



SHERPA – WORK SHOP SHP AT SCANDIC CROWN HOTEL IN GOTHENBURG, SWEDEN 17 SEPTEMBER 2008



The Swedish National Policy Forum on small Hydropower (SHP) took place on the 17:th of September 2008 in Gothenburg by Scandic Crown Hotel. The event was organised by the Swedish Renewable Association Energy Association (SERO – Sveriges Energiföreningars Riksorganisation) under Intelligent Energy for Europe program within the framework of the SHERPA project.

In total 60 persons attended the Forum. The statistics of the participants was as follows: Hydropower producers 36, Public institutions 6, SHP Consultants 5, Member of the Regional Authority 2, Member of the Swedish parliament 1, Environmental Associations 2 and others 8.

The participants were provided with the following documents:

- Layman's Guide in Swedish ESHA handbook on SHP in Swedish
- Public Image folders prepared for SHERPA
- SERO & ESHA information brochures
- SHERPA info brochure
- Report on Environmental integration prepared for SHERPA by APER

More information regarding the work shop can be found on: <http://www.sero-srf.se/>.



Programme

Moderator: Jan-Åke Jacobson, SERO.

Program

- 9:00-10:00 Registration and coffee
- 10:00-10:20 Introduction to SHERPA.
Christer Söderberg, President SERO.
- 10:20-10:40 Existing power generation, potentials and plans.
Tomas Söderlund och Annicka Wänn, SERO.
- 10:40-11:00 The Norwegian model for calculating potentials for SHP.
Torodd Jensen, Norges vassdrags- og energidirektorat.
- 11:00-11:20 Development of the power generation market.
Thomas Karlsson, VEGAB.
- 11:20-11:40 The licensing process, an obstacle for expansion?
Ragnhild Ahrel, SERO/SRF.
- 11:40-13:00 Lunch
- 13:00-13:20 The Water Framework Directive, the impact on hydropower
Anna Ek och Johan Kling, Vattenmyndigheten Västerhavet.
- 13:20-13:40 How the EU:s targets for Renewables will affect the hydropower?
Helena Olssén, Svensk Energi.
- 13:40-14:00 Aluminium construction of the waterway – Intake grid and ways of aluminium at Träbena kvarn
Lennart Wetterstad, Wetterstad Consulting AB. Nicklas Martinsson, SAPA.
- 14:00-14:30 Kaffe
- 14:30-15:00 The environmental issues of hydropower
Mathias Gustavsson, Svenska Naturskyddsföreningen.
- 15:00-15:20 The development of green certificates
Roger Östberg, Energimyndigheten.
- 15:20-15:40 Panel: What is needed for an increased electricity generation from SHP?
- 15:40-16:00 Questions and Summary



Presentations

Introduction to SHERPA

Christer Söderberg, President SERO.

The definition of Small-scale hydropower has had its ups and downs in the last 100 years. The definition of small-scale hydro power in Europe is not uniform, although the European Commission has defined a maximum of 10 MW and all investigations initiated by the Commission connect to this capacity. In Sweden, the limit is 1.5 MW, in Germany 5 MW and so on. In recent years, the EU has taken a firmer grip on the use of renewable energy. The reason for this is a reflection on the increasing environmental pressures from fossil energy, greenhouse effect, the oil era is approaching the end point and the Union's high dependence on fuel imports. In various stages, therefore, the EU launched investigations of the share of renewable energy should be increased, the White Paper, Green Paper, Directives 2001/77/EC on the promotion of renewable power generation and, most recently, energy and climate with goals for the year 2020.

The study SHERPA with nine participants from eight countries with the ESHA (European Small Hydropower Association) as the coordinator's goal is to give the European Commission, but also national politicians and policy makers, a picture of the status of small scale hydropower in the 27 member states, the conditions for licensing and operation, market, etc., in order to achieve the desired objectives. The study will also make proposals for action when deemed appropriate. The report of the investigation must be submitted to the European Commission by 31 October 2008.

Existing power generation, potentials and plans

Annicka Wänn: Master of Science with a focus on energy. One of the three project members from Sweden in SHERPA. Has worked on waste management in China and district heating for Vattenfall, Uppsala.

Tomas Söderlund: Master of Science. One of the three project members from Sweden in SHERPA. Has worked with energy issues for about 15 years. Of which, about six years with issues regarding the market and a further nine years of experience in working with energy issues.

The White Paper set a target for the small-scale hydropower calculated from 1997 to the EU-15 in 2010 will have a capacity of 14 000 MW, corresponding to an output of 55 000 GWh. We are approaching 2010 with brisk momentum and then it's interesting to see how the EU-15 is under the White Paper. Even with the new additions from the EU-12, we will find it difficult to achieve this goal. However, there's potential in the whole EU-27, both in renovation and the restart of old plants as well as in new construction.

There are two directives from the EU, which apparently is little in contrast to each other. The first is the Water Framework Directive, which has still not been implemented in Sweden and to protect the inner surface waters, transitional waters, and coastal waters in different ways. The second is 2001/77/EC working to promote electricity from renewable sources by simplifying the procedures for permit applications, and reduce administrative barriers to development. However, these Directive is seen as an opportunity for cooperation so that everyone can pull in the same direction.

However, these directives be seen as an opportunity for cooperation so that everyone can pull in the same direction in the sustainable environment and energy.



Sweden has good conditions for small-scale hydropower. A not inconsiderable part Sweden's electricity comes from small-scale hydropower. In addition, there is a potential for upgrading existing plants and for new SHPs.

Compared with our Nordic countries are we in the middle in terms of existing electricity generation and the potential for small-scale hydropower.

The statistics for the production of electricity from small hydro differ between the data based on electricity certification scheme and the statistics to Eurostat. It is because many owners of SHPs do not report to the SCB (Statistics Sweden), while the other hand, reporting to the system of electricity certificates to obtain compensation. In the case of potentials Norway have made a most interesting work to develop a more accurate potential for hydropower. The result shows far greater potential than previously thought. The corresponding work for Sweden would be desirable.

The work of SHERPA is not yet clear, but, for example, it is already clear that the industry would like to see clearer and more predictable rules to reduce the risks inherent in the project for small-scale hydropower.

SERO are now taking on new initiatives to find new solutions to the development of small hydropower. It includes, among other things, meetings with departments, political parties and authorities. In addition, they are meetings with the environmental movement to jointly find solutions for the small-scale hydropower.

The Norwegian model for calculating potentials for SHP

Torodd Jensen, the Norwegian Water Resources and energy directorate.

Responsible for resource section of the Energy and marketing of the Norwegian Water Resources and Energy Directorate, NVE. Our task is to be an advisor to Energy and be updated on resources, technology and cost for all renewable energy and new energy technologies. We have a role in NVE handling of concessions by the fact that we check all applications for concessions projects technical / economical to clarify the value of the society. This is used later as environmental counterpart to the project creates. We have activities related to the EU's Water Framework Directive and directive for renewable by the fact that we approve projects for guarantee for flows. We were heavily involved in talks with Sweden on a common green certificates and will be there again in the work resumed. We have a job with Life Cycle analysis and analysis of the affection of the climate for production.

The main focus should be directed against the results of our nationwide survey of SHP where we used GIS based tools to identify interest for the establishment of SHP. As background, we had an overview of all the developed power plant in Norway, and all plans for new power plants. In addition, we had things in hydrological data electronically and linked to the map. After many years of manual mapping resources and technical / financial control of applications for concession projects, we had good cost data for both small and large power stations. This was converted to electronic use, and we designed SHPs in the model with regard to hiring, movement and power plants with turbines, generators, etc. We also created a basis for calculating the infrastructure with regard to linking networks and way.

We spent about 2 years to research on bringing GIS to work because automation would be such that the marker was to go up a river, identify the case, calculate fields and amount of water, to identify with the size of the power plant is so that the dam estimate was calculated, pipelines were designed and the type chosen, about the length found, the power plant, located on variable sediment / rock with tripe (turbine / generator, etc.) assume head and water volume. Max design of oxygen was rated assume 2x average drainage in m³ / s. With all sizes



calculated / identify was that the whole quantify. All of this went automatically. Before the work could begin, however, we have to make river network that describes the rivers and this is a great job. After that the execution was carried out, we had to manually go in to adjust for hydropower development, and identified (not built) is greater hydropower projects than excluded SHPs in the same area.

In addition, we collect information about verde areas so that hydroelectric power in these areas were not included in the list of possible potential.

Development of the power generation market

Thomas Karlsson, VEGAB. Worked on a full-time in 30 years with small-scale hydropower. 10 years on ABVs technology office (current NCC), and then 20 years in our own company VEGAB. He has worked with hydrological investigations, licensing, environmental, production and energy, detailed studies of projects, taught at Chalmers University in technique for hydropower and so on. Gradually, a consultant scaled down as we bought our own power plants and I work now around 10-20% with consultancies and the rest in-house with our 7 power plants.

The Nordic electricity market has the last 10 years swung between extremes with regard to the supply and demand. Developments in Norway, Sweden, Finland and Denmark going in different directions. Is it possible to achieve a good balance? How does the Nordic the electricity market of connections with Germany, Holland, Poland, Russia and Estonia?

The licensing process, an obstacle for expansion?

Ragnhild Ahrel, SERO / SRF. Member of governing board of SRF 1995 - 2008, the first year as an alternate member and then ordinary member of the Board. Working as subcontractors to larger consulting firms, mainly with the Environmental Impact Assessment with all that implies in terms of consultation, defence, etc., but also with some other things such as inspections of dams. Sheep are currently the majority of the contracts by Walter Johansson, SWECO, the office in Falun. Participates at the court where EIA's are presented and defended.

When a project idea is issued it often raises many questions. This allows process of licensing to be lengthy and thus significantly more expensive than was calculated first in the planning.

The Water Framework Directive, the impact on hydropower

Anna Ek: Limnologist in the county authorities in West Götaland. Working primarily with Water Framework Directive both on water and on the county's the secretariat for preparations .

The Water Framework Directive was adopted in 2000 and a new water management has been built up in Sweden. Sweden is divided into five water districts, and a county administrative board in each district has been appointed to the water. In the fall of 2008 worked nationally to agree on the Guide to heavily modified water bodies and exemptions, and to agree programme for measure design. In December will water delegations to take a decision on the proposals for action and management plan in the spring of 2009 will be out for consultation. In December 2009, the delegations for water to take decisions on action plans and management. The interaction and dialogue with stakeholders affected by water management is central to water district work.

How the EU:s targets for Renewables will affect the hydropower?

Helena Olssén, Svensk Energi. Regionchef i Svensk Energi som är branschorganisation för elföretag i Sverige. Har läst Kemiteknik i Göteborg på Chalmers och kom till Svensk Energi 2002 via Elforsk som är elföretagens forskningsorgan.



EU targets for renewable energy is 20% in 2020 and today is the level around 8.5%. An overall increase of 11.5 percentage points, therefore is necessary. The breakdown of the objectives for national targets are based on two components: 1) a fixed part for all MS of 5.75%, and 2) an element based on GDP per capita modified in relation to the measures already carried out by the Member States which increased the percentage of renewable recent years. Sweden was hearing the case 49% renewable outgoing from 39.8% today, that is 9 percentage points. In order to achieve this objective, among other things, changes in existing processes, more efficient approval processes and a review of support schemes for renewable.

Aluminium construction of the waterway – Intake grid and ways of aluminium at Träbena kvarn

Lennart Wetterstad, Wetterstad Consulting AB, Åsarp.

Träbena kvarn, a mill site since 1560, was restarted after 40 years in the spring of 2008. Environmental judgement had been obtained under certain restrictions, such as the fish way and a maximum of 20 mm between the grid bars. The power plant is completely new except for the turbine which has been renovated. The material of the bars was elected extruded aluminium that provides better corrosion properties, low resistance of flow and good ability to clean. Even stop logs in three different lengths for different spill ways was elected in aluminium. They consist of a rectangular profile of a box as naturally filled with water and they do not float. This together with design of a hook for lifting gave a better manageability and less leakage than the stop logs of wood. A degree thesis 2007 at the University of Skovde on the Intake grides of aluminium for small-scale hydropower plants, has been the basis for development and economic calculations. Reference is also given to Aledals power station.

The environmental issues of hydropower

Mathias Gustavsson, Society for Nature Conservation.

The human impact on Earth is big and it is about far greater changes than 'just' climate change. Ecosystems are becoming more and more agitated by various sources of the surrounding world. It is therefore important to minimize the environmental impact from hydropower plants to relieve the ecosystem and prevent damage to the biological diversity. Impact on the environment from hydroelectric power is unique to each power plant and partly depends on the local ecosystem, plant construction and how the power plant and dam is exploited. In general, the hydroelectric power plant is an obstacle for different organisms and the regulation of water affects the ecosystems upstream and downstream. Presentation provides an introduction to environmental issues related to hydropower.

The development of green certificates

Roger Östberg, Energimyndigheten. Work as Programme / project manager at Swedish Energy Agency department for systems analysis. He belongs to the unit operational instruments dealing with electricity certificates and allowances. In the case of electricity certificates so Group responsible for information, supervision and administration of electricity certification scheme. He joined Energy sector in late 2002 and thus participated in the introduction of electricity certificates. As with previous work experience as a consultant for the hydropower industry, in most matters relating to electricity certificates and hydropower at Rogers desk. For the time being, Roger project manager for the change is happening around law of the green certificates.



How develops the support system with green certificates? The system for green certificates is a market-support system for the development of electricity generation from renewable energy sources and peat in Sweden. The goal is to increase electricity generation from such sources with 17 TWh from 2002 levels by the year 2016. The system will help Sweden to reach a more ecologically sustainable energy system. In order to streamline and further develop the system was introduced on 1 January 2007 a series of regulatory change that govern the system. Among other things, imposed limited allocation, which means that the new plant receives electricity certificates for 15 years and the majority of older plants receive electricity certificates until the end of 2012. The amendment was introduced among other things, to limit consumers' costs for older commercial self-installations. The talk will inter alia address hydropower conditions and opportunities in the electricity certification scheme today and in the long term.