

Josie Beruldsen

From: Bryan Leyland [mailto:bryanleyland@mac.com]
Sent: Tuesday, 7 July 2009 4:40 p.m.
To: Josie Beruldsen
Subject: National policy statement on renewable electricity generation

Note: I use a voice recognition system. It is not perfect and neither is my editing. Therefore you may see some strange words that sound roughly like what I really said and some short words that I did not say.

Dear Josie,

If I remember correctly, I was asked to comment on aspects of the national policy statement. In particular, the definition of "small hydro".

A definition of "less than a one, or five, or 10 MW is not very satisfactory. The problem is that the impact depends on the flow rather than the output itself.

To give an example, the Onekaka small hydro scheme in Golden Bay at an output of 1 MW. The head is 200 m and the flow is 0.6 m³/s. the scheme consists of a small dam in a remote valley, a buried 1400 meter penstock and a small powerhouse. Its major environmental impact is that it reduces the flow over about 1400 m in a steep valley with many waterfalls. If the head was only 50 m, the flow would be four times as high and everything would be physically larger and would probably have a greater environmental impact.

I have given the definition some thought and it seems to me that something along the lines of "a micro hydro scheme is defined as a scheme with a flow of less than 100 l/s or an output of less than 50 kW. If the maximum diverted flow is less than 30% of the flow available 50% of the time, then the only requirement is that the output be less than 50 kW." (This allows for higher flows if it does not divert too much water.)

And then: "a mini hydro scheme is one where the flow is less than 1000 l/s or the output is less than 500 kW. If the maximum diverted flow is less than 30% of the flow available 50% of the time, then the only requirement is that the output be less than 500 kW.

"A small hydro scheme is one where the flow is less than five m³/s or the output is less than 10 MW. If the maximum diverted flow is less than 30% of the flow available 50% of the time, then the only requirement is that the output be less than 10 MW."

With definitions like that in place, the environmental requirements and procedures can then be set out.

the most important requirement -- and the most expensive from the owner's point of view -- is how much flow is left in the river.

If there are waterfalls exceeding say, 1-2 m in height, between the dam and where the powerhouse discharges back into the river, then I would recommend that the flow released at the intake weir should be sufficient to achieve a minimum flow of 30% of the flow available 90% of the time at the power station outlet. (roughly, 30% of the "normal" low flow) The intent of this is to take

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advantage of the tributary flows that may be available to boost the flow downstream of the waterfalls. If the stream is one that is used by migrating fish, then adequate provision must be made for the fish to pass up and down the stream. I use the word "adequate provision" because it varies according to the type of fish. For elvers for instance all they need is a trickle of water through a pipe with with what is, in effect, a bottlebrush inside it. For others, it may just be a cascade of pools with sufficient flow to enable migration.

and other significant point is that, in the case of our river, the biodiversity is determined more by floods than by low flows. Every time we get a flood there is a major change but nature recovers quite rapidly -- as it has done for millions of years.

For a micro-hydro plant, I find it difficult to see why there should be any other environmental restrictions. The civil works and everything else is likely to be minimal because that is all that can be afforded.

The same residual flow requirements could apply to the larger schemes but may need additional caveats.

For the point of view of getting regulatory and environmental clearance, the major hurdles are getting water rights and approval for construction.

In our case, simply getting our water right extended for 35 years after the original 10 years had expired cost of something like \$100,000. Getting the compliance conditions changed so that we can demonstrate compliance in a way that is practical and doesn't carry excessive cost and complication, has cost us something like \$20,000 and is not yet ended. The problems are entirely bureaucratic. Nothing that we want to change has any effect on the environment.

Unless that sort of problem can be avoided, there is little chance that there will be much development in the micro, mini and small hydro field.

For micro-hydro, I would suggest that all that is needed is that the appropriate local authority the consultant. If the whole of the scheme is under single ownership -- or under the ownership of several owners who have all agreed in writing to the construction of the scheme, then the local authority should either have to produce credible arguments against the scheme or approve it. No consultation with people other than those directly affected should be required.

For mini hydro, the applicant should have to produce drawings giving the overall concept of the scheme and details of the intake and any areas where earthmoving activities may cause slips and the like. The developer should also produce hydrological data justifying the take and demonstrating that will leave adequate water in the stream. Consultation can be a bit wider and could include people for say 5 km downstream who might be affected.

For small hydro, the requirements would be basically the same but would extend to more detail.

For micro and mini hydro at least, I would add an option -- or a requirement -- that the first stage in any consultation is with the proposers and the potential objectors sitting round a table with a neutral chairman -- if such a person can be found! If they come to an agreement, then that is the end of the matter.

All this probably requires major changes to the RMA so it may be difficult to achieve. Also, why restrict these procedures to renewable energy? As I mentioned in my submission, I do not see why renewable energy should have special privileges compared to other forms of energy and other activities that may be perceived as being ultimately in the "public good".

I'm afraid this might be a bit of a ramble -- as is famously said "if I had had more time, it would

have been shorter".

Please let me know if I can help in any other way.

PLEASE NOTE:

My bleyland@woosh.co.nz email account will be shut down shortly. Please replace it with bryanleyland@mac.com

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