E-CONTROL

WORKING FOR YOU – WHEREVER YOU NEED ENERGY.
The role of Hydropower in Austria

8th Energy Charta Task Force Meeting
Regional Energy Cooperation between Central and South Asian Countries
Dushanbe, Tajikistan
20 July 2012
Outline

- Portrait of E-Control Austria
- Hydropower in Austria: Significance and Potential
- Support Schemes for Hydropower in Austria
- Regional Flows and Cooperation
E-Control Austria Portrait

• The regulator has the job of strengthening competition in a liberalized energy market

• The regulator acts even-handedly in the interests of all market participants - regulators must be politically and financially independent

• This was the thinking behind the establishment of Energie-Control Austria in 2001

• On 3 March 2011, E-Control was transformed into a public authority
E-Control's Duties

• Setting the framework:
  – establishing market rules for competition
  – regulating network tariffs

• Exercising market oversight:
  – identifying and remedying competition violations
  – tracking and analyzing market development
E-Control International

E-Control is an active member of

GOAL
facilitating the creation of a single, competitive, efficient and sustainable internal market for gas and electricity in Europe

CEER
• Council of European Energy Regulators
• Voluntary, not-for-profit association of regulators

ACER
• Agency for the Cooperation of Energy Regulators
• ACER is operational in Slovenia since March 2011

ICER
• International Confederation of Energy Regulators
• Voluntary framework for cooperation between energy regulators from around the globe
E-Control and EU Twinning Projects

- Projects between EU MS and non-MS
- Aimed at institution building and knowledge transfer
- E-Control has carried out/is carrying out a project in Ukraine, Macedonia, Croatia and Georgia with the local regulatory authorities
Hydropower in Austria: Significance and Potential
Austria is a small landlocked country in Central Europe with a great hydropower potential
Austria Top in Power Generation from Renewables

Source: Eurostat 2012
Electricity Generation in Austria

- Hydropower: 58%
- Fossil Fuels: 39%
- Other Renewables: 3%

Source: E-Control, June 2012
Types of Hydropower

Installed Capacity 2010: 12 919 MW

- Run Of River: 67.1%
- Storage power stations: 32.9%

Source: E-Control, June 2012
Hydropower Construction in Austria

- **After 1945:** reconstruction period – major development of hydro power in Austria
- **60s and 70s:** peak of hydropower development
- **80s:** more sophisticated approval procedures
- **90s:** environment and ecological movement
- **End of 90s:** start of market liberalization
### Hydropower Potential in Austria (1)

<table>
<thead>
<tr>
<th>Potential Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Theoretical Potential</td>
<td>90000 GWh</td>
</tr>
<tr>
<td>Economic-Technical Potential</td>
<td>56100 GWh</td>
</tr>
<tr>
<td>Already Used Potential</td>
<td>- 38200 GWh</td>
</tr>
<tr>
<td>Remaining Economic-Technical Potential</td>
<td>17900 GWh</td>
</tr>
<tr>
<td>Water in Natural Parks and other Sensitive Areas</td>
<td>- 5100 GWh</td>
</tr>
<tr>
<td>Remaining Potential</td>
<td>12800 GWh</td>
</tr>
</tbody>
</table>

- **Around 70% of the total economic-technical potential is already developed**

- **Existing power plants are up to date, upgrading will only generate little amounts of additional production (1 400 GWh out of 17 900 GWh)**

- **The remaining potential will, thus, mostly be used by developing new sources (16 500 GWh out of 17 900 GWh)**
Hydropower Potential in Austria (2)

Source: Pöyry 2008
Expansion Potentials for Renewable Energies in Austria to 2020

Growth potential in TWh

| Source: Oesterreichs Energie, Kaltschmitt 2009 |

- **Hydro power**
  - 7 TWh = 40% of the extractable potential in the long run

- **Wind**
  - 4.3

- **Biomass**
  - 2.9

- **Photovoltaic**
  - 0.1

- **Geothermal**
  - 0.1
Support Schemes for Hydropower in Austria
Support Mechanism for Hydropower

- Austria has a support scheme for electricity generated from renewable energy sources including from hydropower.

- Austria’s Green Electricity Act aims to promote particularly those renewable technologies which have a prospect of becoming competitive on the market.

- The support scheme mainly consists of feed-in tariffs (= a tariff above market price paid out to producers of green electricity); additional investment grants (one time payments) can be obtained occasionally from regional governments (‘Laender’).

- Financial incentives are based on economic calculations taking various indicators into account, for example the amortization period of a plant.

- Support typically lasts for the whole amortization period (13-15 years in case of hydro power plants).
Motivation for Renewables Support

- Various national and EU targets:
  - Until 2015 (Austria):
    - 15% supported green electricity in Austria (Austrian Green Electricity Act)
  - From 2010 to 2020 (Austria):
    - + 1000MW (or ca. 4 TWh) hydropower
    - + 2000MW (or ca. 4TWh) wind power
    - + 200MW (ca. 1.3 TWh) biomass and biogas
    - + 1200MW (ca. 1TWh) photovoltaic
  - Until 2020 (EU):
    - 20% share of renewable energy until 2020 (total energy mix)
    - To contribute to and achieve this EU goal, Austria has to increase its renewables share from 25% to 34% (gross final energy consumption)
- Demand for green electricity by customers (household customers)
Eligibility and Financing

- Small hydropower producers (up to 2 MW) are eligible for receiving feed-in tariffs

- The feed-in tariff is paid out to green electricity producers by the Green Power Settlement Agency

- The Green Power Settlement Agency receives its funds from
  - sales of green electricity to suppliers/traders (all Austrian electricity suppliers/traders are obliged to buy a specified amount of supported green electricity from the Green Power Settlement Agency)
  - customers (metering points) paying a fixed charge (= green electricity fee, 11€ a year) and a support contribution (new law from July 2012, amount tbd) and other charges (e.g. passed on green power certificates) -> household customers pay around 45€ a year to uphold the system
Austrian Support-System

- Small hydropower Operators (up to 2 MW)
- Feed-in tariff
- Operators of other green power plants
- Green power settlement agent (OeMAG)
- Balance group
- System operators
- Green electricity fee per metering point
- Settlement price for aliquot small hydro power
- Settlement price for aliquot „other“ green electricity
- Passed-on billing price
- Limitation for energy intensive plants (0,5% NPV)
- Consumer
- Electricity traders
- Law amendment July 2009

Flow of „other“ green electricity
Flow of small hydro power el.
Cash flow
Cash flow consumer - electricity trader

Source: E-Control 2011
Development of Average Feed-In Tariffs

Feed-In Tariffs 2011 for new green power plants in Cent/kWh

* Biogas - raw material subsidy
2008: incl. 3.91 Cent/kWh
2009: incl. 3.00 Cent/kWh
2010: possible RMS not included

14,06 * Biogas
13,56 Biomass solid

7,76 Wind
5,14 Small Hydro

Electricity Market Price 2010

[22/03/2011 | Source: Energie-Control Austria, Öko-BGV, CeMAG]
Total support payments per technology 2003-2010

[Sources: E-Control Austria, OeMAG]
Regional Flows and Cooperation
Seasonal Pattern of Electricity Production
Consequences of Seasonal Production Differences

- Production is low in winter months and high in summer months due to the high share of hydropower in Austria.
- Austria exports most of its electricity in summer months and imports most electricity in winter months.
- Most exports go to Germany and Switzerland mainly to cover peak demand.
- Most imports come from Germany and the Czech Republic.
Physical Exchange of Electricity with Neighboring States in 20120 (TWh)

- Export out of A: 17.6 TWh
- Import into A: 19.9 TWh

Source: Oestereichs Energie, E-Control, 2010
Conclusion

• Hydropower plays a crucial role in Austria given that almost two thirds of Austria’s electricity is generated from hydro power

• Austria’s top position with respect to renewables in its energy mix largely stems from hydropower

• Through the renewables support scheme (and the forced sales of green electricity to every supplier/trader), electricity sold in Austria always contains a share of green electricity

• Cooperation with neighbors ensures that electricity flows to where it is needed most
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