ability to predict and avoid/mitigate impacts; greater confidence that potential ecological impacts would be identified and resolved, and improved planning of dredging programmes to periods of lower ecological sensitivity.

Overall the framework has resulted in better communication and shared understanding with stakeholders as well as reduced conflict and associated delays, etc.

For further information, see www.portoflondon.co.uk

D. Hydropower

[7. Guidelines for authorisation procedures in Germany](#)

In **Germany** the technical and legal criteria for the assessment of hydropower installations take into account EU, German federal and German Länder (regional states) regulations. The following EU environmental regulations and directives contain provisions that apply to the design, construction and operation of hydropower installations: 2001/77/ EC (furtherance of renewable energy development), 2003/35/EC (environmental impact assessments for specific projects), 92/43/ EEC (preservation of natural habitats and the flora and fauna therein), the EU flora, fauna and habitat (FFH) directive, 79/409/EEC (bird protection), 2000/60/EC (Water Framework Directive). Hydropower installations also fall within the scope of German statutes pertaining to environmental impact studies (Umweltverträglichkeitsprüfung), water resources management (Wasserhaushaltsgesetz), nature protection (Bundesnaturschutzgesetz), as well as the applicable and highly specific legal regulations that have been enacted by the German Länder pertaining to hydropower installation assessment.

[8. Protection plans and master plans in Norway as a part of the River Basin Management Plan \(RBMP\) under the WFD](#)

The Water Framework Directive is not yet a part of the EEA agreement between the EU and the EEA (Norway, Iceland and Lichtenstein). By all accounts this is to take place within the end of 2006. This means that Norway has not yet transposed the WFD and the time schedule for Norway will be six years behind the compared to the member countries. Norway will however voluntarily follow the Member States timetable for a large number of water bodies as we have come a long way in building the practicable systems for the implementation and through participation in various WFD-fora have gained considerable experience and knowledge.

Protection Plans for Watercourses

The conflict between hydropower development schemes and environmental considerations brought about a need for protection plans for rivers and lakes as well as for master plans concerning hydropower development. Protection plans for inland waters were initiated in the early 1960s, the first plan was past through Parliament in 1973 and the final one in 1993. In 2005 the plans were supplemented and expanded. By these plans, 341 watercourses have been protected against hydropower development.

The purpose of the **protection plans** is to safeguard complete watersheds to maintain the environmental diversity stretching from the mountains to the fjords. The current plans only protect against hydropower, but a restraint policy should also be exerted towards other kinds of development activities. However, other activities may be permitted in accordance with the licensing system pursuant to the Water Resources Act. This may sometimes result in conflicting situations, where a protected watercourse/watershed actually can be exploited for other uses than hydropower uses that can have even greater environmental impacts. There is also an opening for development of mini- and micro hydropower (<1 MW) in protected watercourses, but only if the development is not contradictory to any of the protection criteria. In practice, the policy is very restrictive and permissions are only given in special cases.

Master Plan for Hydropower Development

A white paper to the Parliament in 1980, *Norway's future energy- use and production*, asked for development of a **national master plan for hydropower**. The Government was in demand for an extended planning and licensing system that took into account not only the particular hydropower scheme, but also hydropower development at a broader scale, including consideration of socioeconomic and environmental issues. The plan includes many strategic elements comparable to a SEA and was produced by the Directorate for Nature Conservation. Altogether 310 hydropower schemes larger than 5 GWh/year were considered with respect to project economy and it also comprised possible impacts on the regional economy and conflicts with other user- and protection interests, amongst them environmental interests (13 topics were considered). Based on an overall assessment, the projects were then divided into three categories:

Category I comprises the hydropower projects that are ready for immediate licensing and consecutively "go projects",

Category II comprises the hydropower projects that need Parliament approval, and

Category III cover "no go" projects due to disproportionately high development costs and/or high degree of conflict with other user interests, including environmental interests.

The plan has later been supplemented and category II and III have been merged.

Regional Plans for Small Hydropower

In Norway, the interest for small hydropower (<10 MW) is growing rapidly, and more than 200 applications are currently in some stage of the licensing process. The licensing follows the regulations in the Water Resources Act, but is simplified compared to larger projects. A general description of possible environmental impacts and conflicts is required, and a separate and more detailed report on biodiversity is compulsory.

In order to ensure better planning and handling of cumulative impacts arising from several separate projects within a limited area or watershed, the Government has called for **development of master plans at the regional level**. These plans will also increase predictability and provide guidance for developers, presumably resulting in better applications and discouragement of poorly planned projects. The county administrations will coordinate the planning process pursuant to the Planning and Building Act. Final plans will be approved by the county councils, securing public participation and transparency. The plans will be developed in line with the objectives, principles and procedural requirements of the WFD and will constitute a part of the river basin management plan (**RBMP**) in accordance with the WFD. The river basin districts are administered by the county administration and the planning for small scale hydro will in practical terms be a part of the RBM planning.

As a basis for the regional planning, the Ministry of Oil and Energy, together with the Ministry of Environment, will provide for national guidelines as a tool for the regional

authorities for development of plans and to promote harmonisation of the planning procedures. Draft guidelines have been prepared by a committee consisting of representatives from various agencies, including the Water Resources and Energy Directorate, the Directorate for Nature Management and the Directorate for Cultural Heritage, and also with input from the regional authorities.

The first step in the planning process will be to demarcate “planning areas” in each county based on the resource maps for small hydropower (development potential) that are available from the Directorate for Water Resources and Energy. It is recommended to carry out planning first in areas where the density of feasible projects is high (clusters) and where conflicts are not likely to occur. **Second step** implies mapping of various interests (topics) that are sensitive to small hydropower, such as landscape, biodiversity, recreation and tourism, cultural heritage, salmon and fishery, unaffected “wilderness” areas without major infrastructure development (at least 1 kilometre away from such development), and Sami interests (reindeer husbandry) that are mainly associated with northern Norway. The topical areas within each of the planning areas will be defined and classified according to their intrinsic “value”: High, medium and low value. Use of available EIA methodology is generally recommended, although it may have to be adapted to serve the specific purpose. By combing the resource maps for small hydropower and the topical maps, e.g. by use of overlay, possible areas of conflict will appear. Methodologies for classification of possible cumulative effects and related conflicts are less developed, and the classification will therefore have to rely more on expert judgement.

The final step includes development of management policies, strategies and regulative measures based on the systematised information for each of the planning areas. The counties can make references to the plan during the formal inquiry, which is part of the licensing process. Hence, approved plans and inquiries will be directional for the licensing process at the national level. It has been suggested to announce joint start-up of planning in all the relevant counties and to have one year trial period for evaluation and exchange of experiences.

The national guidelines (draft) also contain a standard framework and template for the case-by-case assessment of small-hydropower applications as part of the licensing process at the state level. The guidelines for assessment are derived from the national policies and goals for each sector/topic, and thus they are also meant to be normative for the planning at the regional level.

E. Navigation and Ports

[9. Extract of the PIANC guidelines](#)

The PIANC guidelines on sustainable inland waterways and navigation (www.pianc.org/download03, note that correspondence concerning passwords can be addressed to wfd@pianc.info) indicate that current development methods include taking the measures necessary to reconcile the requirements of different uses. The overriding aim has become planning for the future with a strict regard for sustainable development. Within the context of these new methods, it is important that new projects be assessed taking into consideration the main natural functions of river systems; in other words that they ensure maintenance of the key functions and ecological functions, including:

Morphological processes (erosion, sediment transport and sedimentation)

Maintenance of the hydrological balance (e.g. flood pulse)

Maintenance of the sediment balance

Provision of habitat (ecological continuum)

Maintenance of biological and chemical processes (nutrient cycles)

Maintaining these processes does not mean that any change has to be prohibited, but rather that each process must be carefully examined, that “before” and “after” situations have to be accurately assessed, and that all possible consequences must be appreciated and considered with respect to the economic or other benefits derived from project implementation. This overall assessment must be carried out not just at the local level, but also for the river basin as a whole. In other words, the assessment of waterway schemes (from the ecological, economic and social standpoints) should be carried out for the scheme as a whole, rather than for its individual components, considering all alternatives and taking into account river basin management objectives.

Navigation is a unique mode of transport with the potential to use a resource without long-term adverse consequences. There may be scope in some situations for vessels to be adapted to the conditions of particular rivers, rather than the waterways adapted to common standards and designs. Measures to achieve needed depth, clearance, width, or velocity can be selected to minimize impacts upon important waterway functions. These measures can even be modified to provide environmental enhancements.

Financing institutions and governments need to ensure that the full environmental and social costs and the long-term effects of proposed waterway schemes are included in cost-benefit analyses. Affected parties must fully participate in the decision-making process regarding any waterway. This includes actively participating through the entire project cycle, from identification and preparation to implementation and evaluation. Therefore, a legal and institutional framework for civil society participation at the national and local levels must be established. Local participation in decision-making is, therefore, essential. Participation is not merely a set of formal requirements but also a cost-effective source of added-value for long-term sustainable use of rivers as transportation ways.

Effective participation calls for full access to information, a time schedule appropriate to local social and cultural conditions and adequate resources. It also includes empowerment (i.e., capacity building by education and technical assistance) to enable citizens and organisations to assert their rights and interest in the process.

[10. Integrated ports development approach, the New! Delta project](#)

New! Delta is an INTERREG III B project, gathering the Province of South Holland, the ports of Rotterdam, Antwerp and Rouen, the IMI Institute for Infrastructure, Environment and Innovation, the ABP Marine Environmental Research Ltd, the Delft University of Technology and the Upper-Normandy Regional Direction for Environment.

Against the background of the European Birds and Habitats Directives, New! Delta is seeking to foster the protection of Natura 2000 sites as an integral part of economic development in ports and estuaries. The project has started in 2004 and should end by October 2007. It is structured in 7 themes:

- Pooling resources for Natura 2000,
- Establishment of ecological goals and indicators (also in relation to the WFD)
- Creation and restoration of coastal and estuarine habitats
- Cross-sectoral long-term port and estuary visions
- Cause-effect relationship

Sustainable dredging strategy

Coastal morphology and coastal defences in vicinity of ports.

Though directly tailored for the implementation of the Birds and the Habitats directives, this ongoing project can deliver recommendations that are also relevant for WFD implementation in estuaries.

Contact: <http://www.newdelta.org/navigatie/frameset.asp>

11. Immingham Outer Harbour development

Associated British Ports proposed in 2001 to develop a five berth roll-on, roll-off (ro-ro) terminal in a tidal harbour dredged into the foreshore behind the existing bulk terminal at Immingham on the River Humber. Expansion was needed because ro-ro traffic had increased substantially over recent years and was expected to continue to increase and existing facilities at Immingham were inadequate to meet the future demand, in particular, to accommodate modern, larger vessels. The project was going to have significant environmental implications and the approach adopted by ABP from the start was one of seeking cooperation in order to arrive at a sustainable solution bringing benefits for all parties. Thus an agreement was negotiated with English Nature who is the Government's advisors on nature conservation, the Environment Agency who will be the competent authority for implementing the WFD, and the Royal Society for the Protection of Birds, the Lincolnshire Wildlife Trust and the Yorkshire Wildlife Trust, these three bodies being non governmental environmental organisations. This agreement contained measures including the managed realignment of agricultural land, of an area significantly greater than the area which would be lost to the proposed Harbour works, and a creek habitat enhancement scheme, to enable the coherence of the Natura 2000 network to be protected and which satisfied the need for adequate compensation within the terms of the Wild Birds and Habitats Directive. The overall package also served to enhance flood protection in the estuary. So, the inter tidal mudflats were replaced with new equivalents, both in the Inner and in the Outer Estuary.

This successful example of working in partnership offers a model to those seeking appropriate solutions within other legislative regimes to the difficult issue of promoting sustainable development.

F. Flood protection

12. 'Space for river' in the Loire/Allier

In France, a very popular campaign to save the Loire and its tributaries from being regulated (1986-1993) laid the ground to a new river management approach. Academics worked out a new concept that the opponents to the river development plan then advocated for. The concept provided for more space for rivers in order for them to primarily maintain their functions. This allowed for integrating flood defence. This concept is named "Espace de Liberté" ("free space for rivers") and was experimented at the Loire and the Allier rivers in the framework of a new Management Programme for the river basin.

Starting in 1993, the Loire nature Programme co-funded by the EU (in the framework of a LIFE programme up to 1998) aimed at inter alia finding solutions to erosion-generated problems (incision). Along 200 km of its "free valley", the Loire rate of bank erosion reaches 11 ha/year. The volume of sediment input yearly reaches around 385 000 m³. Along its 220 km "free valley", the Allier River erodes nearly 35 ha/year (1 220 000 m³ of sediment per year). Globally it has been calculated that in the active meander's area, the Loire River can

provide 10 to 15 000 m³ of sediment from its banks/year/km of river, that is enough to equilibrate its transport capacity. Also in the Allier River's active area, the annual rate of lateral erosion reaches 5 to 15 m. The sediment reloading can be around 15 to 20 000 m³ of sediment/year/km.

The Loire and especially the Allier river dynamics are still very active. Throughout the Loire and Allier Rivers a series of activities were developed by regional Nature Trusts, Birdlife voluntary organisations and WWF to implement the free space for rivers. Ways through which local authorities, state institutions and NGOs developed together management instruments were experimented and proved their efficiency. One of these solutions proposed by the Loire nature Programme to face erosion problems has been to facilitate land control while participating financially in land acquisition in eroded zones. Contracts were signed with private owners and farmers to acquire erodible land or manage it (through renting for example).

13. Room for the River in the Rhine Delta

Safety against extreme river floods

Due to anticipated climatic changes the Rhine delta river branches have to accommodate ever-higher extreme discharges. Until recently it was standard policy to raise the crest levels of the dikes to maintain the required level of flood protection. This centuries old policy was abandoned in 2000 in favour of 'Room for the River'. In the new policy, river cross sections are widened by situating the dikes further away from the river, or by lowering the river forelands. This will result in lower flood levels. By the year 2015 the river should be able to safely discharge 16,000 m³/s.

Improvement of overall environmental conditions

In giving 'Room for the River' care should be taken not to affect valuable features of landscape, nature and cultural history. More space can also be found by enlarging the river channel within the dikes. In the process, one should aim at a balance between present and foreseeable future spatial requirements, keeping an open eye for every opportunity to enhance safety as well as the master landscaping and the improvement of overall environmental conditions. For more information, see: http://www.ruimtevoorderivier.nl/index.asp?p_id=420

14. Making Space for Water in England

An integrated strategy for flood and coastal erosion risk management.

In July 2004 an extensive consultation exercise was undertaken seeking views on a broad range of flood and coastal erosion risk management issues for England to inform development for a new strategy for the next 20 years and beyond. This consultation resulted in March 2005 in a new vision for flood management made of the following elements:

- The concept of sustainable development will be firmly rooted in all flood risk management decisions and operations taking full account of the social, environmental and economic pillars.
- Flood and coastal erosion risk management will be clearly embedded across a range of government policies including planning, urban and rural development, agriculture, transport and the natural and historic environment.
- There will be increased use of co-funding with other bodies and schemes to improve cost effective management and maximum benefits.
- Catchment Flood Management and Shoreline Management Plans will provide better local participation in decision making and a more holistic approach to assessment of

options within a broader planning matrix including Integrated Coastal Zone Management and River Basin Management Plans.

- There will be transparent and measurable targets and performance indicators in terms of managing risks to people, property and the environment.

The results of the strategy will be seen in the form of more flood and coastal erosion solutions working with natural processes. This will be achieved by making more space for water in the environment, through for example appropriate use of managed re-alignment to widen river corridors and areas of inter-tidal habitat, and of multi-functional wetlands that provide wildlife and recreational resource.

The new strategic direction is currently being taken forward across government departments and agencies.

More information is available at the website:

<http://www.defra.gov.uk/enviro/fcd/policy/strategy.htm>

15. Flood plain restoration: Tisza

From Sep 2005 – 2007 the Hungarian Tisza River Floodplain will be conserved and restored through Integrated Floodplain Management.

The project is managed by the UNDP/Global Environment Facility and will mainstream biodiversity conservation within floodplain management across the Tisza River Floodplain. The project will significantly improve management of 1,600 km² through activities within pilot areas, while moderately influence an estimated area of 9,400 km² (about 20% of the Great Hungarian Plain) applying supportive policy environment and institutional capacity building at the local level.

The project works on local level with local initiatives providing support development of Action plans oriented to integrated and sustainable management of land, water, habitats and biodiversity, that support the socio-economic development.

For more information, see:
http://europeandcis.undp.org/WaterWiki/index.php/Conservation_and_Restoration_of_the_Global_Significant_Biodiversity_of_the_Tisza_River_Floodplain_through_Integrated_Floodplain_Management

Besides, Hungary is planning to use farmland to hold up to a billion cubic meters of water to prevent flooding elsewhere. The Hungarian government will create a dozen reservoirs on farmland near the Tisza that will be allowed to flood during emergencies. Two will be operational by the end of 2006 and up to 12 by 2020.

16. Coastal Flood Plain Restoration – Frieston Shore, The Wash, England

This is an example of a managed re-alignment scheme used where it is the best engineering option to reduce flood risk; it has the side effect of increasing biodiversity. The techniques demonstrated here are transferable to other situations requiring mitigation.

The work was to provide a 1:200 year level of defence to over 80,000Ha of low lying fen land, many villages and the town of Boston. Before work started the flood banks were in varying states of repair and offered different levels of protection. A Flood Risk strategy was developed for the area after extensive monitoring and modelling of the site. 1.1km of existing secondary defences (banks) at the rear of the realignment site were raised and strengthened, and a 500m new defence built. Field drains were filled, the vegetation was removed and the field was ploughed and levelled, and new primary creeks were created using an excavator. Three breaches were made in the sea wall, each 50m wide, in order to open the site to tidal action. Material for the new defence was sourced from the next field and a lagoon was created

as part of that process. The realignment site was purchased by the Royal Society for the Protection of Birds (RSPB) and opened as a reserve.

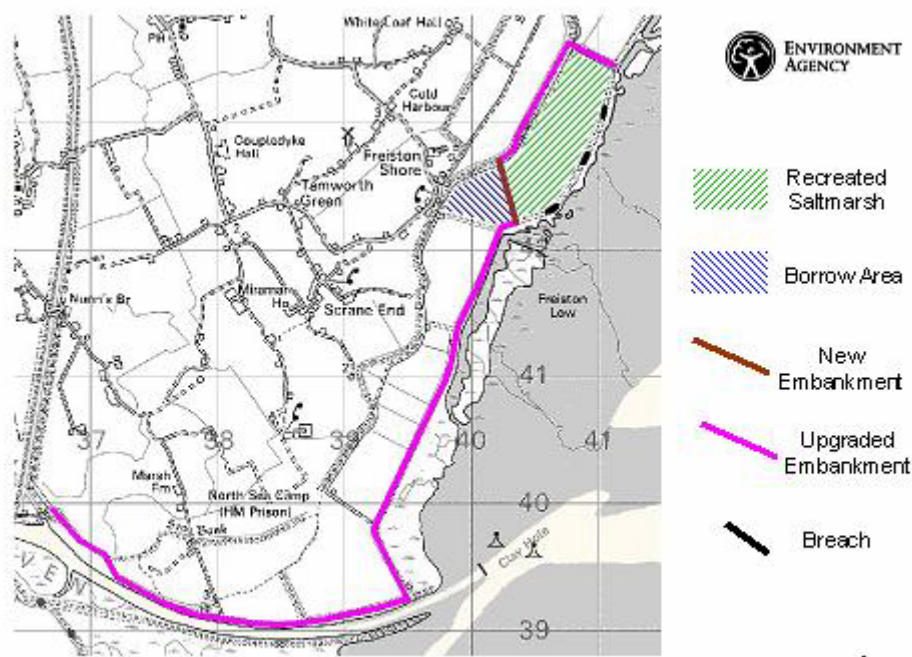


Figure 1 – plan of works

This site is a functioning flood defence scheme. As it has now been turned into a nature reserve it has brought additional benefits. The investment in flood defence funding was matched by European 5B funding, which has paid for access and other improvements. The reserve and other nearby wildlife areas attracted 57,000 visitors in 2002/03. The presence of the reserve is estimated to have attracted around £150,000 into the local economy during 2003. This is estimated to support over four full-time equivalent jobs in local businesses. The changes in elevation on the adjacent mudflats have caused unexpected damage to a local oyster farm and compensation payments have been made.

In many other areas this technique may be an effectively flood risk management solution, help ensure no deterioration and to increase ecological status.

G. River Basin Management Plans

[17. Restoration of Salmon in the Rhine](#)

On the Rhine, the programme on the restoration of migratory fish with the salmon as its symbol started in 1988. In order to be able to fulfil their life cycle, salmon need unobstructed migration routes between salt and fresh water, between the feeding grounds in the sea and clean rivers with gravel beds serving as spawning grounds and juvenile habitats. Success so far: annually, several hundreds of salmon return to the Rhine area. They attract public attention to the importance of unobstructed, nature near waterways and show the importance of hydraulic fishways. A good example is given by the fishway in Iffezheim (near Baden-Baden) on the Upper Rhine, which, since mid 2000, has been used by thousands of fish on their way upstream. The second big fishway some 25 km upstream at the Gamsheim barrage

will start operating in March 2006. So far, the salmon is not autochthonous in the Rhine. Natural reproduction numbers are not sufficient to speak of a self sustaining population. Human help and stocking measures will continue to be necessary for still some time. Since 1988, many measures aimed at improving fish migration, in particular upstream migration have been implemented, further measures are required. The problem of fish injured and killed during their downstream migration because hydropower installations lack protection remains to be solved.

For more information: <http://www.iksr.org>

18. Dam removal on the Mirna River, Slovenia

In 2004, a group of water engineers and ecologists planned to install a concrete fish pass on an old dam on the Mirna River. The project was to be projected and implemented as a part of the Bostanj water reservoir management.

Then, in 2005, as the group recognised the dam to be obsolete (it was once made for the purpose of water saw, which was out of operation for some time already) and that the projected fish pass would not function in a proper way, they came up with the idea to remove the old obsolete dam and replace it with a rocky glide. Consensus was soon reached on this by the engineers and the ecology experts. Also, the project was broadly supported by HSE d.o.o., the leading Slovene energy supply company.

Before the dam removal and the rocky glide installation, the ecosystem had the status of a dammed river, with a disrupted river continuum and thus an interrupted migration path of cyprinid and salmonid freshwater fish species.

After the dam removal and the rocky glide installation, hydromorphological and ecological improvements were obvious: an improvement of flow conditions, re-creation of mezzo hydromorphological structures (e. g. pools, rapids, riffles, sand bars and fords), improvement of the river continuum between rivers of the 1st (the Sava River) and 2nd order (the Mirna River), re-construction of the river continuum between the river and tributaries in the catchment area and migratory fish species gain migration possibility in order to use more spawning areas in the catchment area.

For the implementation of the project the usual administrative procedures took place, following prescriptions of the Slovene Construction Act and the Water Act.

ANNEX 2: LIST OF BOXES

Box 1: Background information on the Water Framework Directive..... 8

Box 2: Background information on the share of renewable energy in the EU 10

Box 3: Background information on main legislative or policy instruments regarding the development of inland waterways and maritime transport at EU level 13

Box 4: WFD stepwise approach for past and new developments: prevention, restoration, mitigation 18

Box 5: Comparison of the average external marginal costs between the different transport modes 20

Box 6: Total survival rate of long-distance migratory fishes at a chain of hydropower stations 26

Box 7: The “no net loss” principle in Ireland..... 27

ANNEX 3: COMPOSITION OF DRAFTING GROUP

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