Strategic planning approach for hydropower development in Austria

Dr. Jürgen Neubarth* :: Sarajevo :: November 8th, 2017

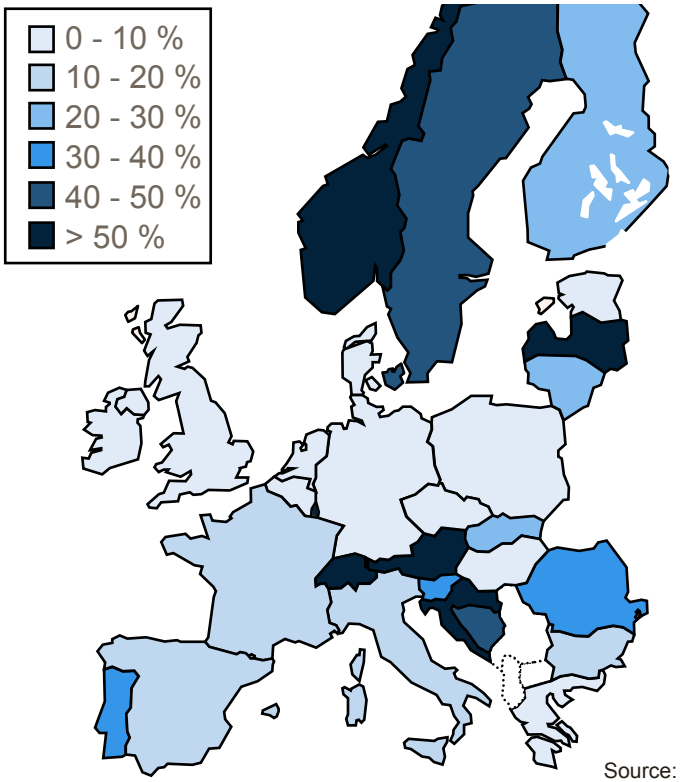
* e3 consult, Austria

Agenda

1. Hydropower in Austria at a glance
2. Strategic planning approach for hydropower development
3. The Austrian Water Catalogue
4. Lessons learnt so far

The role of hydropower in European countries

Share of hydro in generation 2010

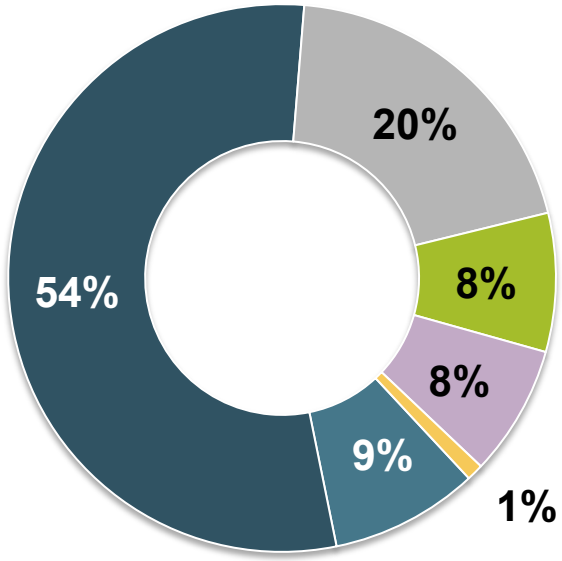


Source: Eurostat

- 130,000 MW hydropower and 30,000 MW pumped storage capacity are installed in EU 28
- About 12% of annual electricity generation in EU 28 from hydropower
- On a country level share of hydropower varies between 0% (e.g. Hungary) and nearly 100% (Norway)
- From an economic perspective the additional hydropower potential in Europe accounts to some 300 TWh/a
- The largest potentials for hydropower expansion are in South-East Europe

Due to the favorable geographical conditions the use of hydropower has a long tradition in Austrian

Austrian electricity generation 2016

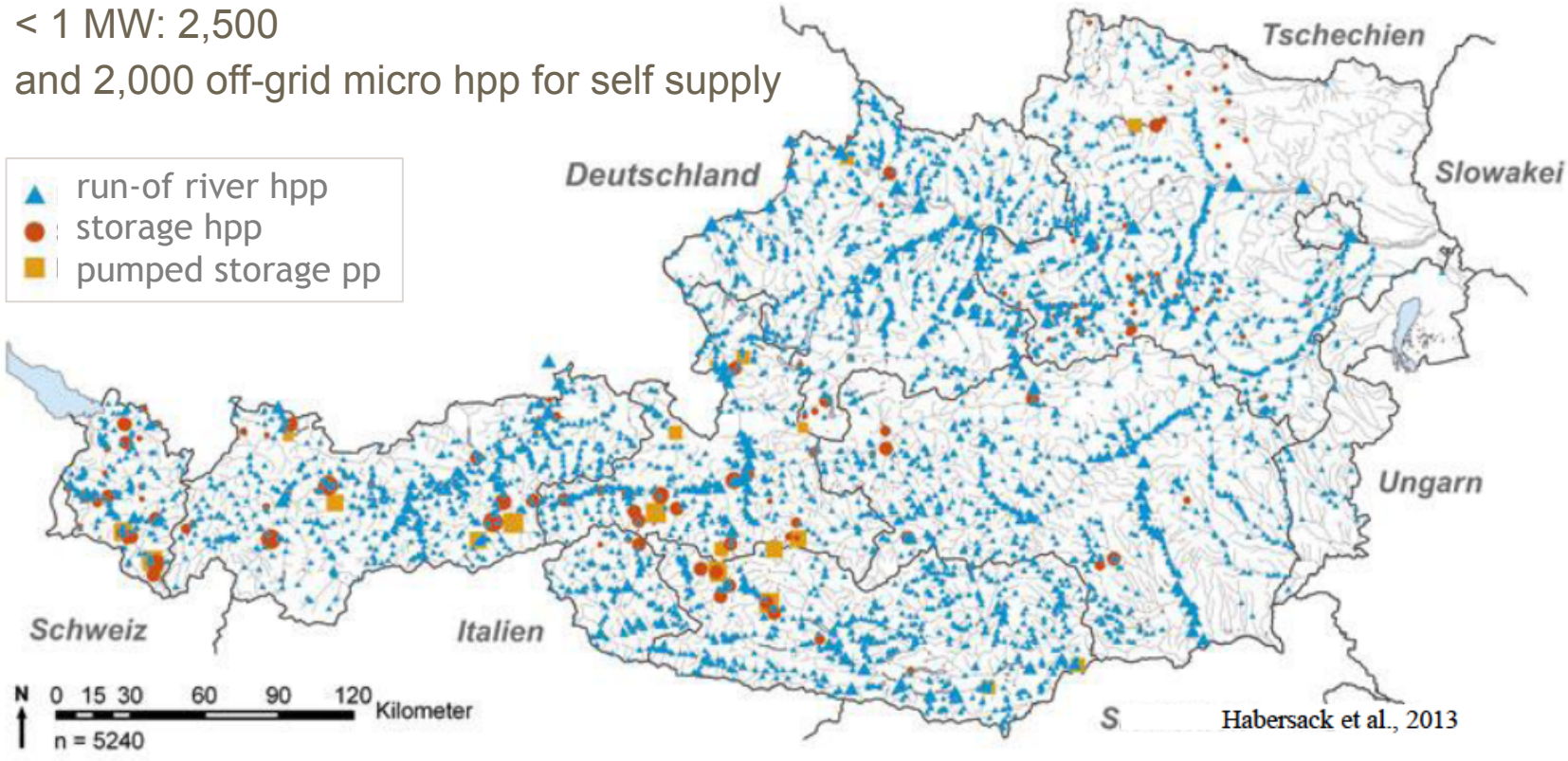


Source: E-Control

- On average 43 TWh/a electricity generation from hydropower
- Domestic hydropower contributes 2/3 to annual electricity production and 60% to annual electricity demand, respectively
- In total 14 GW hydropower installed, of which
  - 5.6 GW run-of river
  - 3.6 GW hydro
  - 4,4 GW combined storage and pumped storage
- Almost 5 GW of new capacities in construction and development

More than 5,000 hydropower plants are already in operation in Austria

> 10 MW: 156
1-10 MW: 225
< 1 MW: 2,500
and 2,000 off-grid micro hpp for self supply



Austria pursues a permitting and not licensing or concession based system for new hydropower plants

- Water bodies are „owned“ by the Austrian state, every legal and natural person, respectively, can apply for a permit to build a hydropower plant
- Legal Basis: National Water Act (responsibility of Water Management Ministry)
- Permit is given by responsible Water Authorities
  - County level for hpp < 500 kW
  - Provincial governments for hpp > 500 kW
  - Ministry for Agriculture, Forestry, Environment & Water Management for specified large hpp
- Duration of permit: 90 years (small hpp: 30 - 90 years)
- No water tax or fee

Source: Dr. Veronika Koller-Kreimel (BMLFUW)

European goals set the boundary conditions also for future hydropower development in Austria

- **Increase of renewables** to mitigate climate change (EU Renewable Energy Directive)
- **Protection** (good ecological functioning) and **sustainable use of waters** (Water Framework Directive)
- **Protect endangered species and sites** (Fauna-Flora-Habitat Directive – Nature 2000 sites)
- Increase **biodiversity** (Biodiversity Strategy 2020)

→ **Challenge** to balance conflicting interests!

Source: Dr. Veronika Koller-Kreimel (BMLFUW)

Different aspects are considered in Austria's strategy for a sustainable hydropower development

- **Green standards to minimize impacts on aquatic ecology**
  Mandatory mitigation measures for new and existing hpp legally fixed (e.g. ecological continuity and flow, hydro peaking)
- **Boost hidden technical and ecological potentials in existing hpp**
  Upgrading technical efficiency at existing plants and improving aquatic ecology at the same time
- **Strategic planning for appropriate site selection**
  Water catalogue and regional planning to balance conflicting interests
- **Research and innovation**
  Increase knowledge, find tailor-made solutions and minimize impacts on hydropower use

Source: Dr. Veronika Koller-Kreimel (BMLFUW)

A strategic planning approach delivers a broad range of potential benefits

- **Electricity sector**
  - Streamlined authorization processes
  - Improvement of predictability and upfront information, where authorization is likely
- **Environmental sector**
  - Transparency
  - Involvement in decision making process
  - Protection of sensitive and high value river stretches
- **Authorities**
  - Increase of security for legal compliance
  - Balanced approaches with involvement of actors at an early stage

Source: Dr. Veronika Koller-Kreimel (BMLFUW)

The Austrian Water Catalogue is a decision support tool to support the rating of projects and sites

- **Water catalogue shall support**
  - permission process of projects with negative impacts on water bodies (WFD 4.7) – i.e. weighing public interests
  - assessment of better environmental options
  - further strategic planning on regional level
- **Water Catalogue covers three fields of public interests**
  - Relevance for energy and water management
  - Ecological value of sites
  - Relevance for other water management aspects
- **General principle for weighing public interests:** The higher the ecological value of a river stretch the higher the energy output has to be!

Source: Dr. Veronika Koller-Kreimel (BMLFUW)

Expert and early stakeholder involvement were key for successful implementation of Austrian Water Catalogue

1st Draft proposal prepared by 3 expert groups:

- Energy management
- Ecology
- Other water management aspects

Experts from
- Ministries
- Regional governments
- Science

(public) Presentation → Commenting phase

Commenting phase → Discussion rounds with each stakeholder

Discussion rounds with each stakeholder → 2nd draft

2nd draft → (public) Presentation of 2nd draft

(public) Presentation of 2nd draft → Final discussion round for final agreement

Final discussion round for final agreement → Finalisation and publication

1.5 years

Source: Dr. Veronika Koller-Kreimel (BMLFUW)

Besides the Water Catalogue additional strategic planning approaches have been implemented in Austrian provinces

- **Initiated by**
  - Provincial governments (water management planning body)
  - Hydropower company
- **Two approaches applied**
  - Focus on rivers with high ecological value (limitation for use)
  - Designation of river stretches for (specific) hydropower use
- **Support appropriate site selection for new hydropower stations**
  - Taking into account all relevant public interests (i.e. also nature conversation and spatial planning)
  - Classification of river stretches according to suitability for hydropower use

Source: Dr. Veronika Koller-Kreimel (BMLFUW)

Strategic planning approaches for hydropower development in Austria - lessons learned so far

- Need for political commitment
- Definition of overall role of hydropower within future electricity mix (quantitative and qualitative)
- Early involvement of all relevant stakeholders (-„round tables“)
- Emphasize advantages for all parties and stakeholders
- Moderated process (mediator) and aligned communication activities
- Selection of parameter based on already available or easily collectable data
- Inclusion of “all” relevant interests (e.g. tourism, flood defense, recreation, social aspects, …)
- Applicability of criteria should be tested with real-live examples