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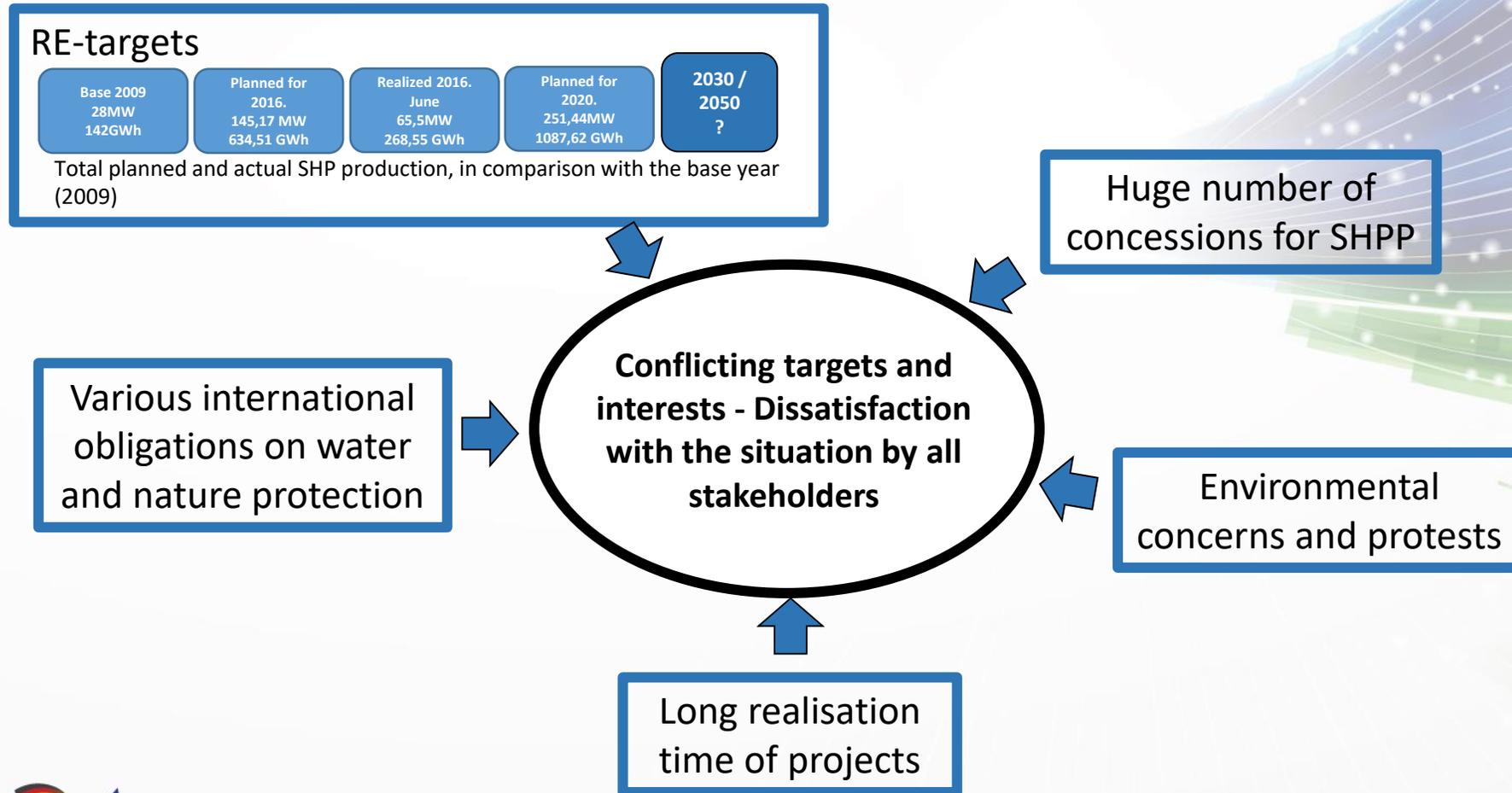
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STRATEGIC PLANNING APPROACH FOR HYDROPOWER DEVELOPMENT IN AUSTRIA

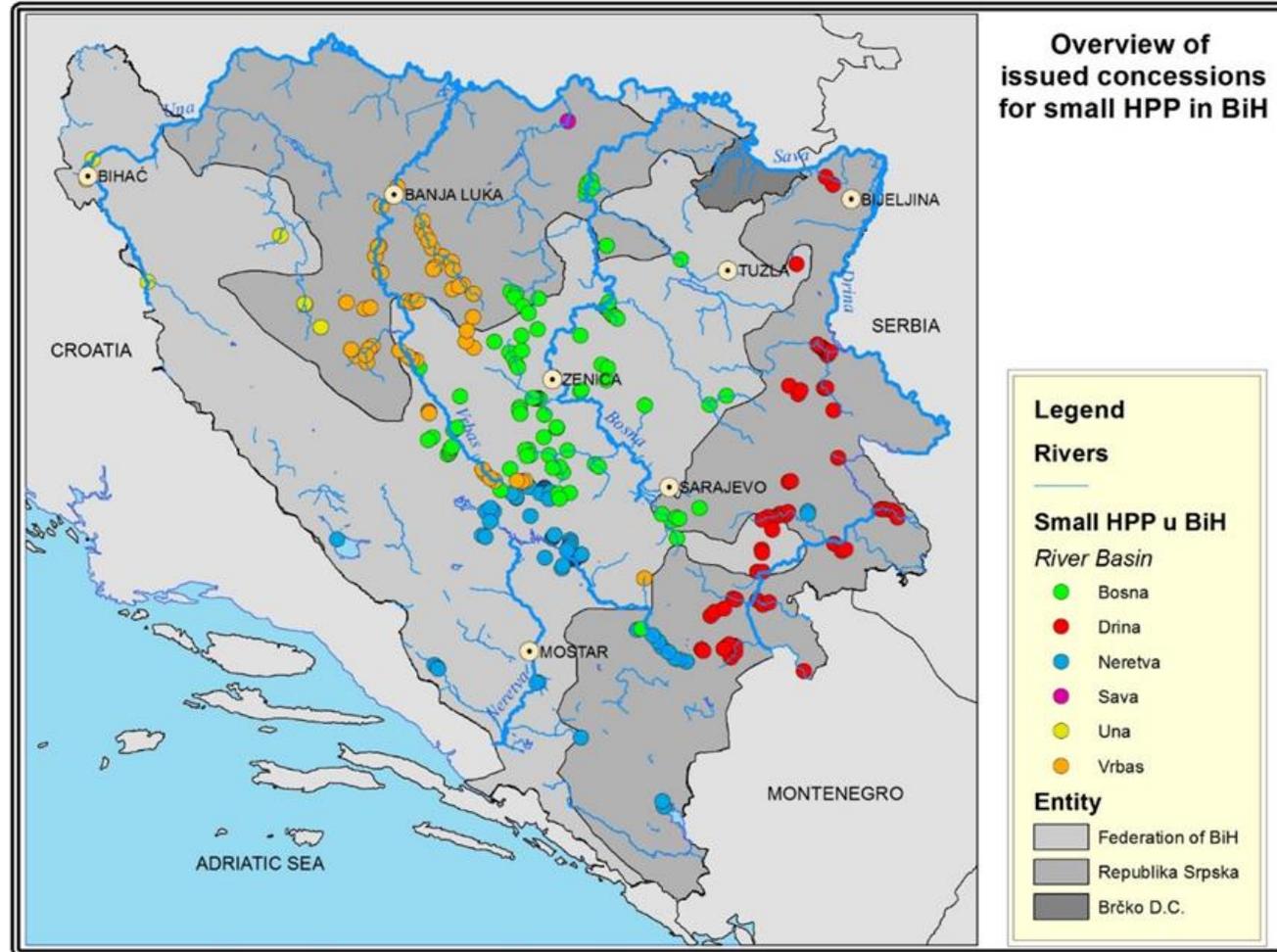
Lutz Jarczyński (GIZ)

Why do we organise this presentation and panel?



Map of allocated concessions

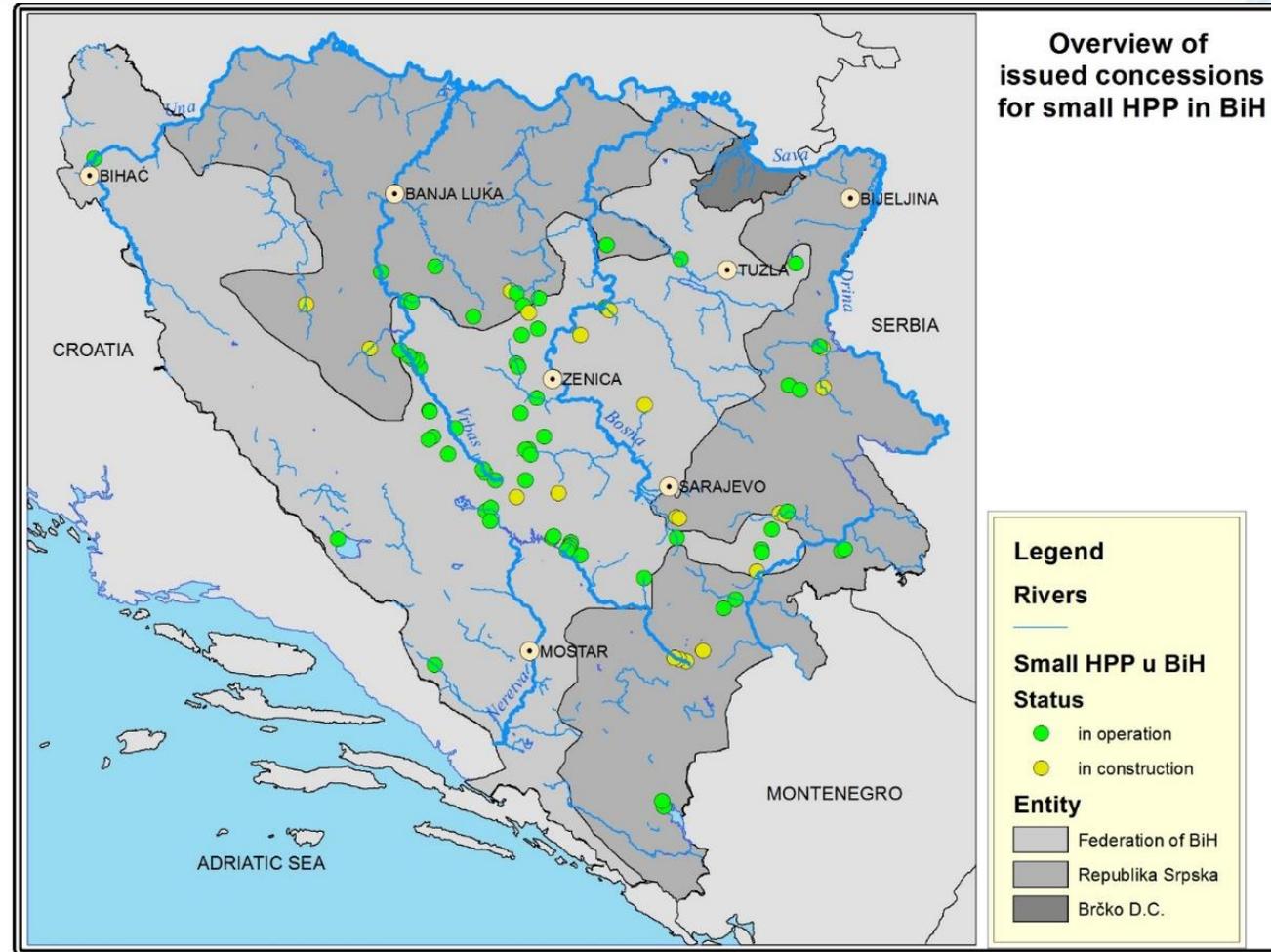
Allocated concessions		
BiH	FBiH	RS
282	173	109



Map of projects in operation and construction

SHPP in operation		
BiH	FBiH	RS
66	50	16

SHPP in construction		
BiH	FBiH	RS
20	7	13

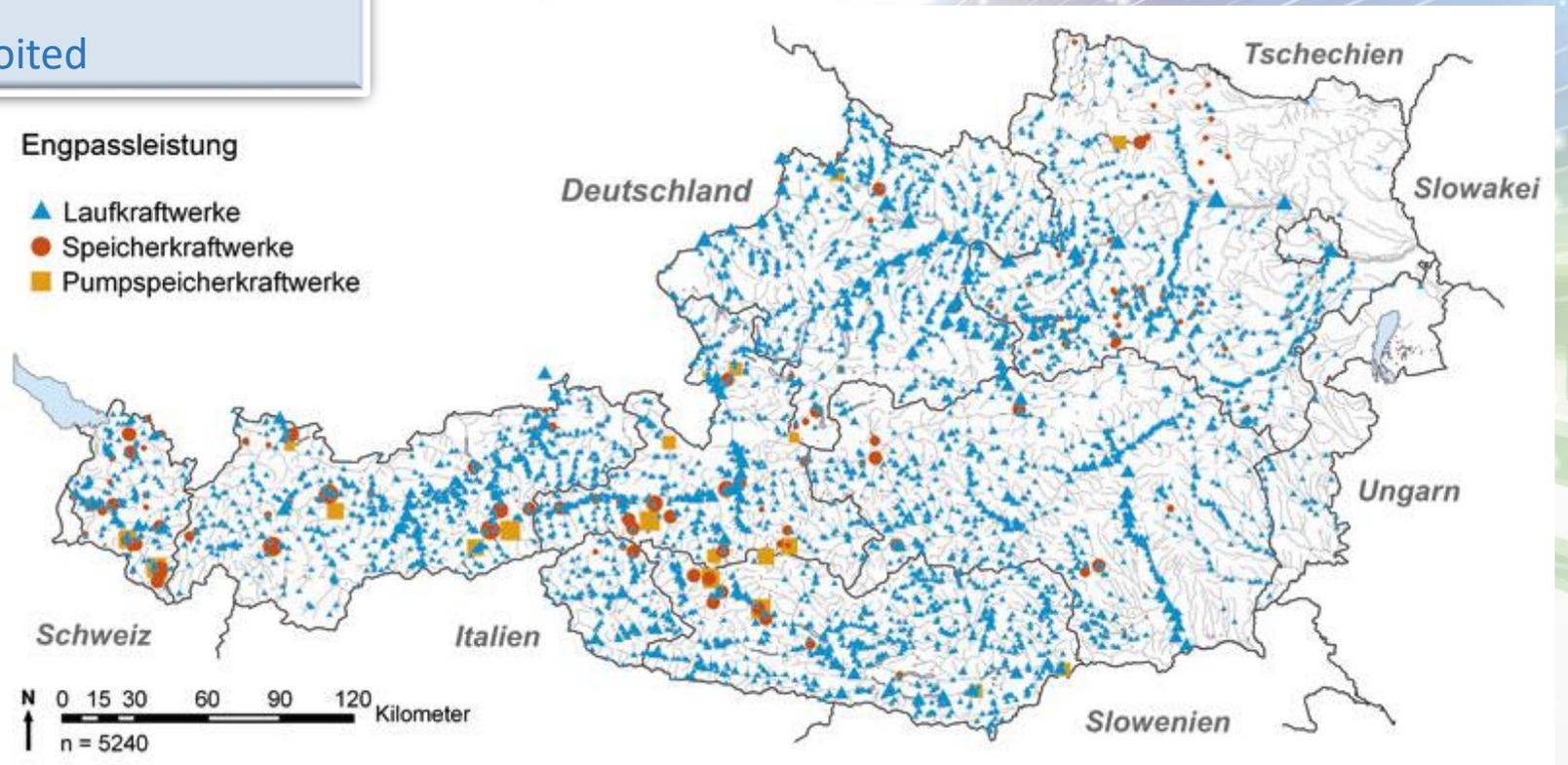


Hydropower in Austria - LONG TRADITION & EXPERTISE

2/3 of total national electricity production
60% of electricity demand
3/4 of hp potential already exploited

Ca. 5 000 hp Plants

> 10 MW: 156
1-10 MW: 225



EU GOALS TO BE MET

- **Increase of renewables to mitigate climate change**
(Renewable Energy Directive)
- **Ensure good ecological functioning of our rivers**
(Water Framework Directive)
- **Protect endangered species and sites**
(Fauna-Flora-Habitat Directive – Nature 2000)
- **EU biodiversity strategy 2020**



Balancing
conflicting
interests!



CIS POLICY PAPER (2007)

WFD & Hydromorphological pressures

Focus on hydropower, navigation and flood defence activities
Recommendations for better policy integration

4.1 Specific recommendations for hydropower

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.

(...)

CIS POLICY PAPER (2007)

WFD & Hydromorphological pressures

Focus on hydropower, navigation and flood defence activities
Recommendations for better policy integration

Policy Summary

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.

NEW HYDROPOWER DEVELOPMENT

CIS Policy paper on on hydropower WFD and Hydromorphological pressures (Hydropower, Navigation, Flood defence,) 2007

Transparent procedure for the selection of appropriate sites (i.e.) according to the following ranking:

1. Increase of efficiency at existing sites
2. Sites where a new project would not mean a deterioration
3. Sites where new projects have very low negative impacts on ecology compared to other sites

Need of strategic planning



WFD & Hydropower

CIS Workshop Berlin, 4/5 June 2007

Key conclusions

Instruments to promote hydropower and to improve water status

10. The workshop participants recognised the advantages of pre-planning mechanisms to facilitate the (proper location) identification of suitable areas for new hydropower projects. These pre-planning mechanisms should take into account WFD and other environmental criteria as well as socioeconomic aspects, including other water uses. The use of such preplanning systems could assist the authorisation process to be reduced and implemented faster, provided that the criteria of WFD Art. 4.7 are met.

11. At least 3 categories of areas could be distinguished for pre-planning: suitable, less favourable and non-favourable areas. These categories should be identified with the involvement of all stakeholders based on transparent criteria, they should be monitored and revised within a period of time.

2007: Discussion on pre-planning started in ...



2009: National River Basin Management Plan

AUSTRIAN STRATEGY FOR SUSTAINABLE HYDROPOWER DEVELOPMENT

Statutory „green standards“

Obligatory mitigation measures

- Fish pass
- Ecological flow



E-flow

Strategic preplanning instruments

- to support the achievement of conflicting goals
- to support balancing conflicting interests

National River Basin Management Plan 2009

PREPLANNING FOR AN ENVIRONMENT-COMPATIBLE HYDROPOWER DEVELOPMENT

Decision support tool (procedure, criteria) for balancing interest in case that serious impact on water ecology is expected (deterioration of ecological status - WFD, Art. 4.7 test)

Strategic planning on regional level for appropriate site selection (cumulative effects, synergies, ...)

Transparent, reproducible decisions

National River Basin Management Plan 2009



DECISION SUPPORT TOOL

General Principle: (National River Basin Management Plan 2009)

The higher the ecological value of a river stretch to be impacted by hydropower the higher the energy output has to be”

AUSTRIAN CATALOGUE FOR WATER PROTECTING RIVERS – USING RIVERS

**Criteria for the assessment of a sustainable hydropower development
(Jan 2012) rating projects and sites**

Developed by the Ministry for Water Management

- in co-operation with the 9 regional governments
- involvement of all stakeholders (Ministry of Economic Affairs, energy sector, NGOs, ...)



Criteria Catalogue for new hydropower projects

3 FIELDS OF PUBLIC INTERESTS

Energy management

4 criteria:

- security of supply
- quality of supply
- contribution to climate change mitig.
- technical efficiency

Ecology

4 criteria:

- naturalness
- rarity
- specific ecol. function in catchment
- dimension of negative effects

Other water management interests

- flood control
- sediment management
- groundwater quantity
- Groundwater quality
- drinking water supply
- surface water quality
- recreation/ tourism/ fisheries, ...
- effects on water bodies already restored

several **indicators** for every single criterion

3 level value rating
(high - medium - low)

5 levels of effects

++ very positive
+ positive
0 indifferent
- negative
-- very negative

Austrian Criteria Catalogue – Indicator rating

Crit. No.	Criterion	Ind. No.	Indicator	Parameter	Dimension	low	medium	high	Weight allocation
EC 1	Security of Supply	EC 1-1-R	Amount of electricity production incl. effects on production of other plants	Standard production/output (RAV)	GW/a	< 5	5 - 50	> 50	100%
		EC 1-2-R	Self supply (island operation)	-	yes/no	"yes" raises the rating of indicator EC - 1-1-R by one level			
EC 2	Quality of Supply	EK 2-1-R	Generation characteristics (with special regard to winter production)	Ratio of standard production Dec + Jan (average) to standard production Jan-Dec (average)	1				
EC 3	Con...								

Ecological criteria (2)

No nature protection criteria
 as this is in the legal responsibility of provincial governments
 → Might be taken into account in regional planning

Rating	Criterion WK 2: E...
++	Signifikant positive... ist zu verstehen, da... beigeführt wird. Da... fährungen von we... und ein Sohldurchs... hin-der. Maßnahm... tung werden dadur... durchtransports bei Einstößen ohne zu einer gravierenden Hochwasserverschärfung zu führen.
+	Positive Beeinflussung des Feststoffhaushaltes verglichen mit dem IST-Zustand. Damit kommt es zu einer Reduktion der Eintiefung der Flusssohle, die zu Schäden an Böschungen und Ufersicherungen geführt hat bzw. mittelfristig Schäden erwarten lässt. Geschiebeeinstöße und Anlandungen verursachen keine erhebliche Hochwasserverschärfung.
0	Keine Änderungen des Feststoffhaushaltes, die absehbare Schäden an Ufersicherungen oder technischen Bauwerken im und in Flussnähe verursachen.
-	Negative Beeinflussung des Feststoffhaushaltes (z.B. Verringerung des Austrags aus Stauhaltung im Vergleich zum Eintrag) und damit geringe Verschärfung der Eintiefung der Flusssohle mit Schädigung oder Gefährdung von Böschungen und Ufern. Förderung von Anlandungen und Geschiebeeinstößen, die negative Auswirkungen auf den Hochwasserabfluss haben.
--	Signifikant negative Beeinflussung des Feststoffhaushaltes (wesentliche Verringerung des Austrags aus Stauhaltungen im Vergleich zum Eintrag) und damit Verschärfung der Eintiefung der Flusssohle mit der Folge einer absehend massiven Schädigung oder Gefährdung von Bauwerken wie Brückentauern oder Ufermauern Infrastruktureinrichtungen oder Förderung eines drohenden Sohldurchschlags. Förderung von Geschiebeanlandungen und Geschiebeeinstößen mit gravierend negativen Auswirkungen auf den Hochwasserabfluss. Gravierend negative Auswirkungen auf bestehende oder in Aussicht genommene Maßnahmen zur Verbesserung des Feststoffhaushaltes oder Regulierungen von Gewässern.

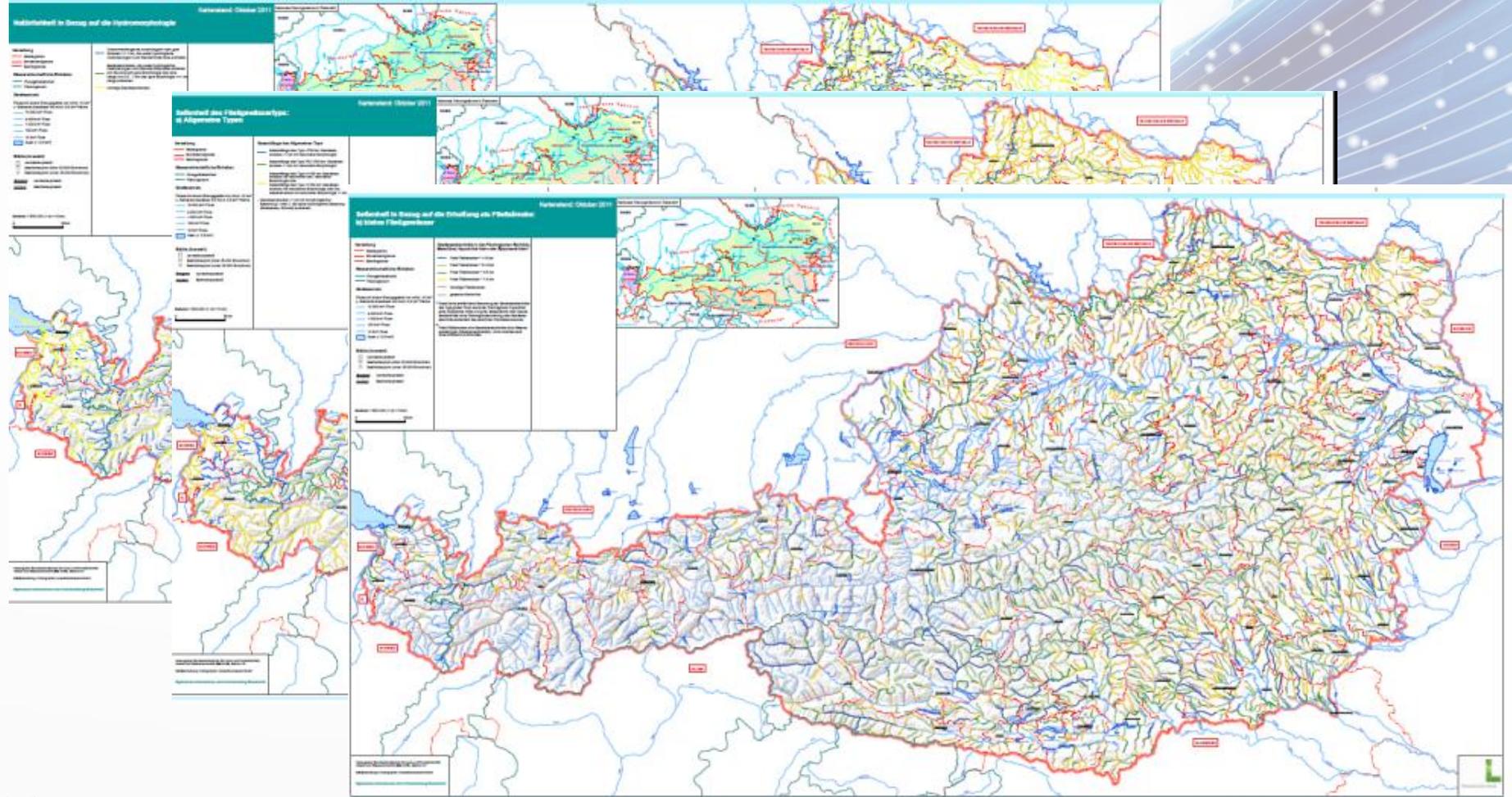
ÖK 3-5	Functionality as ecosystem	Endangered ecological functionality	MUNGI > 100 l	MUNGI 50 - 100 l	Small water bodies MUNGI < 50 l/s (or < 10 km² catchment area in case that MUNGI is unknown)	
ÖK 4	ÖK 4-1	longitudinal effect	Length of effect	Only one water body is negatively affected (3-4 km in small rivers, 7-8 km in large rivers)	Some water bodies are affected	negative effects exceeding water bodies directly concerned in the long run
	ÖK 4-2	Lateral effect	Amount of lateral effect with special regard to disconnection of wetlands and floodplains	minor negative effects (i.e. small reduction of frequency being connected)	Significant negative effects (i.e. no total abscission, but significant reduction of frequency being connected)	intense negative effects (i.e. further/additional hydrological abscission)

Austrian Criteria Catalogue for new hydropower projects

EXAMPLE

	Value rating		
	low	medium	high
Energy Management			
Security of supply:			
<ul style="list-style-type: none"> Amount of electr.production (GWh/a) 	< 5	5-50	> 50
Ecology			
Naturalness			
<ul style="list-style-type: none"> Status of ecological integrity - ecol.status 	high	good	less than good
Rarity			
<ul style="list-style-type: none"> Type Total length of type in near natural morphology 	>1.000 km	750-1.000 km	< 750 km
<ul style="list-style-type: none"> Share of river km left in good or high ecological status 	> 50% high	20-50% high	< 20% high or < 33% good / better

Austrian Criteria Catalogue Ecological indicators /maps

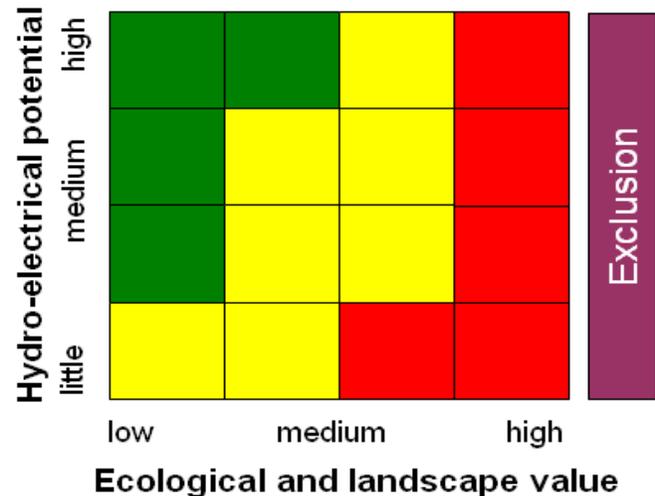


STRATEGIC PLANNING - Alpine Convention

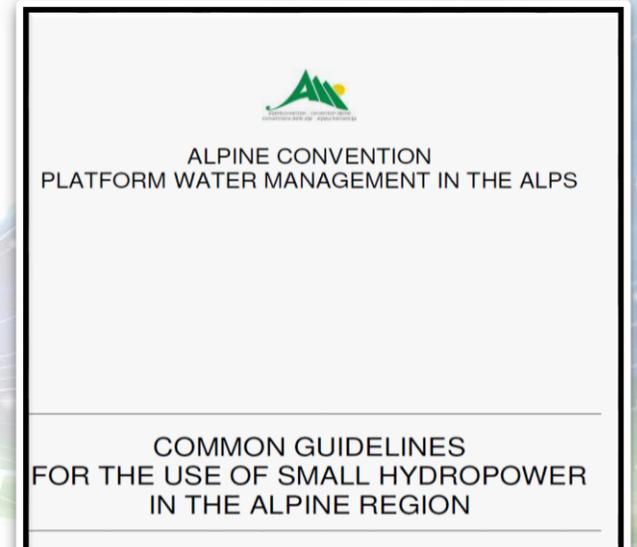
Common guidelines for the use of small hydropower in the alpine region (2011)

To enhance share of renewable energy and to protect our waters by defining:

- favorable
- less favourable
- non favourable sites for hydropower use
- (exclusion zones)

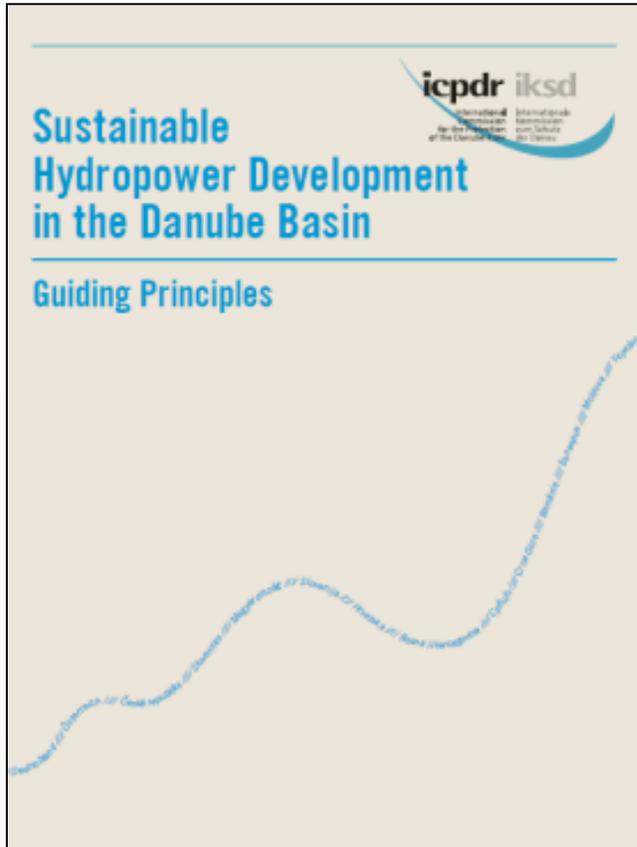


FAVORABLE	LESS-FAVORABLE	NON-FAVORABLE	EXCLUSION
for hydro-electrical exploitation	for hydro-electrical exploitation	for hydro-electrical exploitation. Strong interest for conservation	e.g. SHP forbidden by law
complying with the legal environmental (and other) standards, construction of SHPs in general possible	additional aspects and in-depth assessment weighing all relevant criteria indispensable Next to complying with legal environmental standards, possibly further or stricter requirements may be necessary	SHPs possible only in exceptional cases (e.g. auto-supply)	No hydro-electrical exploitation possible since protected areas where any interventions are forbidden by law

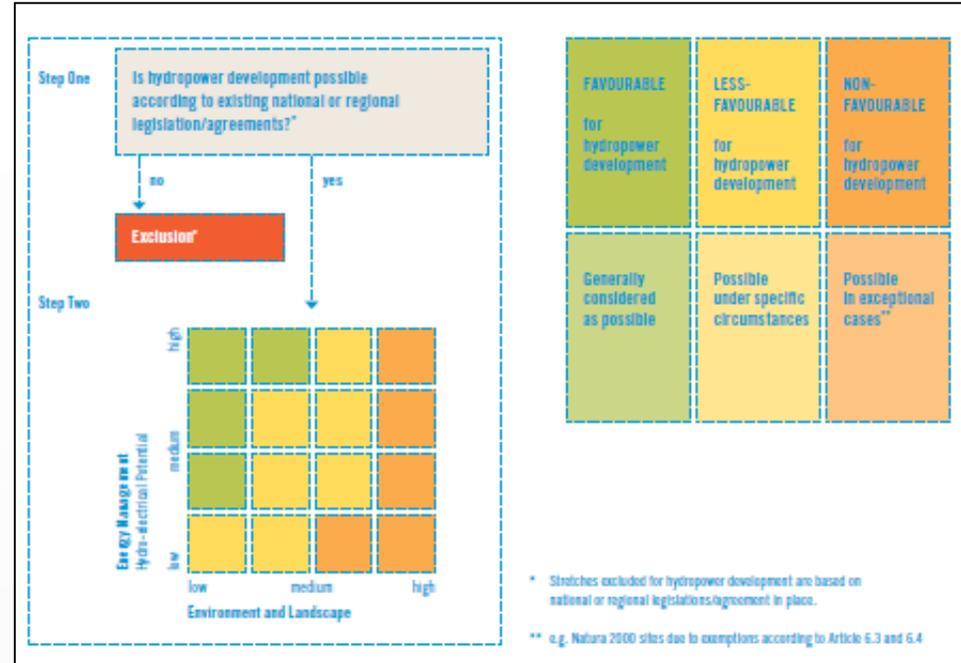


STRATEGIC PLANNING – DANUBE BASIN

International Commission for the Protection of the Danube River
Guiding principles for Sustainable Hydropower Development, 2013



Selection of favourable, less favourable and non favourable sites for hydropower development



Definition of river stretches which should be protected from hydropower use

STRATEGIC PLANNING TO SUPPORT APPROPRIATE SITE SELECTION

Initiated by

- Provincial government (water management planning body)
- Hydropower company

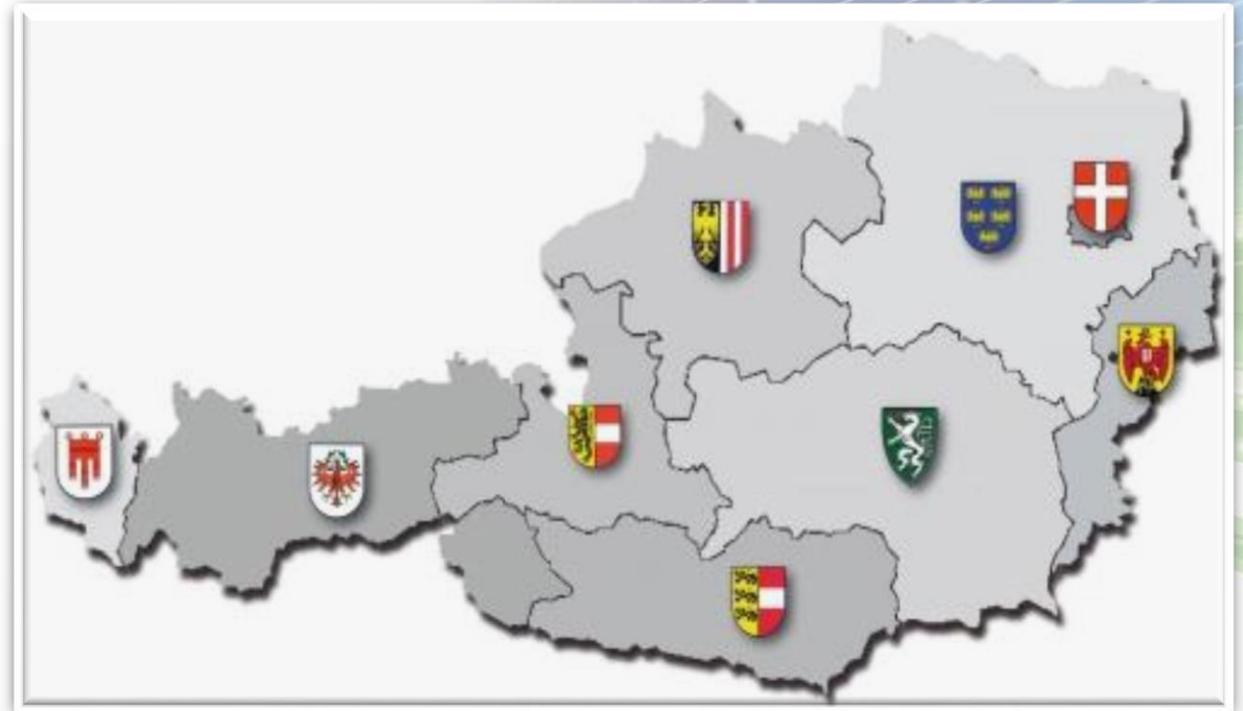
2 approaches:

- Focus on rivers with high (ecological) value to be preserved
- Designation for hydropower use

Intensive discussion with all relevant stakeholders!

Plans underwent SEA !

Legally fixed



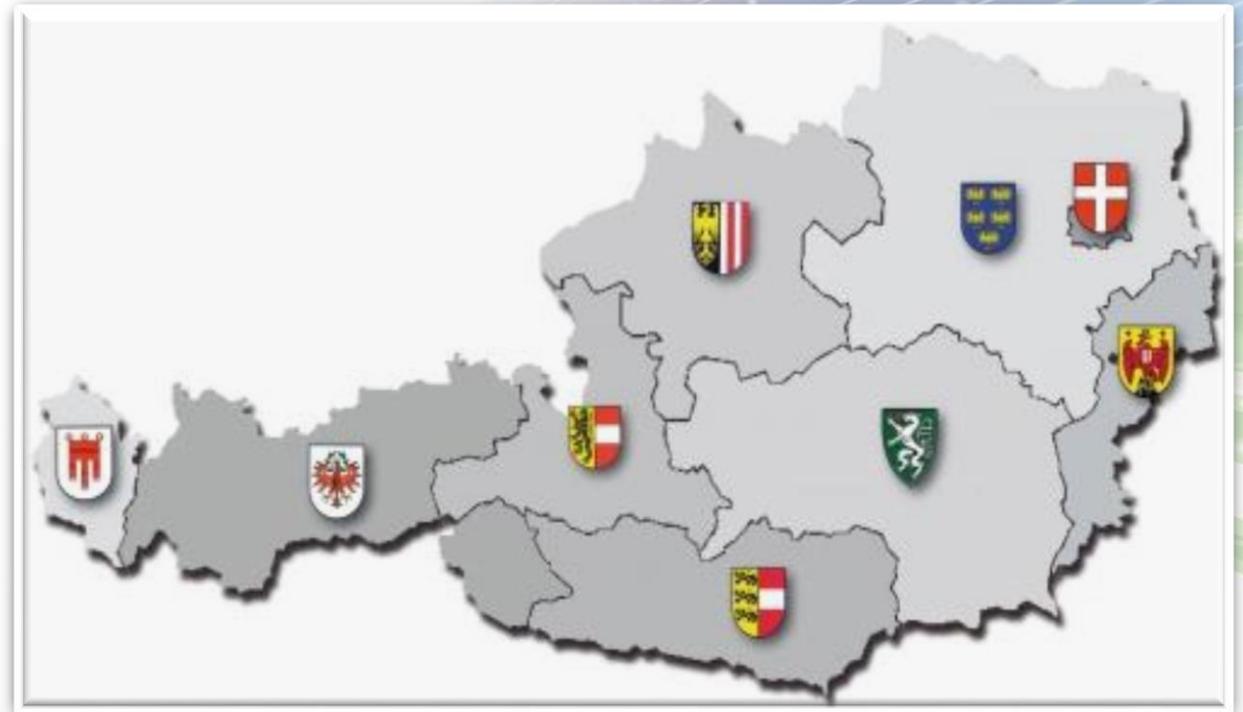
STRATEGIC PLANNING TO SUPPORT APPROPRIATE SITE SELECTION

Based on Austrian Criteria Catalogue
(fitted to region specific conditions including nature protection criteria)

Basic Studies:

- **Unexploited hydroelectric potential**
(technically /economically feasible)
- **Collection of ecological data**
- **Collection of other relevant interests /uses**

Thematic maps!



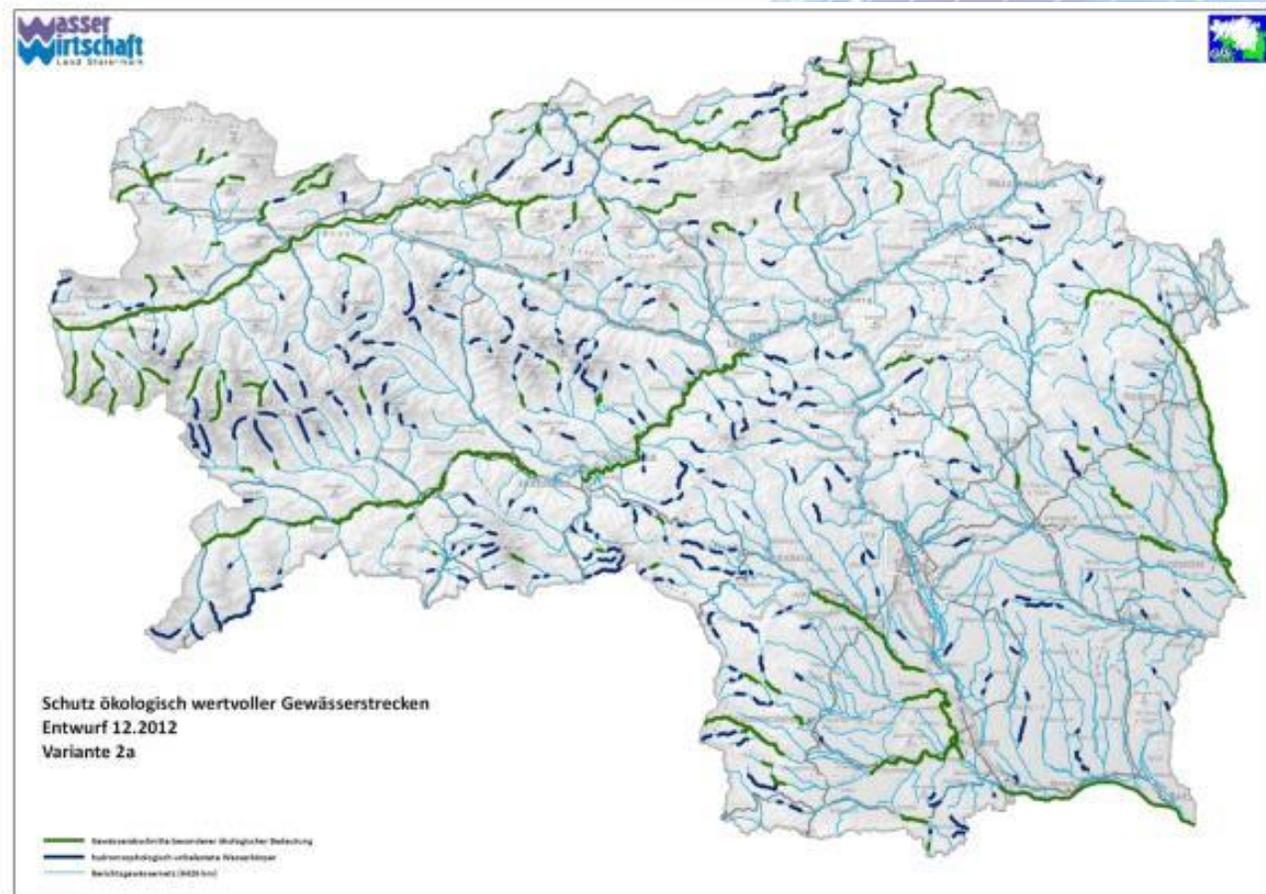
Strategic planning - Province of Styria

Criteria mainly based on Austrian Criteria Catalogue
+ Nature protection aspects

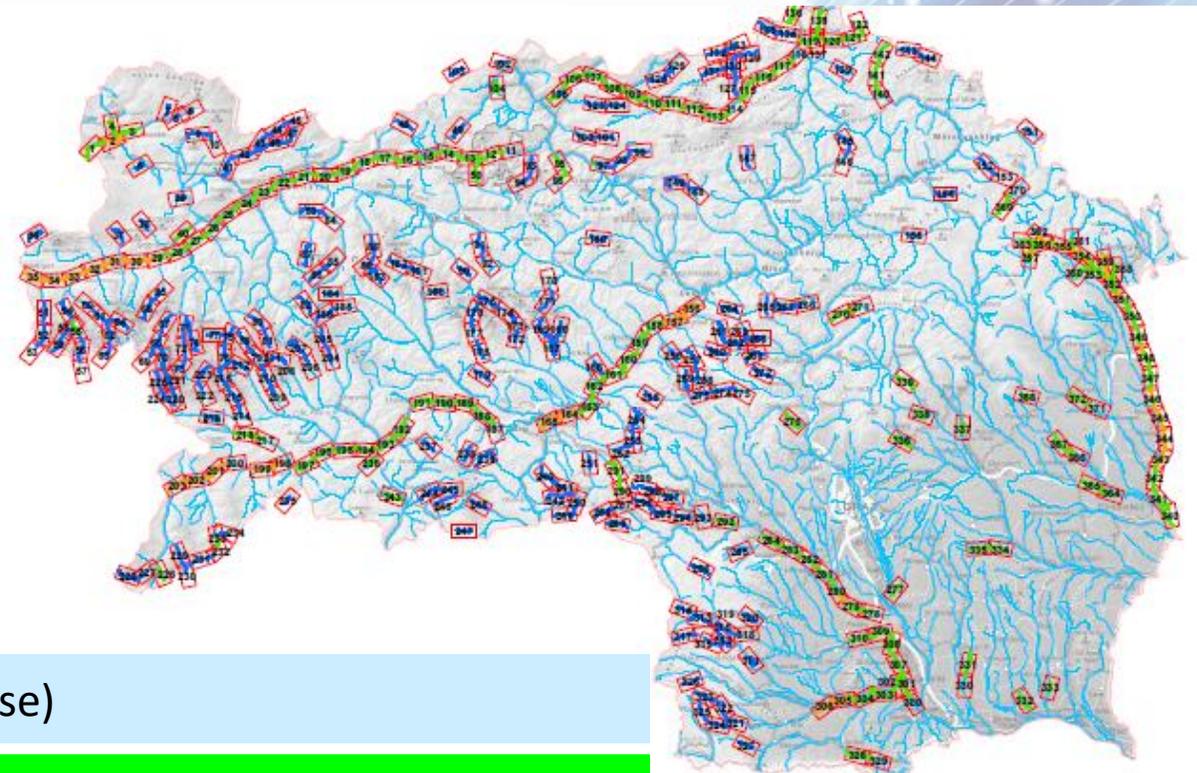
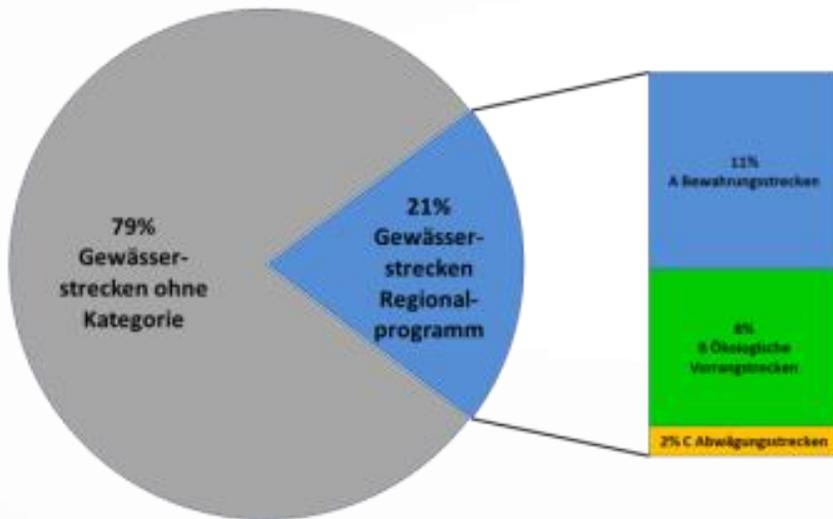
**Identification of river stretches
of „high ecological importance“**

Evaluation of hydropower potential in Styria

- Unexploited hydropower potential
(technically feasible)
- Styrian Renewables Objective for Hydropower



Regional Programme for the Protection of Rivers (Ordinance, May 2015)



A: Priority for preservation (total protection from any use)

B: Priority for ecology (ecologically important) – significantly restricted use

C: Weighting sites (high electricity potential)

Hydropower use possible but no Art. 4.7 exemption allowed!

BENEFITS FOR STAKEHOLDERS

Ministries and Authorities

- Clear overview of suitable river stretches for hydropower development
- Simplified permitting processes (time and resource efficient)
- Integrated planning, taking into account international obligations

Power utilities and investors

- Clarity on potential locations
- No waste of budget for planning documents on sites, which cannot be realised
- Planning security

NGOs and other interest groups

- Involvement in decision making preparation
- Protection of nature and river stretches, where is a high ecological value

LESSONS LEARNT ON PROCESS

- Early involvement of all relevant stakeholder „round table“
- Moderated process (mediator)
- Carving out the advantages for all parties
- 1st step: agreement procedure, criteria & relevant parameter
- Selection of parameter based on available information/data
- Prioritisation might be helpful
- 2nd step: strategic planning
- Including other relevant interests (e.g. tourism, flood defense, recreation, social aspects, ...) - no black/white discussion!
- Clarification of role of hydropower within renewable (specific targets)
- Need of political commitment



**Thank you
for your attention!**



Austrian Criteria Catalogue for new hydropower projects

Rating ecological value of river stretches

Example:

	Low	Medium	High
Naturalness			
<ul style="list-style-type: none"> Status of ecological integrity – ecol.status 	high	good	less than good
Rarity			
<ul style="list-style-type: none"> Type (Total length of type) 	>1.000 km	750-1.000 km	< 750 km with near natural morphology
<ul style="list-style-type: none"> Share of river km left in good or high status 	> 50% high	20-50% high	< 20% high status or < 33% in good / better
Specific ecol. function for the catchment area			
<ul style="list-style-type: none"> Essential habitat for sensitive fish species 	-	-	Migration corridor for medium distance migrators, spawning areas
<ul style="list-style-type: none"> Functionality as ecosystem 	MJNQ _t > 100 l	50-100l	< 50 l
Dimension of negative effects of the project			
<ul style="list-style-type: none"> Length of negative longitudinal effect 	Only one water body (~3/8 km)	some WBs	exceeding direct affected water bodies in the long run