9th Steering Group Meeting of EUSDR
Priority Area 2
Budapest, 3-4 December 2014

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Sustainable Hydropower Development in the Danube Basin - Guiding Principles

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Water cooperation in the Danube River Basin

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- Danube: Most international River Basin in the world
- 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
- ICPDR: The platform for countries to draft and adopt the Danube River Basin Management and Danube Flood Risk Management Plans (EU Water Framework Directive and EU Floods Directive)

What is the issue?

Hydropower – Important Source of Renewable Energy

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Need for increase of renewables: Major driver for hydropower

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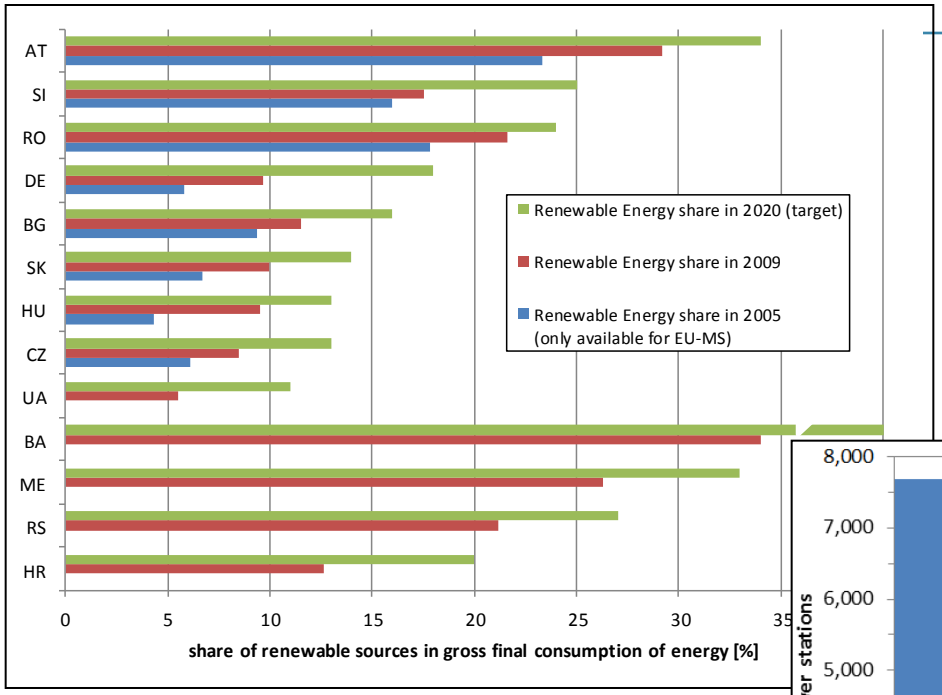
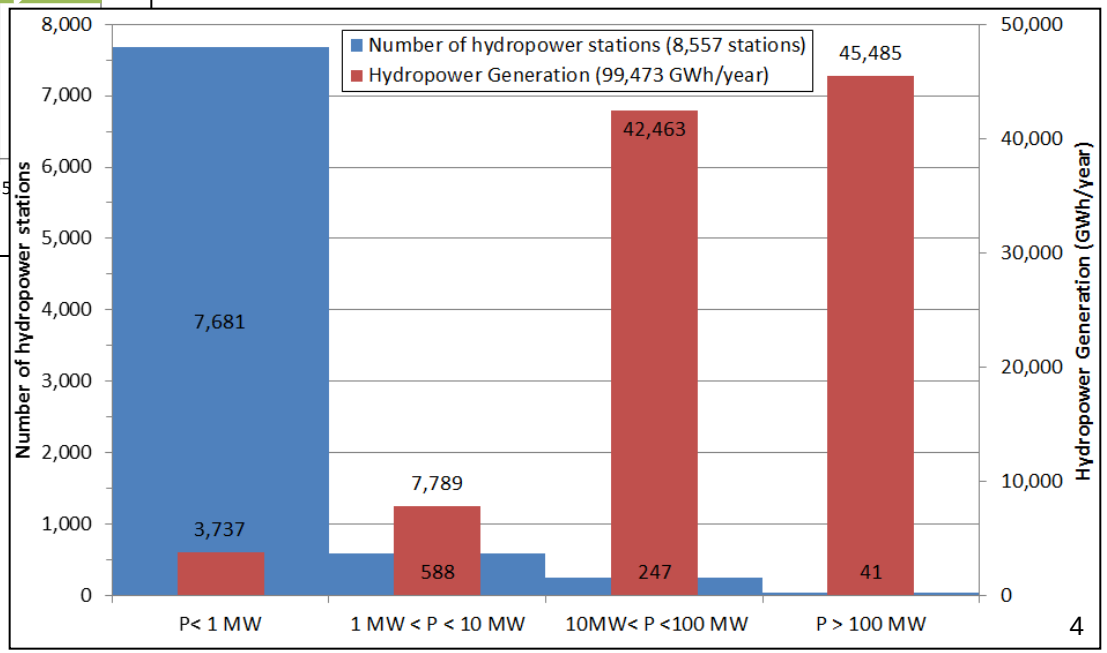


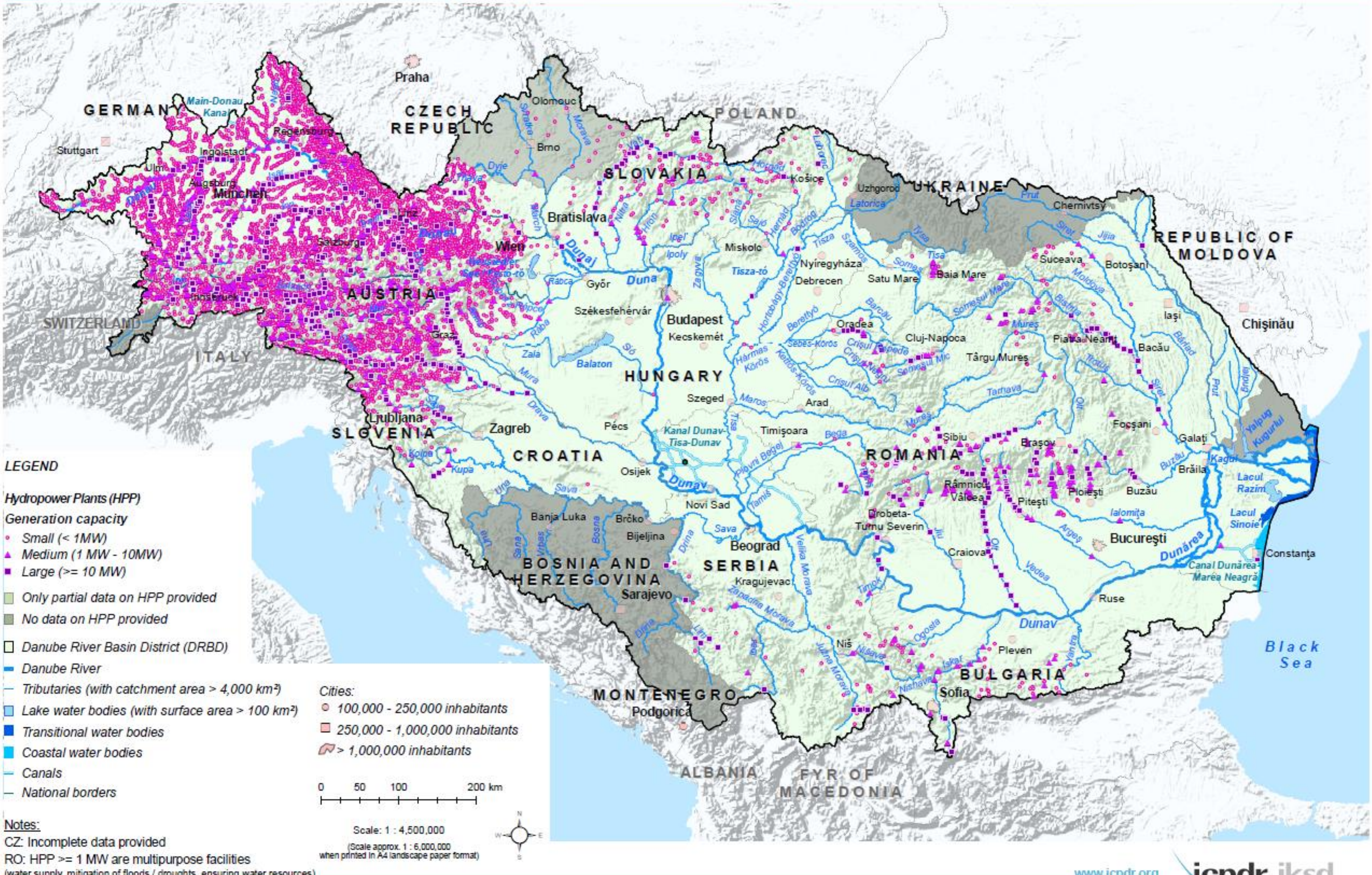
Planned **increase** of share of **renewable energy** in all Danube countries

Integration of other forms of RES (i.e. wind and solar)



Current generation: **3.4%** of facilities **larger 10MW produce 88.4% of electricity** from hydropower

Danube River Basin District: Hydropower Plants (HPP)



This ICPDR product is based on national information provided by Contracting Parties to the ICPDR (AT, BA, BG, CZ, DE, HR, HU, MD, RO, RS, SI, SK, UA). National borders data provided by the Contracting Parties to the ICPDR and CH was used; ESRI data was used for national borders of AL, ME, MK; Shuttle Radar Topography Mission (SRTM) from USGS Seamless Data Distribution System was used as topographic layer; Data from the European Commission (Joint Research Center) was used for the outer border of the DRBD of AL, IT, ME and PL. Data on HPP<1MW for Bavaria was derived from Energie-Atlas Bayern 2.0: http://www.energieatlas.bayern.de

AT data provided by: IWHW BOKU Habersack et al. (2012)
Input data: HAÖ (2007), Federal states of Austria (2010/2011)
Hydropower operators (2010-2012)

Produced by: ICPDR, Vienna, June 2014

What is the issue?

Impacts of hydropower

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Altered flow regime

Altered sediment dynamics

Ecological impacts

Impacts

Why should we care ?

- Environmental protection and biodiversity **conservation issues**
- Negative impacts of hydropower generation have led to **rather negative reception of new hydropower 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 **already existing facilities** to meet requirements of EU environmental legislation - costs (much) higher afterwards compared to initial consideration
- **Security for investors and legal compliance** with existing legislation

Renewable Energy and Environment

Legal framework

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Ambitious EU legislation for energy + water

Energy Community

RES-e European Renewable Energy Directive 2009/28/EC	WFD EU Water Framework Directive 2000/60/EC
Objectives: to **increase share of energy from renewable sources** with target figures for 2020 for each state	**Objectives:** **good ecological status** of water bodies
States set national targets + decide on strategy; e.g. by targets for HP	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

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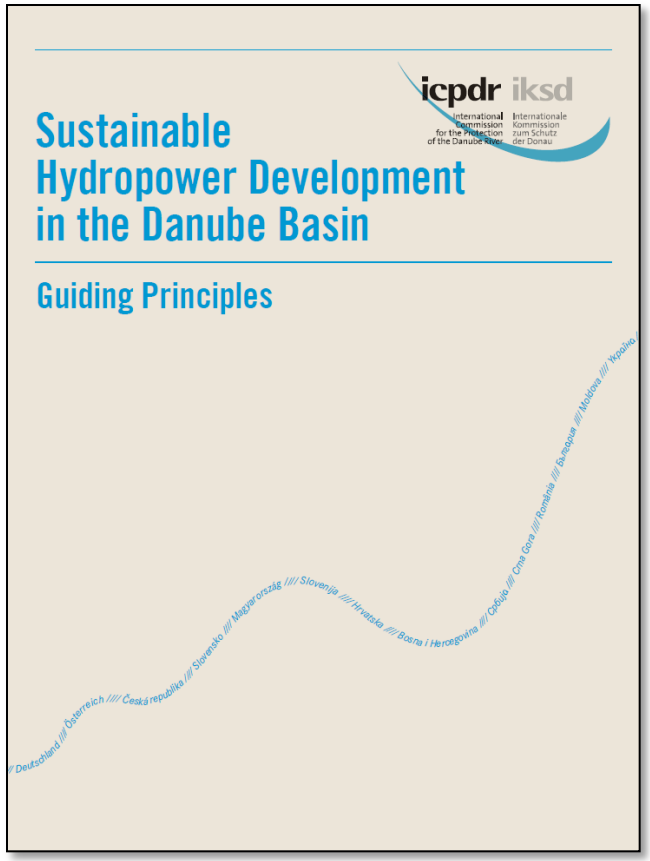
- **Political mandate** to develop „**Guiding Principles** on Sustainable Hydropower Development in the Danube Basin“
- **Process launched** in 2011
- **Broad participative process**: Involvement of administrations from Danube countries on energy and environment, hydropower sector and businesses, NGOs, scientific community, other relevant institutions
- **Adopted** in June 2013



SAVA RIVER BASIN COMMISSION

DANUBE ENVIRONMENTAL FORUM DEF

VGB

IAD

WWF

Energy Community

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ESHA

CARPATHIAN CONVENTION

INTERNATIONAL HYDROPOWER ASSOCIATION IHA

Response Danube

Hydropower Guiding Principles

- Recommendations based on **EU legislation & EU policies**
- Strike for balance, represent **state of the art** in Europe
- 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

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. other locations for projects!)
  - All practicable mitigation measures taken to minimize negative effects
  - etc.
- Compliance with other relevant (environmental) legislation, i.e. Natura 2000, environmenal impact assessment, etc.

Strategic planning approach for new hydropower development

Two-level assessment

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

Favorable locations – “WHERE”

Technical solutions – “HOW”

Danube basin-wide framework

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

Not legally binding but serving as a guidance for national application

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

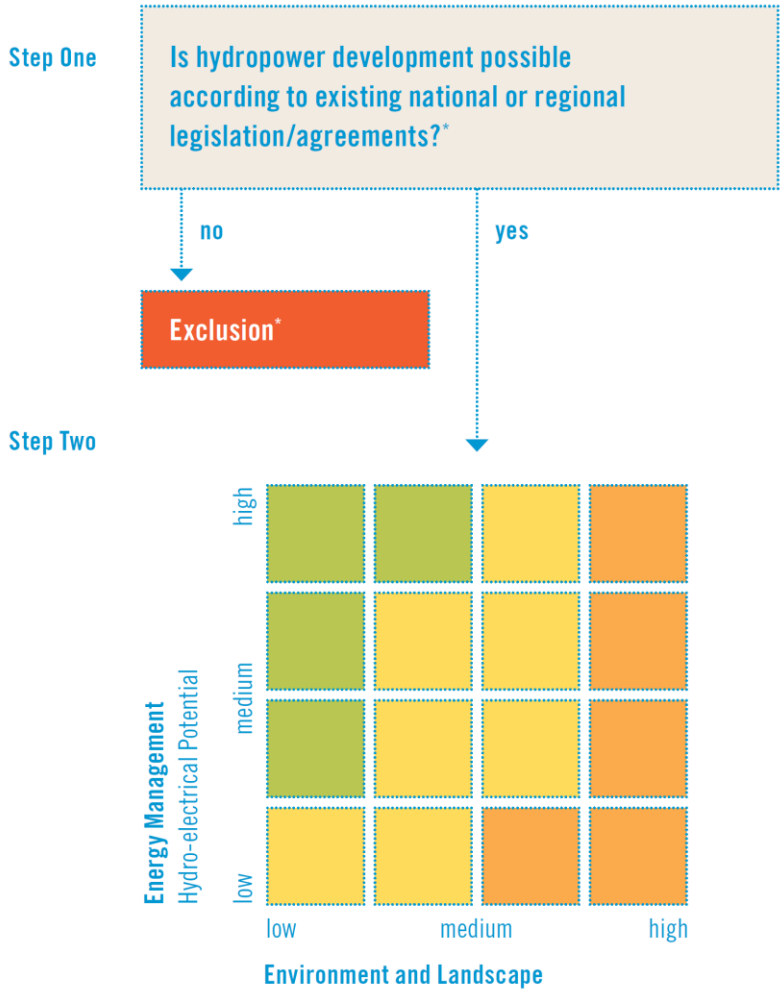
Interactions

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

Strategic planning for new hydropower
National/Regional level assessment



- Provides information on **suitability of river stretches** for hydropower development
- Assessment based on **different criteria**
- Weighing process with **stakeholder involvement**

Strategic planning for new hydropower
Sets of criteria for national/regional and project level

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Recommended list for national/regional criteria *TABLE 1*

National/Regional criteria	Description
Energy Management	
Hydro-electrical potential (theoretical or line Potential)	Product between quantity of flow and head [GWh/TWh]
Environment	
Naturalness	Status of river stretches/water body in relation to the deviation conditions regarding hydrology, morphology biological and sedi communities
Status of water body with regard to rarity and ecological value	Rarity of the river type, ecological status of a river stretch and
Specific ecological structure and function of the river stretch also with regard to the whole catchment/ sub-basin and in relation to ecosystem services	e.g. Particular habitats for sensitive/valuable fish species or ot in the riverine ecology (e.g. red list species)
Conservation areas and protected sites	e.g. Natura 2000 areas (Birds and Habitats Directive), Ramsar UNESCO Biosphere Reserves, National, Regional and Nature Pa
Landscape	
Naturalness	no significant anthropogenic impacts
Diversity	Intact terrestrial ecology with extensive use (e.g. small agriculture with low fertilizer use, sustainable fores
Landscape scenery	e.g. aesthetic values, high architectonic and historical quality
Recreation value	Use for soft tourism and recreation, such as organized campin
Cultural heritage	Historical buildings and villages or towns Traditional practice s
Spatial planning obligations	Legal regulation for different areas and uses

Recommended list for project-specific criteria *TABLE 2*

Project-specific criteria	Description
Energy Management	
Hydropower plant size	Installed capacity
Hydropower plant type	e.g. run-of-river, diversion, storage, pumped storage
Security of supply	Production and supply of energy (Auto supply),
Quality of supply	Production characteristics – base load/ peak load (storage option, pumping storage)
Contribution to climate protection	lower CO_2 emissions of the energy mix
Technical efficiency	Grid connection, potential use, size of plants
Environment and water management	
Ecological impacts of the project	Longitudinal/lateral/vertical connectivity; impacts on habitats and biota taking into account already existing impacts
Flood control	Protection of sites at flood risk; alteration of flow regime
Irrigation	Positive or negative effects on water availability for irrigation
Sediment management	Reservoir siltation, bedload transport, sediment contamination, plant design
Surface and groundwater quantity	Infiltration and exfiltration, minimum ecological flow,
Surface and groundwater quality	Nutrients, persistent organic substances, hazardous substances, thermal effects
Drinking water supply	Positive or negative effects on quality and service security
Bank protection and restoration	Foster erosive banks
Fisheries	Ensuring natural reproduction and fish migration across dams and residual water stretches
Effects of climate change	Changes in flow regime and impacts on economic feasibility of projects
Effects on water bodies already restored	water bodies restored by public money should not be effected again
Socio-economic criteria	
Conformity with local spatial planning	Compliance with the local regulations
Necessity of further infrastructure for construction and operation	Access, energy grids, etc.
Regional economic effects	Taxes, income for the public; investments in local economy, induced employment
Recreation, tourism	Potential positive and negative effects on tourism
Other socio-political considerations	depending on the local situation

Hydropower Guiding Principles
Conclusions in a nutshell

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- Ambitious **EU legislation** in place for energy and water – **challenge is implementation**
- 2-years elaboration process with active involvement of stakeholders - **balanced approached** with agreement of all countries and stakeholders
- Practical application of Guiding Principles provides **range of 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
- Inspiring **examples for all recommendations** collected (e.g. from Switzerland, Austria, Norway, Slovenia, …)

Relevance for Priority Area 2

EUSDR Action Plan & PA2 Roadmap Action Group 12-13

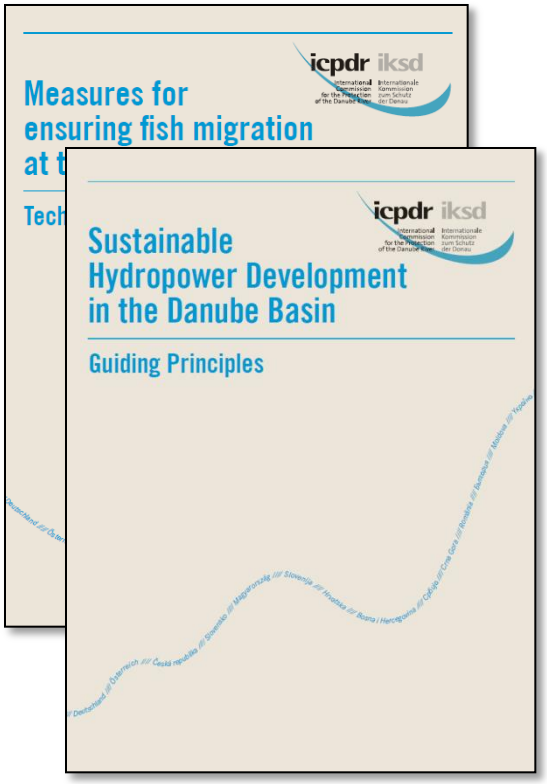
- Action - “To develop a comprehensive action plan for the sustainable development of the hydropower generation potential of the Danube River and its tributaries (e.g. Sava, Tisza and Mura Rivers)”*
- “To develop and set up pre planning mechanism for the allocation of suitable areas for new hydro power projects”**

* The plan would build on the achievements of the International Commission for the Protection of the Danube River (ICPDR) and its Danube River Basin Management Plan (in line with the Water Framework Directive)

** This pre planning mechanism would be fully in line with the 2010 Statement of Water Directors and the 2010 Danube Declaration adopted at the ministerial meeting in Vienna: http://www.icpdr.org/icpdr-files/15216

ICPDR - Planned next steps

- Incorporation of Guiding Principles and key results in **Danube River Basin Management Plan** according to EU WFD
- Further **facilitation of exchange** between relevant institutions (energy and environment) in countries / sector representatives / NGOs / scientific community
- Exchange of experiences in support for **practical application** of Hydropower Guiding Principles **at national level**
- **Potential projects** in support of practical application
- Organisation of **regular follow-up workshops** – autumn 2015 is currently under consideration



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Thank you for your kind attention!

More information available for download under

Hydropower Guiding Principles and other related documents:
http://www.icpdr.org/main/activities-projects/hydropower

EU CIS Guidance Documents: http://ec.europa.eu/environment/water/water-framework/facts_figures/guidance_docs_en.htm

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