

The email survey was intended to assess the extent to which current regulation impacts the development of very small scale hydropower in the UK, and to obtain views on whether and how a system of registration of schemes could operate. The survey covered the 65 independent members of the Micro Hydro Association who install or supply products and services. There were 24 returns (37%) including most of the principal installers/suppliers of micro hydro in the UK. See "[mha resource survey 2012 detailed responses.pdf](#)".

VIEWS ON CURRENT REGULATION IMPACTS AND REGISTRATION APPROACH

24 of 24 agreed with the registration approach; some comments from across the UK:

"Regulation of both Environment Agency and planning are becoming increasingly onerous with enormous duplication of facts."

"Future opportunity for developing micro hydro schemes is greatly threatened . . . leaving a wealth of viable water energy resource unexploited."

"I'm trying to do the applications for our own 6kw scheme and found the hurdles ridiculous."

"could install lots more, maybe 15 in a year but for our bottleneck of gaining consents and grid connections . . . I am staying generally staying clear of sub 15kW stuff unless it is a particularly simple scheme to consent and install. We are now 14 months on a planning application of a scheme that will take just 5 weeks to install."

"far too many good small sites [are] being passed over due to the existing administrative burden and uncertainties that exist."

". . .but perhaps as the EA and planning depts get more familiar with these types of schemes then they will recognise the very low impact and assess them appropriately and proportionally. However if the regulatory requirements for installing a system that uses 4l/s and produces a few hundred Watts stays the same then I can't ever see this being a viable business."

". . . I see [SEPA's] as being a good model for a safe registration regime with scheme[s] meeting the guidance able to be simply registered and those not meeting it requiring a more involved process (license) and more evidence regarding potential impacts."

VIEWS ON REGISTRATION CRITERIA

Design criteria

Those responding were broadly in agreement with the suggested design criteria, and that a combination of them should be used to define "small-scale/low impact".

Factors that were suggested as needing to be taken into account included gradient (e.g. 1:20), capacity or rate of energy generation, flow, catchment area (e.g. $\leq 10\text{km}^2$), proportion of water abstracted, hands-off flow, and potential to harm a habitat, length of reach particularly for low head high flow schemes. Most thought that head should not be used as a sole criterion.

Ecology criteria: All responders except one thought impact on ecology should be kept to minimum.

Water availability in depleted reach: responders were fairly well agreed that *maximum abstraction* should be $\leq 1.5 \times Q_{\text{mean}}$ at abstraction point; one responder pointed out that a max abstraction limit conflicted with achieving a high load factor. *Hands-off flow:* there was predominant agreement to Q_{95} just downstream of abstraction point, with Q_{90} in rivers with migratory fish or very small schemes where there was a risk of rivers drying out. Other factors thought to affect ecology included gradient (generally less affected on a steep rather than on a shallow gradient). One respondent pointed out

that most sub-10kW high-head schemes will have rapidly increasing catchment area along the depleted reach, and a significant start-up flow allowance above the HOF. Another said that good hydrology data is required to allow $1.5 \times Q_{30}$ to reassure the regulator, and suggested there could be bandings depending on the quality of hydrology data available.

Protected flora/fauna: Most responders were concerned about fish protection. One thought that denil, chevron etc fish passes should be standardised; another suggested that all new or refurbished hydro should be required to introduce or improve fish passage. As far as potential impact on protected flora/fauna upstream and downstream was concerned, there was some agreement that this should be judged by qualified walkover survey, with some suggesting that landowners could provide this information and that if there was a risk of European protected species being present then, and only then, should an ecologist be engaged.

CONCLUSIONS

All responders endorse a registration approach for very small scale hydro schemes but no single view on which criteria should be used emerged. In order to make registration of micro hydro schemes acceptable, many agencies will need to be satisfied that the design and ecological criteria applied will achieve the aims of the present regulation. Scheme developers will therefore need to demonstrate in their submission for registration and scheme design documents that they will provide appropriate ecological protection and will conform to construction guidelines, electrical regulations, and riparian rights. (Ofgem also require registration through the ROOFIT process to gain eligibility for the Feed-in Tariff).

Based on consideration of the survey responses, present regulatory requirements used to permit hydropower, and knowledge of schemes which have been permitted to date, I am proposing a set of simplified principles and specific criteria in the [APPENDIX](#) (this could be designed as a checklist) which could be used for registration of micro hydro schemes. An applicant for registration of a scheme would need to confirm that the complete set of registration criteria will be met and support this with a design statement. Where any of the criteria could not be met, an applicant would be expected to provide additional evidence to satisfy the competent authority that registration was still an appropriate route rather than reverting to the usual permitting process for hydro scheme developments.

The most appropriate location for the register of schemes could be either the planning authority or the environment agency responsible for the area predominantly covered by the scheme (though this could on occasion straddle more than one authority /agency). The registration document and design statement should be available to all authorities.

APPENDIX – DRAFT PRINCIPLES AND CRITERIA FOR REGISTRATION

The proposed criteria for micro hydro schemes following this page are designed to meet the *principles below* (which apply to all hydro schemes) by taking the actions noted in bullet points.

A hydro scheme should not:

risk significant damage to or reduction in the fish population in the whole river basin

- screen the entry of water at the abstraction point and screen outflow to avoid access to turbine
- limit disturbance of water and bed of watercourse at outflow
- ensure a hands-off flow (where water available) which will provide sufficient river bed coverage and flow so as to sustain any important habitat or food resource
- where there is significant use by fish of any affected reach of water (as judged by qualified walk-over survey and where appropriate electro-fishing): if there will be any weir construction or renovation exceeding natural obstacles, provide suitable alternative fish passage up and down the watercourse and protect fish spawning habitat (e.g. weirpools) against adverse changes in flows

reduce availability of water habitat for fish or other protected species in a river basin

- ensure a hands-off flow (where water available) to provide sufficient river bed coverage and flow to sustain any important habitat or food resource
- control changes in sedimentation resulting from any construction or renovation of a weir

increase risk of flood damage from a watercourse

- demonstrate that the net effect of raising the level of the watercourse or impoundment, and of diverting water from existing flows, does not significantly increase the potential risk of flooding surrounding land or property or reduces the risk

impact other (prior) water uses adversely or should compensate those affected

- contact all other affected users (e.g. livestock farmers, fish farms, canoe clubs, water companies) and agree any mitigation measures needed to allow continued use or agree compensation

damage land habitat of protected species

- in areas known or likely to provide critical support to protected species, conduct qualified ecological walk-over surveys to determine population and to confirm no significant impact from building or operating the hydro scheme – design mitigation measures if necessary
- avoid identified breeding or dwelling sites when building access tracks, foundations, laying pipes, etc.

create unacceptable noise in a populated or frequented area

- fit turbine houses with sound insulation if located in such an area

create unsightly structures in urban areas or places of natural beauty

- build small turbine houses using appropriate materials

create electrical risks

- notify/obtain connection offer from DNC via the appropriate procedure
- meet current electrical installation standards

REGISTRATION CRITERIA FOR MICRO HYDRO SCHEMES

The applicant will be required to confirm the following:

Design

- 1 **the design flow/capacity (DNC)** relationship falls within the following bounds.:
 - any scheme where design flow $\leq Q_{70}$ and DNC $< 100\text{kW}$
 - schemes where design flow $> Q_{70}$ and $\leq Q_{\text{mean}} \times 1.5$ ($\approx Q_{20}$), capacity (DNC) $< 50\text{kW}$, and residual flow immediately below the abstraction point always exceeds Q_{95} (when available) or Q_{90} where fish are present (see 6 below)
- 2 **design flow** $\leq Q_{\text{mean}} \times 1.5$, and **residual flow** immediately below the abstraction point always exceeds Q_{95} (when available) or Q_{90} where fish are present (see 6 below)
- 3 **depleted reach**
 - either* there is a $> 1:20$, gradient measured along the reach
 - or* the habitat in a shallower reach is of no ecological significance in the context of the river basin (see 6 below)
 - or* there is no depleted reach (as in an on-weir scheme)
- 4 **the height of the intake structure** is lower than the highest natural obstacles (to fish) in the depleted reach where fish are present (see 6 below) and does not create an additional flood risk upstream
- 5 **the catchment** of the watercourse above the intake is $< 10\text{km}^2$ for a design flow of $Q_{\text{mean}} \times 1.5$; value could be adjusted for design flow $< Q_{\text{mean}} \times 1.5$ or flow split schemes –
 - i.e. catchment $< 10 \times (Q_{\text{mean}} \times 1.5) / Q_{\text{design}}$

Ecology

- 6 a qualified walkover survey has confirmed that:
 - either* there are no protected fish or other species in or using the affected reach (where there is one),
 - or* the population that could potentially be affected is insignificant in relation to the remaining population in the same river basin
 - and* the design will ensure that any protected species on land will suffer no significant impact from building or operating the hydro scheme and that identified breeding or dwelling sites will be avoided when building access tracks, foundations, laying pipes, etc.

Other

- 7 no heritage or otherwise controlled areas are affected or relevant consents are being obtained
- 8 all neighbouring property owners are notified and confirmed not opposed to scheme
- 9 whole scheme lies on own land or agreement is being reached with affected parties
- 10 penstock (if any) is to be buried where feasible and otherwise secured safely
- 11 turbine house footprint will be $< 16\text{m}^2$ and sound insulated if within earshot of habitation or frequented nature location
- 12 where the scheme is to be grid connected, the DNO is being notified via the standard procedure
- 13 electrical regulations are being followed