

ENVIRONMENTAL ASSESSMENT GUIDELINES FOR HYDRO POWER



Applying to hydro power production complying with the eco-energy labelling terms and conditions.

1. Sequence and scheduling of procedures

Sequence

The sequence of events is as follows:

- Drafting of an inventory proposal.
- Proposal for approval by the Finnish Association for Nature Conservation.
- Implementation of audit.
- Results and action plan to the Finnish Association for Nature Conservation.

Schedule

Based on the auditing carried out, an action plan complying with the eco-energy labelling terms is thus prepared which is forwarded to the Finnish Association for Nature Conservation within one year of approval for the eco-energy label. Since, however, the field auditing has to take place at the appropriate seasons, auditing may overlap into the following year. This notwithstanding, a preliminary action plan can be drawn up on the basis of the auditing carried out and this should be forwarded to the Finnish Association for Nature Conservation within one year of approval for the eco-energy label.

When preparing the action plan, advantage can be taken of previous audits.

2. Auditing

Auditing comprises:

- **a report on the water court's material**, which includes a list of the existing water court's material applying to the hydro power plant(s) linked to the eco-energy label:
 - material connected with the hydro power plant's applications to the water court,
 - the obligatory monitoring reports required for the permit decision,
 - the commitment statisticsand
 - the permit terms and conditions.
 - **a report on other material**, which includes a list of the published literature, reports, studies and surveys applying to the environmental impact of the hydro power within the area of impact of the hydro power plant(s) linked to the eco-energy label.
 - **a description of the area of impact**
- and
- **an action plan.**

2.1 Description of area of impact

The audit proposal should include a field mapping plan together with a map.

Field mapping

The plan should include:

- Delineation of the impact area
- Defining of phenomena to be studied (e.g. flood fluctuations and changes in flow rate)
- The rationale used for defining the area of impact
- Existing reports used (e.g. references to literature)
- Person(s) carrying out audit.

Rationale used for the delineation on the inventory area

- the bases used for defining the area should be given in the audit plan accompanying the map/ maps.
- When defining the extent and content of the audit, the starting point can be e.g. some valuable species, the survival of which is favoured by the audit and subsequent procedures. The Finnish Association for Nature Conservation will review the criteria at the beginning of 2004. As the energy utility may still wish to continue its association with the eco-energy labelling scheme after the current eco-energy criteria have expired, the area defined now should make provision for future needs. This means that the audit as a whole may take place in several parts.

Auditing schedule

To ensure its success, the field audit should be carried out at appropriate times of year. For instance, many plant species are most easily identified while flowering, an otter's footprints show up best in the snow, and the dipper nests in spring.

Maps

The entire area of impact (Map 1)

A map showing the entire area of impact of the power plant(s), i.e. the water course which will be affected by regulation or some other consequence of hydro power production, and the area below the dam insofar as this is affected by such production. Even if the water course is altered for other reasons (e.g. flood control), the whole area should be indicated if this is of benefit to hydro power production. The map may be approximate, the main point being that the entire area of impact should be clearly visible. This must be indicated on the map, even if the eco-energy label is being applied for in conjunction with a single power plant's production on a river occupied by several active plants. The map should be of A2 size. The power plant's location should be marked on the map.

Defining of the inventory area (Map 2)

A map on which the limits of the proposed area(s) are marked in their entirety. Maximum map size A2. The audit area and the location of map 2 on map 1 should be apparent from the maps.

Other maps

If necessary, more detailed maps should be included. In particular, if the mapped area extends over a large surface area (e.g. a river system with several channels and their banks), or areas from several channels are being audited, so that map 2 is drawn to a large scale, it may be expedient to include more detailed maps for showing the extent of the area with sufficient accuracy.

2.2 Action programme

Based on the results of the inventory, a proposal is prepared for reducing the impact. This proposal should include:

- Prioritisation of adverse effects.
- Measures and a schedule for their implementation.
- A plan for an additional inventory, which can presented if this is called for.

Background support is available from the Finnish Association for Nature Conservation while an inventory is in progress

APPENDIX

What should be assessed

Extent of the inventory area

Prioritising the effects of the hydro power is a difficult undertaking. Assessments may also depend on the auditor's special expertise.

Some auditors will consider the most serious effects to be on fish stocks. Others will feel the loss of wetlands or the impact on seasonally flooded meadows to be a major change affecting more than just the fish.

Further, the availability of property on a shore or river bank may go up or down as a consequence of regulation. However, the kind of auditing referred to here applies only to ecosystem impact.

When defining the audit area, discussions should be held with e.g. the regional environment centre, the TE centre (regional employment and economic development centres in Finland) and other ecological experts in the area.

If the area of impact of the hydro power plant(s) is extremely broad and cannot be audited in its entirety, the area(s) to be audited should be those **areas or phenomena** (biotopes, species, form of channel) **on which the hydro power has had the greatest impact.**

The bases of the prioritisation should be given. If, for example, only the morphometric changes (i.e. those affecting the physical form) of the channels and basins are chosen for auditing, and not e.g. changes in the extent and density of occurrence of wetlands and typical biotopes, this means in practice that morphometric changes are assessed as having a greater impact on the ecosystems of the area of impact than changes occurring in the wetlands and biotopes.

The reasons on which the defining of the area is based for auditing purposes must be based on information about the state of the environment (ecology) in the area of impact prior to the construction of the hydro power plant/ commencement of regulation, and on the provisional information and existing reports on the ecological state at the present time.

When preparing an auditing plan, the state of the modified ecosystem following the construction of the hydro power plant must also be taken into account. This could include e.g. new species or new biotopes appearing in the area, or an improvement in the status of endangered populations occurring previously in the area.

The state of the auditing area before the construction of a power plant/ regulation must be determined and the present state documented such that the change can be reliably assessed. Often the reason for the change is something other than hydro power production.

An effort should also be made to take the contribution of other factors towards the change into account, as well as the combined impact.

The regional environment centres and Finland's Environment Agency will be carrying out surveys of biotopes and colonies of species compliant with the Nature Conservation Act over the next few years. To avoid unnecessary overlapping, enquiries should be made about the scheduling of, and plans for, these when the area of impact is being defined.

Auditing associated with eco-energy labelling can be planned so that it supplements the mapping carried out by the authorities. Cooperation should be initiated by contacting the nature conservation unit of the regional environment centre.

Examples of auditing targets - a check list

Wetlands/floodplains and seasonally flooded areas

- Types, division into endangered and not endangered entities.
- Total area with main types.
- Regional coverage.

Dominant biotopes

Division of list:

- not endangered
- endangered
- biotopes referred to in the Nature Conservation Act
- key biotopes referred to in the Forest Act
- other valuable habitats
- biotopes to be protected in the channel which are referred to in the Water Act.

Flora

- General description.
- Occurrence of endangered species (one or more):
 - species,
 - colonies,
 - description of habitat and of the factors threatening it.
- Changes in the occurrences of common species as a consequence of hydro power production.

Fauna

- General description.
- Occurrence of endangered species (one or more):
 - species,
 - colonies,
 - description of habitat and of the factors threatening it.
- Changes in the occurrences of common species as a consequence of hydro power production.
- Impact of regulation and the dam on the fishery and on the reproduction and living conditions of commercial fish species:
 - changes in fishing and catches
 - changes in the population
 - changes in the spawning and nursery areas
 - changes in the feeding areas
 - other changes in living conditions.

Geomorphology of the reservoir or channel

- Physical form of the littoral zone:
 - erosion and deposition areas caused by hydro power production
 - shallowing/ deepening
 - narrowing/broadening of zone and
 - effect on vegetation.
- Form of channel or basin and bottom material.
- Flow conditions:
 - increase/ decrease in flow rate
 - periodical drying up
 - timing of floods
 - timing and length of high-/ low-flow seasons
 - impact on biota.

Contact details:

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