

# Reprint Island Tides

Visit [www.islandtides.com](http://www.islandtides.com) to read the current edition and more find more interesting articles on other BC, national & international topics in our extensive archive of newspapers and articles.

Reprint from Volume 21 Number 1

January 15, 2009

Run of River Power—No Quick Fix ~ Patrick Brown

## Bute Inlet power project will have cumulative environmental impacts

A multi-site, 'run-of-river' power, super-project has been proposed by Plutonic Power Ltd for creeks and rivers emptying into the upper Bute Inlet. The scale of transmission lines necessary to this proposal illustrates the problem of economies of scale and environmental effects in massive run-of-river power development.

The Plutonic project's 17 powerhouses would connect through 230kms of power transmission lines to a 200 kilometre high-voltage transmission line connecting to BC Hydro at Elk Falls, north of Campbell River on Vancouver Island. The project would have a maximum power potential of 900 megawatts (MW). The expected annual production would be 3,000 gigawatt-hours of electricity. (a gigawatt hour is one million of those kilowatt hours that you see on your electricity bill.)

### Transmission

**Requirement Impacts**  
The cost of transmission lines to aggregate and connect multiple power sources to the BC Hydro grid dictates that generation sites be located as close as possible to each other, resulting in a density which causes cumulative impacts on both the immediate generation areas and on considerable areas of adjacent land.

### Dams Versus Run-of-River

Spread over a large area, the Bute Inlet super-project proposal would have significant environmental impact in a little-known part of BC's central coast.

In terms of capacity, it could be compared with the long-discussed Site-C proposal on the Peace River, similarly rated at

900 megawatts but which has a potential annual production of 50% more electricity, 4,500 gigawatt hours (GWh).

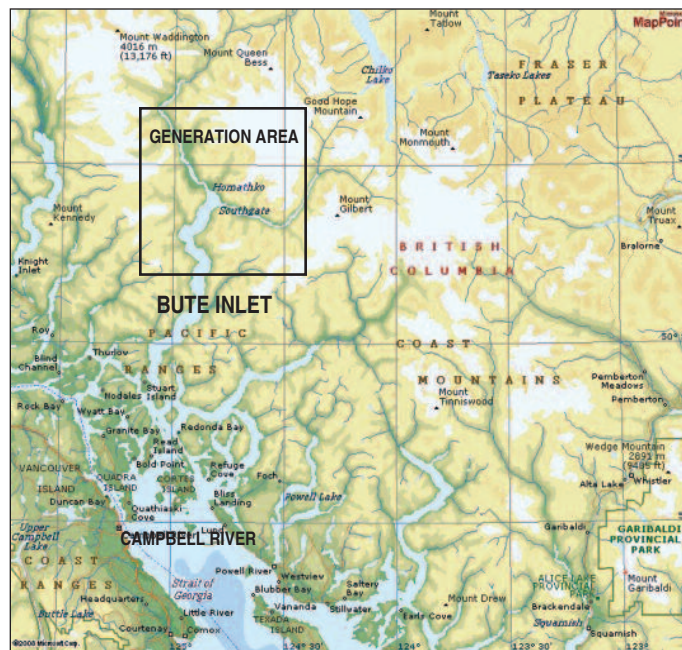
Site-C involves an earthfill dam and reservoir, affecting a much smaller area. The Site-C scheme also benefits from limited seasonal variation in stream flow, controlled by the upstream WAC Bennett and Peace Canyon dams.

### Power In/Power Out—Deficit Or Not?

For some time now, BC's Ministry of Energy and the government-owned BC Hydro has insisted that BC is a 'net importer' of power. Data on this is difficult to analyse because BC Hydro is also a major power trader, exporting to the US.

Much of this imported power comes from Alberta, where it may be generated by 'dirty' coal-fired plants. Since these plants run most efficiently at a constant high level, they generate surplus power at off-peak periods. BC, having a number of large

hydro-electric dams, is in a position to purchase off-peak power cheaply from Alberta, and substitute it for power from the dams—where flow, and therefore power production, can easily be cut-back in the off-peak. The power from the dams can thus be saved and sold at higher prices to US markets, particularly California, where air-conditioning loads peak in the daytime, particularly in summer.



© Island Tides Publishing Ltd. This article may be reproduced with this attribution, in its entirety, with notification to Island Tides Publishing Ltd.

This article was published (January 15, 2009) in 'Island Tides'. 'Island Tides' is an independent, regional newspaper distributing 17,500 print copies throughout the Gulf Islands and the Canadian Strait of Georgia from Victoria to Campbell River to Howe Sound.

Island Tides, Box 55, Pender Island, BC, Canada.  
Email: [islandtides@islandtides.com](mailto:islandtides@islandtides.com).

Phone: 250-629-3660. Fax: 250-629-3838.  
Website: <http://www.islandtides.com>

## Power Transmission & Green Power Projects

All this trading activity makes it difficult to determine what BC's power 'deficit' may actually be. The growth of BC's power consumption annually is also difficult to estimate, particularly as it is currently affected by economic changes.

### BC 'Green' Power

The provincial government has set as policy the requirement that additional power generation be 'green'—that is, produced from renewable resources with minimal environmental impact. In fact, a requirement that new installations produce no greenhouse gases has resulted in an effective moratorium on coal-fired generation in the province.

### Independent Power Producers

The government has set as policy that new generation facilities be built, not by BC Hydro, but by private sector Independent Power Producers (IPPs).

Responding to these policy directions and future needs, BC Hydro has called for tenders from IPPs for 'green' generation facilities. The 2006 tender call sought proposals to yield a total of 5,000 GWh per year.

In response, a large number of IPPs proposed projects using 'run-of-river' waterpower, small dams (some existing), wind power, and biomass combustion (some with coal). As a result, BC Hydro has indicated its willingness to negotiate Electricity Purchase Agreements for some 39 projects, totaling 7,351 GWh/yr. Not all these projects are, however, expected to be built.

### Run Of River Projects

22 of these projects are for 'run-of-river' power generation under 10MW each, scattered all over BC. Nine projects are for larger 'run-of-river' installations, including some proposing (or utilizing existing) small dams.

While every 'run-of-river' project involves a small dam, or weir, to divert flowing water into a penstock leading to a water-powered generator, 'run-of-river' dams are generally defined as having a reservoir capacity of less than 48 hours' waterflow.

### Plutonic Power on Toba Inlet

The largest proposal bid into the 2006 tender call and accepted by BC Hydro is Plutonic Power's \$660 million East Toba/Montrose project, at 196 MW and 702 GWh/yr. This project generates electricity from two substantial creeks flowing into Toba Inlet, the next inlet to the south of Bute Inlet. The two generating plants will feed a common 148km power transmission line to a BC Hydro substation at Saltery Bay on Jervis Inlet.

While exact details of the 35-year contract with BC Hydro have not been revealed, the negotiated price for power is apparently between 7.137¢ and 8.423¢ per kWh, yielding annual revenue to Plutonic of about \$65 million. This figure was confirmed by Plutonic spokesperson Elisha Moreno, Plutonic's Director of Communications (who previously worked for BC Hydro). It is noteworthy that the current retail price for power delivered by BC Hydro is from 5.98¢ to 7.21¢ per kWh.

The East Toba/Montrose proposal illustrates one of the major factors affecting the cost and environmental impact of 'green' power generation projects. While both wind and run-of-river projects themselves have relatively small geographic footprints, they are frequently in remote locations, requiring long and expensive transmission lines to connect to the BC Hydro grid. Without these connections, of course, they cannot sell power to BC Hydro or export it.

Individual small projects can thus only be economical if they are close to existing BC Hydro facilities. Thus of the thousands of potential sites in BC, only a few can be developed for transmission to the grid. Plutonic's East Toba/Montrose project met this challenge by developing two substantial creeks close to each other.

Plutonic is also doing preliminary work on a separate proposal for three further sites, totaling 130MW, in the same area and which may use the same power transmission connection.

### Back To The Bute Inlet Proposal

Plutonic's Bute Inlet proposal includes some 17 stream diversions on creeks leading to the Homathko, Southgate, and Orford Rivers which feed Bute Inlet, one of the larger fjords on the central coast of BC. The company has applied for 16 water licenses (Land Tenure Applications), a number of worksite leases, and 231 kilometres of powerline easements, connecting the powerhouses to a substation on Bute Inlet. The powerlines run up each of the three river valleys to the powerhouse sites, and also about halfway along the shore of Bute Inlet. A further powerline route runs over the mountains to connect to the Toba Inlet sites. The land applications for the powerhouses, installations, roads, and powerlines total 24,188 hectares.

The proposal also includes a 200km high tension transmission line from the head of Bute Inlet to Elk Falls on Vancouver Island. Its route runs along the shore of Loughborough Inlet (the next inlet to the north of Bute Inlet), crosses West Thurlow Island, and then a massive span across Johnstone Strait to Vancouver Island. The land applications for the transmission line right-of-way total 19,212 hectares.

In total, Plutonic's proposal would require grants of some 450 square kilometres of Crown land and water. It would include approximately 430 kilometres of transmission lines, 314 kilometres of roads, and 142 bridges.

### Financing Super-Projects

The entire scheme is currently estimated to cost about \$4 billion, making it the largest single private sector investment in hydroelectric generation in Canada. Annual revenues, assuming a 35-year contract with similar pricing to the East Toba/Montrose project, could be \$250 million per year.

Plutonic has a financing agreement ('partnership') in place with the large US finance firm, GE Energy Financial Services.

---

© Island Tides Publishing Ltd. This article may be reproduced with this attribution, in its entirety, with notification to Island Tides Publishing Ltd.

This article was published (January 15, 2009) in 'Island Tides'. 'Island Tides' is an independent, regional newspaper distributing 17,500 print copies throughout the Gulf Islands and the Canadian Strait of Georgia from Victoria to Campbell River to Howe Sound.

Island Tides, Box 55, Pender Island, BC, Canada.  
Email: islandtides@islandtides.com.

Phone: 250-629-3660. Fax: 250-629-3838.  
Website: <http://www.islandtides.com>

There seems little doubt that this combination would have the financial capacity to carry out the project.

GE Energy would invest \$650 million for a 60% (controlling) interest in the Bute Inlet project, and would also have the right to arrange debt financing for the project. The US government has recently agreed to insure as much as \$139 billion of GE Capital's anticipated borrowings. Currently, GE Capital's debt is estimated at \$548 billion.

### Site-C

The Peace River is already a major producer of hydroelectric power, with the WAC Bennett and Peace Canyon dams rated at 2730MW and 694MW respectively. A proposed dam at Site-C, seven kilometers southwest of Fort St John, would take advantage of controlled waterflow from these two dams upstream to produce 4,500GWh annually from a 900MW generating plant.

An 1,100 metre earth-fill dam would back up a reservoir 83km long, on average two to three times the present width of the river and flooding some 5,340 hectares. The dam and power generating facilities would cover another 1,000 hectares, and a 90km high tension transmission line to connect to the BC Hydro grid at the Peace Canyon dam would need an estimated further 2,000 hectares (some of which could continue to be farmed). This adds up to a total geographical footprint of 8,340 hectares, or about 83 square kilometres.

The current cost estimate for the Site-C proposal is between \$5 and \$6.6 billion. It would probably be publicly financed. The cost of power from Site-C has been estimated at 5.1¢/kWh, but the factors considered in this estimate are not clear.

### Comparing Environmental Impact

In the Peace River Valley, much has been made of the impact of another reservoir on the river, with the prime argument being against further loss of the rural land base to provide power for city customers a long way away.

The Plutonic Bute Inlet proposal provides an opportunity to compare the environmental impact of Site-C with the concentrated and cumulative impact of a aggregated number of run-of-river generation projects within a limited area of BC's coast.

It is clear from the extent of the power collection system (not to mention the 200km high tension transmission powerline) that the environmental impact of the run-of-river project extends far beyond the river valleys through which the proponent has requested rights of way; far greater than the 450 square kilometres of Crown land sought by Plutonic.

Along the shores of Bute and Loughborough Inlet, power lines and their rights of way would scar the landscape. Not

that all of the Bute Inlet area is pristine. There have been logging shows 'up the Bute' for at least seventy years—railways, skylines, steam donkeys, and hand-logging straight down to the saltchuck.

The feeder valleys are steep-sided, much of the timber is of low quality, and scree and slides make travel and road-building difficult. It is the narrow valley-bottoms of many of these valleys that Plutonics' power lines and access roads would fill and disturb massively. In fact, the scale of this project will change the ecosystem of a very large area of coastal forest, mountain, and valley.

It is reported that some 23 varieties of fish (including all five major varieties of salmon) are found in these rivers and streams; salmon, in particular, are a major source of nutrients for both animals and plants. The network of transmission lines and roads will fragment whatever wilderness is left.

### The OPA study

Plutonic officials refer often to an Ontario Power Authority study that scored run-of-river generation more favourably than virtually any other power source in terms of environmental impact. However, that study, mainly designed to compare various combustion strategies for fossil-fueled generation against nuclear power, excluded: 'site specific' factors, cumulative impacts, factors that applied to only one class of power generation, and the impact of transmission lines.

### New Study Needed

Environmental concerns may be the reason for the mid-December government announcement that industry regulator, BC Utilities Commission (BCUC), will conduct a study of 30-year power transmission needs for the province, starting this March.

David Emerson, CEO of the BC Transmission Corporation (BCTC) said that BCTC would use the results of the study to ensure that 'public infrastructure is in place on time to support clean energy.'

### 'Footprints'

The arguments so far about 'green' power generation have mainly been about public power versus private power, and the distribution of financial risk. But at least equally important is comparison of the environmental footprint of large 'legacy' hydroelectric power development and multiple 'run-of-river' generation projects.

For both the Bute Inlet proposal and Site-C, the footprint is much larger than the immediate sites, including not only the surrounding area, but also downstream effects, fish and wildlife migration, greenhouse gas emissions, visibility, sustainability and mitigation of the total ecosystem, and the foreclosure of other land uses. ✍

---

© Island Tides Publishing Ltd. This article may be reproduced with this attribution, in its entirety, with notification to Island Tides Publishing Ltd.

This article was published (January 15, 2009) in 'Island Tides'. 'Island Tides' is an independent, regional newspaper distributing 17,500 print copies throughout the Gulf Islands and the Canadian Strait of Georgia from Victoria to Campbell River to Howe Sound.

Island Tides, Box 55, Pender Island, BC, Canada. Phone: 250-629-3660. Fax: 250-629-3838.  
Email: islandtides@islandtides.com. Website: <http://www.islandtides.com>

---