Inter-sectoral cooperation in the Danube Basin: Joint Statement Inland Navigation and Guiding Principles on Sustainable Hydropower

Mr. Raimund MAIR
International Commission for the Protection of the Danube River (ICPDR)
Raimund.Mair@unvienna.org
The Danube River Basin

- 19 countries: Most international River Basin in the World
- Water cooperation: International Commission for the Protection of the Danube River (ICPDR)

- Contracting parties: 14 countries - 9 EU Member States, 5 Non EU Member States + European Union
Why inter-sectoral cooperation?
Gain from inter-sectoral cooperation and stakeholder involvement

Unilateral Decision

Intersectoral cooperation

Problem identified

Decision made

Implementation

Gain from intersectoral cooperation

After Creighton 2005
“Joint Statement” Inland Navigation and Environment
The Challenge

- How to ensure sustainable **water protection** and non-deterioration of Danube Basin water bodies & Nature Protection sites if **infrastructure projects** will be built?
- How to make a step from **confrontation** to reconciliation, **cooperation** or even win-win solutions?
- Can we **guide** infrastructure **development** that it won’t conflict with legal requirements for environmental protection but ensure their achievement?
The Challenge
Needs of IWT and Environment

Needs of Inland Waterway Transport

- Minimum **fairway dimensions**, i.e.
  - Depth and width of fairway
  - Curve radius
- **Construction / maintenance** e.g.:
  - Low-water regulation by hydraulic structures
  - Dredging and refilling of material
  - Location of infrastructure
- etc.

Needs of Ecological Integrity

- **Protection**/conservation of ecologically high-value rivers
- **Restoration** of modified/impacted river sections and their adjacent landscapes
- Dynamic and type-specific channel and floodplain environment
- Undisturbed longitudinal and lateral migration of all fish species
- Balanced **sediment** budget
- etc.
First response 2007: Cross-sector dialogue inland navigation & environment

Broad stakeholder process

- 12 Basin Governments
- 22 industry and environmental interest groups
- 3 River Commissions
- 3 Workshops

“Joint Statement” (2007)
Joint Statement

Key principles

- Integrated planning process from the beginning
- Define goals for navigation and river/floodplain ecological integrity
- Ensure the comparability of alternatives (WFD Art. 4.7...)
- Minimize the impacts of engineering interventions and use Best Practice to achieve the required objective
- Apply EIAs with public input and respect WFD’s River Basin Management Plans
Inland Navigation & Environment

Follow-up activities

- 2010 "PLATINA Manual" further specifying integrated planning approach

- **Yearly joint follow-up meetings** between navigation and environmental sector
  - *Alternately organised* by 3 River Commissions in Danube basin
  - Exchange of **experiences** with practical application of principles
  - Facilitates **implementation process**
  - Keeping actors **involved and dedicated**

- **Apply good practices** in sustainable inland waterway planning
Good practices in sustainable waterway planning

- Down-sized groynes
- Re-connected side-arms
- Restored river banks
The four essential features for integrated planning are:

- **Identify integrated project objectives** incorporating IWT aims, environmental needs and the objectives of other uses of the river reach such as water management, recreation and fisheries.

- **Integrate relevant stakeholders** from the initial scoping phase of a project.

- **Carry out an integrated planning process** to translate the IWT and environment objectives into concrete project measures creating, where possible, win-win results.

- **Conduct comprehensive environmental monitoring** before, during and after the project works, enabling an adaptive planning and implementation approach as well as evaluating the project’s success.

→ Conducting an integrated planning process requires adequate funding!
Guiding Principles on Sustainable Hydropower
Hydropower plants in the Danube River Basin (2012)

Majority of electricity generated by large hydropower

- ~ 300 large facilities (>10MW) generate ~ 90% of electricity from HP
- > 8,000 small facilities (<10MW) generate ~ 10% of electricity from HP
Hydropower
Outlook: Increasing trends

Outlook hydropower:

⇒ Intention to increase hydropower capacities by Danube countries

Main drivers:

⇒ To increase share of renewable energy
⇒ Reduction of greenhouse gas emissions and climate protection policies
⇒ Integration of other forms of renewable energy (wind, solar)

Electricity production from hydropower currently and expected in 2020, in GWh/year (excluding pumped storage)
Impacts of hydropower
Challenge for WFD implementation

Altered flow regime

Ecological impacts

Altered sediment dynamics
Impacts – why should we care?

- Environmental protection and *biodiversity conservation* issues
- Negative impacts of hydropower generation have led to rather negative reception of new projects by civil society and financial institutions → assess impacts in detail
- Economic, social and environmental *benefits can be maximised* in case all benefits and impacts are considered from the very beginning
- Significant investments needed to *remediate negative impacts of existing facilities* to meet requirements of EU environmental legislation - *costs (much) higher* compared to initial consideration
- *Legal compliance* with existing legislation, i.e. WFD and N2000
Renewable Energy and Environment Legal framework

Ambitious EU legislation for energy + water

RES-e
European Renewable Energy Directive 2009/28/EC

Objectives:
to increase share of energy from renewable sources with target figures for 2020 for each state
States set national targets + decide on strategy; e.g. by targets for HP

WFD
EU Water Framework Directive 2000/60/EC

Objectives:
good ecological status of water bodies
No deterioration of status

Without cross-sectoral dialogue both sectors are at risk to fail achieving the objectives and legal compliance!
Sustainable Hydropower in the Danube Basin

- **2010**: Political mandate to develop „Guiding Principles on Sustainable Hydropower Development in the Danube Basin“
- **Lead**: Austria, Romania and Slovenia in the frame of the ICPDR
- **2011**: Process launched – involvement of administrations, stakeholders, NGOs, ...
- **6 Meetings, 2 Workshops**
- **June 2013**: Consensus reached and Guiding Principles adopted
Guiding Principles Sustainable Hydropower
Based on EU policy documents and recommendations

CIS Hydropower Workshop 2007

- (…) more holistic approaches for hydropower use are needed. The focus should be on catchment level and not only site-specific or on water body level.
- (…) participants recognised the advantages of pre-planning mechanisms to facilitate the (proper location) identification of suitable areas for new hydropower projects (…) assist the authorisation process
- At least 3 categories of areas could be distinguished for pre-planning: suitable, less favourable and non-favourable areas (…) identified with the involvement of all stakeholders based on transparent criteria
- (…) ensuring fish migration and ecological flow identified as priority measures

Statement of the Water Directors, Segovia, 2010

- Pre-planning mechanisms allocating “no-go” areas for new hydro-power projects should be developed (…) based on a dialogue between the different competent authorities, stakeholders and NGOs

CIS Hydropower Workshop 2011

- Good practice uses of strategic plans (…) upfront information to developers about where (geographically) gaining authorisation will be more or less difficult (…) strategic plans are framework for project level decision-making
- Good practice examples on WFD Article 4.7 (…) when considering better alternative options (…) whether alternative would provide equivalent benefit (…) alternative locations for a hydropower scheme usually cannot be restricted to the local level

EU Blueprint to Safeguard Europe’s Water Resources 2012

- Context of Article 4.7 (…) hydropower deserves specific attention (…) refurbishing and expanding existing installations should be given priority over new developments which should be underpinned by a strategic assessment at the river basin scale, selecting optimal locations in terms of energy production and lowest environmental impact
Hydropower Guiding Principles

- **Recommendations** based on EU legislation & EU policies
- **Strike for balance**
- **Need for practical application at national level**

**Guiding Principles promote**

1. Set of *general principles* (inclusiveness and transparency of process, call for holistic approaches, …)

2. Technical upgrading of *existing hydropower* plants combined with ecological restoration

3. **Strategic planning** approach for *new hydropower* based on two level assessment (regional + site specific) in order to find appropriate sites with lowest impacts in region

4. **Mitigation** of negative ecological impacts
Hydropower Guiding Principles

General principles

• Principle of **sustainability**
• Holistic approach in **energy policies**, incl. energy efficiency gains
• **Consideration of plant size and capacities** – taking **cumulative impacts** into account
• Weighing public interests in decision making → **hydropower is not automatically of overriding public interest** because it generates renewable energy
• Consideration of **climate change**
Technical upgrading and ecological restoration

• Need to reach WFD objectives – **Good Ecological Status/Potential** – Need for mitigation measures
• **Technical upgrading** should be promoted to **increase energy** production from existing facilities
• Should be **linked to ecological criteria** for improvement of the water status
• Combination of technical upgrading with ecological restoration implies a **win-win solution**
• **Should be promoted** by national energy strategies and instruments
Legal requirements for new hydropower projects?

• New **hydropower projects** can deteriorate water status and conflict with WFD “no deterioration principle”

• WFD Article 4(7) exceptionally allows deterioration of water status provided certain explicit conditions are met:
  – **Benefits** of project **outweigh** environmental **impacts**
  – No significantly better environmental options (i.e. **alternative locations** for projects!)
  – All practicable **mitigation measures** taken to minimize negative effects
  – Reasons to be explained in **River Basin Management Plan**

• Compliance with other relevant (environmental) legislation, i.e. Natura 2000, environmental impact assessment, etc.
Strategic planning for new hydropower development

Underlying principle for planning:
The higher the ecological/landscape value of a river stretch, the higher the energy output has to be.
Strategic planning approach for new hydropower development

Two-level assessment

1. National/Regional level – „WHERE“?
2. Project-Specific Level – „HOW“?

Favorable locations – “WHERE”

Danube basin-wide framework

Technical solutions – “HOW”

Not legally binding but serving as a guidance for national application

Transparent, structured, reproducible and criteria based approach on two levels

National/Regional Level

Regional assessment, classifying the potential appropriateness of water bodies for hydropower use, independently from individual application

> Hydroelectric potential
> Ecological and landscape value

Project-Specific Level

Project-specific assessment of the individual application by weighing all pros and cons

> Results of the regional assessment
> Project-specific criteria
> Further socio-economic aspects

Interactions
Strategic planning for new hydropower
National/Regional level assessment – WHERE?

Step One

Is hydropower development possible according to existing national or regional legislation/agreements?*

- no
- yes

Exclusion*

Step Two

Energy Management

Hydro-electrical Potential

Environment and Landscape

Criteria-based assessment of river stretches (energy management, environment and landscape value)

Weighing process with involvement of stakeholders and public

→ Provides information on suitability of river stretches for new hydropower development

FAVOURABLE for hydropower development

LESS-FAVOURABLE for hydropower development

NON-FAVOURABLE for hydropower development

Generally considered as possible

Possible under specific circumstances

Possible in exceptional cases*
Strategic planning for new hydropower

National/Regional level assessment – WHERE?

Recommended list for national/regional criteria

<table>
<thead>
<tr>
<th>National/Regional criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Energy Management</strong></td>
<td></td>
</tr>
<tr>
<td>Hydro-electrical potential (theoretical or line Potential)</td>
<td>Product between quantity of flow and head (GWh/TWh)</td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td></td>
</tr>
<tr>
<td>Naturalness</td>
<td>Status of river stretches/water body in relation to the deviation from type-specific natural conditions regarding hydrology, morphology, biological and sediment continuity as well as biological communities</td>
</tr>
<tr>
<td>Status of water body with regard to rarity and ecological value</td>
<td>Rarity of the river type, ecological status of a river stretch and sensitivity</td>
</tr>
<tr>
<td>Specific ecological structure and function of the river stretch also with regard to the whole catchment/sub-basin and in relation to ecosystem services</td>
<td>e.g. Particular habitats for sensitive/valuable fish species or other biological quality elements in the riverine ecology (e.g. red list species)</td>
</tr>
<tr>
<td>Conservation areas and protected sites</td>
<td>e.g. Natura 2000 areas (Birds and Habitats Directive), Ramsar sites (Ramsar Convention), UNESCO Biosphere Reserves, National, Regional and Nature Parks (IUCN I-IV)</td>
</tr>
<tr>
<td><strong>Landscape</strong></td>
<td></td>
</tr>
<tr>
<td>Naturalness</td>
<td>No significant anthropogenic impacts</td>
</tr>
<tr>
<td>Diversity</td>
<td>Intact terrestrial ecology with extensive use (e.g. small agriculture with low fertilizer use, sustainable forestry); diverse patterns of land use</td>
</tr>
<tr>
<td>Landscape scenery</td>
<td>e.g. aesthetic values, high architectonic and historical quality</td>
</tr>
<tr>
<td>Recreation value</td>
<td>Use for soft tourism and recreation, such as organized camping sites, canoeing, etc.</td>
</tr>
<tr>
<td>Cultural heritage</td>
<td>Historical buildings and villages or towns. Traditional practice such as handicrafts and culturing.</td>
</tr>
<tr>
<td>Spatial planning obligations</td>
<td>Legal regulation for different areas and uses</td>
</tr>
</tbody>
</table>

Set of relevant criteria for national/regional level assessment
Strategic planning for new hydropower

Set of criteria for project specific assessment – HOW?

<table>
<thead>
<tr>
<th>Project-specific criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Energy Management</strong></td>
<td></td>
</tr>
<tr>
<td>Hydropower plant size</td>
<td>Installed capacity</td>
</tr>
<tr>
<td>Hydropower plant type</td>
<td>e.g. run-of-river, diversion, storage, pumped storage</td>
</tr>
<tr>
<td>Security of supply</td>
<td>Production and supply of energy (Auto supply)</td>
</tr>
<tr>
<td>Quality of supply</td>
<td>Production characteristics – base load/ peak load (storage option, pumping storage)</td>
</tr>
<tr>
<td>Contribution to climate protection</td>
<td>Lower CO₂ emissions of the energy mix</td>
</tr>
<tr>
<td>Technical efficiency</td>
<td>Grid connection, potential use, size of plants</td>
</tr>
<tr>
<td><strong>Environment and water management</strong></td>
<td></td>
</tr>
<tr>
<td>Ecological impacts of the project</td>
<td>Longitudinal/lateral/vertical connectivity, impacts on habitats and biota taking into account already existing impacts</td>
</tr>
<tr>
<td>Flood control</td>
<td>Protection of sites at flood risk, alteration of flow regime</td>
</tr>
<tr>
<td>Irrigation</td>
<td>Positive or negative effects on water availability for irrigation</td>
</tr>
<tr>
<td>Sediment management</td>
<td>Reservoir sitation, bedload transport, sediment contamination, plant design</td>
</tr>
<tr>
<td>Surface and groundwater quantity</td>
<td>Infiltration and exfiltration, minimum ecological flow</td>
</tr>
<tr>
<td>Surface and groundwater quality</td>
<td>Nutrients, persistent organic substances, hazardous substances, thermal effects</td>
</tr>
<tr>
<td>Drinking water supply</td>
<td>Positive or negative effects on quality and service security</td>
</tr>
<tr>
<td>Bank protection and restoration</td>
<td>Foster erosive banks</td>
</tr>
<tr>
<td>Fisheries</td>
<td>Ensuring natural reproduction and fish migration across dams and residual water stretches</td>
</tr>
<tr>
<td>Effects of climate change</td>
<td>Changes in flow regime and impacts on economic feasibility of projects</td>
</tr>
<tr>
<td>Effects on water bodies already restored</td>
<td>Water bodies restored by public money should not be effected again</td>
</tr>
<tr>
<td><strong>Socio-economic criteria</strong></td>
<td></td>
</tr>
<tr>
<td>Conformity with local spatial planning</td>
<td>Compliance with the local regulations</td>
</tr>
<tr>
<td>Necessity of further infrastructure for construction and operation</td>
<td>Access, energy grids, etc.</td>
</tr>
<tr>
<td>Regional economic effects</td>
<td>Taxes, income for the public; investments in local economy, induced employment</td>
</tr>
<tr>
<td>Recreation, tourism</td>
<td>Potential positive and negative effects on tourism</td>
</tr>
<tr>
<td>Other socio-political considerations</td>
<td>depending on the local situation</td>
</tr>
</tbody>
</table>
Strategic planning for new hydropower

Benefits

Practical application of strategic planning approach for new hydropower provides broad range of potential benefits:

- **Energy sector**: Streamlined authorisation processes, improvement of predictability and upfront information where authorisation is likely

- **Environmental sector**: Transparency, involvement in decision making process, protection of sensitive river stretches

- **Authorities**: Increase of security for legal compliance, balanced approached with involvement of relevant actors at an early stage, accelerated implementation of legislation
Existing and new projects
Mitigation measures to make hydropower more sustainable

Fish migration aids for ensuring connectivity and access to habitats
Ensuring ecological flow requirements
Mitigating artificial flow fluctuations (hydropeaking)

+ other issues (sediment transport, improvement of lateral connectivity, etc.)
Summary and conclusions

- Ambitious **EU legislation in place** for transport, energy and water
- **Inter-sectoral cooperation is key** for sound and accelerated implementation
- **Guidance and approaches are in place** – challenge is practical application
- **Inland navigation** infrastructure projects
  - Taking into account objectives for navigation and environment from the beginning
  - Planning in alternatives and making use of good practice examples mitigating impacts
  - Involvement of relevant stakeholders; ensure funding of integrated planning process
- **Sustainable hydropower**
  - Technical upgrading and ecological restoration of existing facilities to achieve 'good status'
  - Strategic planning for new projects i.e. to ensure compliance with WFD Art. 4.7
  - Application of mitigation measures for existing and new hydropower
Thank you for your kind attention!

More information and related documents are available for download under http://www.icpdr.org
For info or further questions on this presentation, please contact:

Massimo Marra
JASPERS Networking and Competence Center
Senior Officer
ph: +352 4379 85007
m.marra@eib.org

www.jaspersnetwork.org
jaspersnetwork@eib.org