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# Run-of-river Energy

*November 22, 2007*

## *What Runs but Never Gets Tired?*

**Governments support demand for renewable energy, particularly the BC govt.** Electricity generation from run-of-river ('ror') hydro power projects are playing a large role in the growth of renewable power generation in Canada. It is expected that renewable energy capacity will double in the next decade as federal and provincial governments adopt policies to promote the expansion of renewable power generation and as demand for electricity increases. Renewable energy projects provide less than 5% of Canada's electricity but most provinces are mandating minimum targets for new power generation from renewable sources. BC is the most aggressive with a 90% target by 2016.

**We expect upwards of $3B to be invested in run-of-river over the next ten years.** Run-of-river hydropower is considered a low-impact renewable energy that can be produced at a low cost – in line with traditional wholesale electricity prices in Canada of $0.05-0.10/kWh. The largest cost to develop a 'ror' project is the upfront capital costs which currently range from $2-3M/MW; operating costs run at up to 20% of revenues. With the expected development of a number of 'ror' projects in the future, this suggests billions of dollars of investment will be required (10-100MW projects could cost ~$3B).

## *INITIATING COVERAGE:*

### *Plutonic Power Corporation (PCC—T, $7.60)*

*SECTOR OUTPERFORM; Target: $10.00; Risk: SPECULATIVE*

Plutonic Power Corp. (PCC-T) is a run-of-river developer in BC with one of the largest 'ror' power development portfolios. PCC is currently in the construction phase of 196MW projects (East Toba/Montrose) with financial partner GE Energy Financial Services (a unit of GE; NYSE-GE) for a total cost of $660M. The projects are expected to be operational in 2010. We value PCC using a probability adjusted discounted cash flow model to derive a price target of $10.00. The sensitivity of the share valuation to assumptions is very high, placing a range about the target price of $6.42 to $14.48. Our weighted average project attrition rate assumptions produce a target price range of $8.78 to $10.98.

### *Run of River Power Inc. (ROR—V, $0.41)*

*SECTOR OUTPERFORM; Target: $1.25; Risk: SPECULATIVE*

Run of River Power Inc. (ROR-V) is a developer of run-of-river hydro power projects in BC, with one operational project under a 20-year contract with BC Hydro and a portfolio of about 12 additional projects. The operating project at Brandywine Creek is currently producing ahead of projected capacity, with revenues of ~$2M/year. We value ROR using a probability adjusted discounted cash flow model to derive a target price of $1.25. The sensitivity of the share valuation to assumptions is very high, placing a range about the target price of $0.15 to $2.14. Our weighted average project attrition rate assumptions produce a target price range of $1.09 to $1.40.

**Public Company Watchlist:** Boralex (BLX-T); Canadian Hydro Developers (KHD-T); Great Lakes Hydro Income Fund (GLH.UN-T); Innergex Renewable Energy; Synex International (SXI-T)

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# TABLE OF CONTENTS

**EXECUTIVE SUMMARY** ..... **4**

**PLUTONIC POWER CORP. – (PCC-T; SECTOR OUTPERFORM; TP: $10.00)** ..... **5**

INVESTMENT SUMMARY ..... 5
VALUATION ..... 5
OPPORTUNITIES ..... 6
RISKS ..... 7
CRITICAL SUCCESS FACTORS ..... 7
KEY CHALLENGES ..... 8
UPCOMING EVENTS/CATALYSTS ..... 8

**RUN OF RIVER POWER CORP. – (ROR-V; SECTOR OUTPERFORM; TP: $1.25)** ..... **9**

INVESTMENT SUMMARY ..... 9
ROR DIVERSIFIES ITS RENEWABLE PORTFOLIO ..... 10
VALUATION ..... 10
OPPORTUNITIES ..... 10
RISKS ..... 11
CRITICAL SUCCESS FACTORS ..... 12
KEY CHALLENGES ..... 12
UPCOMING EVENTS/CATALYSTS ..... 13

**WHY INVEST IN RUN-OF-RIVER DEVELOPERS** ..... **14**

WHO ARE THE COMPETITORS? ..... 14
RECENT M&A ACTIVITY ..... 16

**RUN-OF-RIVER HYDROELECTRIC POWER** ..... **17**

SUPPLYING POWER IN CANADA ..... 18
RENEWABLES – THE FEDERAL INITIATIVE ..... 18
SUPPLY BY PROVINCE ..... 19
SMALL VS. LARGE PROJECTS ..... 21
A CLOSER LOOK AT SMALL HYDRO PROJECTS ..... 22
HOW DOES A RUN-OF-RIVER DEVELOPMENT WORK? ..... 23
WHAT MAKES A GOOD RUN-OF-RIVER PROJECT SITE? ..... 24
CAPITAL COSTS FOR RUN-OF-RIVER PROJECTS ..... 26

**FOCUSING ON BC** ..... **27**

THE BC GOVERNMENT'S ENERGY PLAN ..... 27
BC HYDRO OPEN CALLS FOR POWER ..... 29
FROM DESIGN PLANS TO THE ELECTRICITY GRID ..... 35

**PLUTONIC POWER CORPORATION (PCC–T, $7.60)** ..... **41**

**PCC BUSINESS OPERATIONS** ..... **44**

EAST TOBA RIVER/MONTROSE CREEK PROJECT – GREEN POWER CORRIDOR PHASE I ..... 45
THE COMPONENTS OF THE CONSTRUCTION PROJECT INCLUDE: ..... 48
RAINY RIVER PROJECT ..... 49
PCC'S DEVELOPMENT PIPELINE ..... 50

AN ACQUISITION CANDIDATE ..... 53

**FINANCIALS ..... 53**

CONTRACTED PROJECT REVENUE ESTIMATES ..... 53
PROJECT VALUATIONS ..... 54
VALUATION AND TARGET PRICE ..... 55

**RUN OF RIVER POWER INC. (ROR–V, $0.41) ..... 56**

ROR DIVERSIFIES ITS RENEWABLE PORTFOLIO ..... 57

**ROR BUSINESS OPERATIONS ..... 59**

BRANDYWINE CREEK ..... 59
ROR'S DEVELOPMENT PROJECT PORTFOLIO ..... 62
UPPER PITT RIVER POWER CLUSTER ..... 62
MAMQUAM POWER CLUSTER ..... 67
FUTURE DEVELOPMENTS ..... 68
WESTERN BIOMASS ..... 69
AN ACQUISITION CANDIDATE ..... 70

**FINANCIALS ..... 71**

OPERATING PROJECT VALUATION ..... 71
DEVELOPMENT PROJECT VALUATIONS ..... 71
VALUATION AND TARGET PRICE ..... 73

**PEER WATCH LIST ..... 74**

**INVESTMENT HIGHLIGHTS – BORALEX INC. (BLX–T) ..... 75**

CURRENT ASSETS: ..... 75
DEVELOPMENT PIPELINE: ..... 75
GEOGRAPHIC DIVERSIFICATION ..... 76
ENERGY PORTFOLIO ..... 77
CATALYSTS ..... 78
HISTORICAL REVENUE AND ELECTRICITY OUTPUT ..... 79
GROWTH PROFILE ..... 79
CONSENSUS ESTIMATES ..... 79
RISKS ..... 79

**INVESTMENT HIGHLIGHTS – CANADIAN HYDRO DEVELOPERS INC. (KHD–T) ..... 80**

GEOGRAPHIC DIVERSIFICATION ..... 82
ENERGY PORTFOLIO ..... 83
CATALYSTS ..... 83
HISTORICAL REVENUE AND ELECTRICITY OUTPUT ..... 83
RISKS ..... 84

**INVESTMENT HIGHLIGHTS – GREAT LAKES HYDRO INCOME FUND (GLH.UN –T) ..... 85**

GEOGRAPHICAL DIVERSIFICATION ..... 86
PORTFOLIO ADDITIONS ..... 86
RISKS ..... 87

**INVESTMENT HIGHLIGHTS – INNERGEX RENEWABLE ENERGY (IEF.UN–T) ..... 88**

NEW ENTRANT POSITIONED FOR GROWTH ..... 88
DEVELOPMENT CAPACITY – LONGER TERM VALUE CREATION ..... 90

CATALYSTS ..... 91
RISKS ..... 91

**INVESTMENT HIGHLIGHTS – SYNEX INTERNATIONAL INC. (SXI–T) ..... 92**

AN INTEGRATED RUN-OF-RIVER COMPANY ..... 92
CATALYSTS ..... 93
RISKS ..... 93

**APPENDIX A: THE BC 2006 CALL FOR POWER ..... 94**

CALL AWARD VOLUMES ..... 94
COST EFFECTIVENESS ..... 95
RATE IMPACT ..... 95

**APPENDIX B: THE BC 2002/3 CALL FOR POWER ..... 97**

**APPENDIX C: THE BC HYDRO 2000/01 CALL FOR POWER ..... 98**

**APPENDIX D: ENERGY CONVERSION TABLE ..... 99**

**APPENDIX E: RUN-OF-RIVER GLOSSARY ..... 100**

**APPENDIX F: REFERENCES ..... 103**

**DISTRIBUTION** ..... 105
**ANALYST CERTIFICATION** ..... 105
**IMPORTANT DISCLOSURES** ..... 105
**RATING STRUCTURE** ..... 105
**RISK PROFILE PARAMETERS** ..... 106
**DISCLAIMERS** ..... 107

# EXECUTIVE SUMMARY

- **Run-of-river hydro power generation is a low-cost source of electricity generation (see Figure 2 on page 21) with very low environmental impact**. Political and regulatory support from both federal and provincial governments support the advancement of run-of-river hydro projects in regions across Canada. Mandates for clean, renewable energy sources and energy self-sufficiency are driving growth in the industry. While the majority of run-of-river hydro sites are well mapped out, many have yet to be developed, providing potential value to prospective developers.
- We believe this is an attractive area with upwards of $3B of investment in projects expected in the near to medium term. The paybacks on projects suggest positive economic opportunities with potential returns of up to 20% on projects (levered).
- With a number of Calls for Power completed by BC Hydro and successful interconnections by IPP's to BC transmission lines, BC Hydro is structuring another series of Calls for Power in 2008 (see Page XX) and 2009. During H2 2008, key catalysts for renewable energy power producers with operations in British Columbia include the Clean Power Call, the Standing Offer Program and the Bioenergy Call for Power.
- We have also seen increased M&A activity within the renewable energy sector and expect that companies with contracted projects and development portfolios may potentially be acquisition targets for those looking to expand portfolios or acquire emissions offsets.
- **Plutonic Power Corp. (PCC-T; Sector Outperform; PT: $10.00), one of the few pure-play run-of-river hydro companies in Canada,** expects to gain a number of EPA contracts in the BC Hydro Clean Power Call, after having won two contracts in the 2006 Call for Power. We believe that PCC has proven its ability to win EPAs and successfully negotiate agreements with First Nations communities, financial partners and contractors. While we have not seen PCC operate a commercial run-of-river project, we believe that it is on track to do so, with many of the development hurdles behind it. Further, with the creation of a new transmission line for interconnection with BCTC, some of the uncertainty for other projects' interconnection requirements will be reduced. We expect PCC to be awarded multiple EPAs in the upcoming Clean Power Call for its ~1.5GW portfolio of development projects.
- **Run-of-River Power Inc. (ROR-V; Sector Outperform; PT: $1.25), already has an operational run-of-river project site under an EPA contract with BC Hydro, generating ~40GWh of electricity annually**, and providing annual revenues of about $2 million. ROR has also expanded its renewable power base with the acquisition of Western Biomass, focused on supplying power through the biorefining of wood feedstock and wood wastes.

  With its first run-of-river hydro site operating well ahead of projected capacity for about a year now, ROR has gained the necessary experience to support development of its future projects. We anticipate ROR will be awarded EPA contracts in the Clean Power Call and perhaps the Standing Offer Program (SOP), driving future growth for the company. One primary risk factor in the currents plans for development of ROR's Pitt River projects is attaining an allowance through designated Parkland property for transmission lines. However, ROR has made an interesting proposal to circumvent any potential loss of preserved green space with these plans.

  Western Biomass is still at very early stages of development, however given the relationship with Tsilhqot' First Nations for access to feedstock supply and to a site location to build the plant, we could see ROR with an EPA award in the Bioenergy Call next year.

# PLUTONIC POWER CORP. – (PCC-T; Sector Outperform; TP: $10.00)

## *Investment Summary*

BC Hydro forecasts energy demand in BC to grow by 25% to 45% over the next twenty years, while the trajectory of current supply capacity falls significantly short of that (25,000GWh shortfall in 2020). BC Hydro estimates that currently contracted clean electricity sources can be expected to meet just 41% of BC's incremental energy demand over the next 10 years. To help meet this demand growth, BC Hydro has come to rely on independent power producers (IPPs) to help mitigate the projected supply side energy deficit. Further to this forecast, the 2007 BC Energy Plan has the province committing to eliminate this deficit by 2016 as well as becoming completely energy self-sufficient by adopting cleaner, zero emission, and renewable energy technologies.

PCC is well positioned to benefit from this projected need and regulatory mandate in BC with the largest portfolio of run-of-river projects in the province. PCC's portfolio includes 34 Run of River projects in development (1.7GW capacity with 5,500GWh of annual electricity) that are expected to be advanced and contracted to supply the province with additional power over the next several years. There are 27 projects within the "Green Power Corridor" (GPC) with an estimated potential capacity of ~1.5GW, many of which are expected to be tendered into BC's Clean Power Call, and two contracted projects (East Toba, 123 MW and Montrose, 73 MW), both granted 35-year term Energy Purchase Agreements (EPAs) with BC Hydro in the 2006 Call for Power. PCC has successfully attained a provincial Environmental Assessment Certificate for these two projects and the transmission line, signed an impact benefits agreement with Klahoose, Sliammon and Sechelt First Nations, attained interconnection agreements with BCTC, secured financing with GE Energy Financial and negotiated a fixed-price construction contract with Peter Kiewit Sons Co (Kiewit) that is expected to move the projects to commercial operation in mid-2010.

We currently value the East Toba/Montrose projects at about $1.70 per share, assuming a discount rate of about 10%. We estimate the upside potential from PCC's uncontracted portfolio of projects, which include roughly 1.5GW of capacity, to be $8.08 per share. The nearer term projects, which we expect will be submitted into the Clean Power Call in BC are valued at $6.35 per share.

A key catalyst for PCC in the near term is the upcoming BC Hydro Clean Power Call from which we expect PCC to be awarded multiple long-term EPA contracts for its other sites targeted for operation in the 2010-2015 timeframe. While PCC is competing with other run-of-river IPPs, as well as those with other technologies for electricity generation, run-of-river projects typically dominate the wins for EPAs (in the 2006 Call for Power about 60% were run-of-river projects). In addition, with the Clean Power Call size of 5,000GWh and a potential adjustment for expected attrition/delays of 15-40%, we would expect issued contracts to surpass the targeted Call size. As such, we expect a majority of projects entered into the Clean Power Call are likely to be awarded EPA contracts.

## *Valuation*

PCC does not have an operating history as a power generating company but has been focused on the development of a number of run-of-river hydro projects in BC With 196MW of electricity contracted under a 35-year EPA with BC Hydro, a financial partnership with GE, secured project financing and a fixed price construction contract, PCC is set to transition from an early stage renewable power company to an emerging revenue generating Independent Power Producer (IPP)

with a large pipeline of projects (over 1.5GW) that are well positioned to come on line in the medium term (a project can take anywhere from 2 to 5 years to develop).

We are initiating coverage of Plutonic Power Corporation with a target price of $10.00 per share, which translates into a Sector Outperform rating. We expect the next critical milestones that are likely to drive long term value for the company are the announcement of its tender of a number of projects into the Clean Power Call (formerly the 2007 Call for Power) and any resulting EPA's to be awarded (expected mid-2008).

## *Opportunities*

- **EPAs from BC Call for Power 2006** – The East Toba/Montrose projects were awarded a 35-year contract by BC Hydro in the 2006 Call for Power is expected to come on stream mid-2010; construction has begun and PCC is on track to become a revenue generating business in 2010.
- **BC Hydro Clean Power Call (formerly the 2007 Call for Power)** – Approximately 5,000GWh of capacity is expected to be awarded in the Clean Power Call this time. Even though BC Hydro has provided for contract submissions for alternate technologies this year, we continue to expect that a majority of the awards will be to run-of-river projects and it is likely the total award volume will exceed the target. We expect PCC will be successful in attaining EPA contract awards for its submissions in the Clean Power Call. We note that the draft terms for this Call have recently been issued and expect them to be finalized in the near term.
- **Expansion to other provinces** – While this is not currently a focus for PCC given its sizeable portfolio within the province of BC, we expect there is always the possibility for expansion into other provinces with similar Calls for Power to those issued in BC.
- **Acquisition of additional projects** – We expect PCC is constantly searching for appropriate projects to expand its portfolio and further utilize the infrastructure the company is building in BC.
- **Diversify supply sources** – It is not unreasonable to expect PCC to diversify its sources of supply to include alternate renewable energy sources outside of its run-of-river projects.
- **Supply of power to neighbours including the north western U.S. and Alberta** – Once the long-term contracts for power issued by BC Hydro have expired, we expect PCC may provide power to the open market. We note that in the draft terms for the Clean Power Call BC Hydro has proposed the option to acquire the rights to projects at market values upon EPA expiry. We expect this to be a contentious issue as the draft terms are discussed in more detail.
- **Federal incentives for renewable energy suppliers** - Under the federal ecoEnergy Renewable Power Program incentives, Ottawa has budgeted $1.5B for green projects over 14 years; zero-emission, green energy projects (including run-of-river hydro) will receive an incentive of $0.01 per kWh ($10 per MWh) for up to 10 years for eligible projects constructed over the next four years (until March 31, 2011); we expect PCC's East Toba/Montrose project to qualify under this program.

## *Risks*

- **Ability to complete construction of projects on time and within budget under the EPAs from the 2006 BC Hydro Call for Power** – This is mostly mitigated through the fixed price contract set with Kiewit for the build of the East Toba/Montrose power stations; however, there could reasonably be timing delays through the construction process.

- **Ability to attain additional EPAs in future Calls for Power** – We expect this is a relatively low risk given that PCC has succesfully executed on its 2006 EPA and is expected to begin supplying power mid-2010, showing commitment to its contract bids. Future bid prices will continue to be a driving factor in EPA allocation particularly as run-of-river projects become more complex (the terrain is difficult and location not ideal) while the economics of other competing technologies (solar/wind etc) may improve over time.

  We note that one limiting factor for run-of-river hydro projects is that the peak production period is in the freshet period (April through September), which overlaps with BC Hydro's peak production periods. While intermittent producers are still necessary to meet demand during the freshet period, supply constraints are somewhat less during that time of year.

- **Ability to attain approval for the operation of new projects** – As the number of projects increases, management of the growing complexity of attaining water licenses, the environmental permitting process and interconnection process for the commissioning of projects will likely become more difficult. Furthermore, the projects themselves become more complex as presumably the lower cost/easier to construct projects are likely to be contracted first and the more difficult/more expensive projects are likely to be contracted in later Calls for Power.

- **Ability to pass the permitting process for each project with environmental and water licenses** – This process is likely to become more and more complex and the hurdles may even get higher as more run-of-river projects are approved in BC. There already are significant concerns about the cumulative effects of a number of run-of-river projects within a small region, however the impacts are clearly not well understood. Fear of future ramifications seems to be driving these concerns at the moment.

- **Ability to operate and maintain a large number of projects as the company expands**

- **Ability to attain funding for additional projects and to successfully construct those projects within budgets**

- **Ability to attain agreements with First Nations communities to operate projects** – We expect that experience with early project approvals from First Nations will assist in building strong retelationships over time, as many of the future projects are likely to impact many of the same First Nations communities involved in East Toba/Montrose projects.

## *Critical Success Factors*

- **Projects and Contracts** - Build a large portfolio of project development sites and develop pricing efficiency such that EPA contracts under a Call for Power will be awarded.

- **Management -** Complete the construction of projects on time and within budget; this requires an experienced management team, with strong negotiating skills.

- **Relationships –** Developing strong relationships with regulators, First Nations communities and financial partners is critical to the ongoing success of projects.

## *Key Challenges*

- While PCC's portfolio of development projects present an attractive entry into the upcoming Call, and management has previoudly executed on its plans to develop the East Toba/Montrose projects, the company has not yet managed an operational project. Gaining this experience for the build and operation of many projects in the future will be critical for long term success.
- There are always challenges in increasing the size or quality of its future development pipeline to feed growth and valuation in the stock - doing so would require either JV partnerships to fund the equity portion of any acquisitions or relying on other funding arrangements so as to limit the risk of further equity dilution through an acquisition via cash and shares

## *Upcoming Events/Catalysts*

- H1 2008 – Submissions to the BC Hydro Clean Power Call (formerly the 2007 Call for Power)
- H2 2008 – Implementation of the Clean Power Call and the awarding of contracts to IPPs
- H2 2008 – Issuance of contracts (EPAs) to PCC for a stated number of MW
- 2008 – Progress on permitting process for projects submitted to the Clean Power Call including updates on First Nations relationships
- 2008 – Progress to secure financing or JV partnerships for projects awarded contracts in the Clean Power Call

# RUN OF RIVER POWER CORP. – (ROR-V; Sector Outperform; TP: $1.25)

## *Investment Summary*

Run of River Power Inc. (ROR) operates the 7.6MW Brandywine Creek run-of-river hydroelectric power generation station in British Columbia. ROR was awarded a 20-year EPA with BC Hydro in the 2000/01 Call for Power and began operations at the facility during May 2005. Revenue began accruing to ROR on August 2, 2005. The project generates approximately $2M in revenue and $1.7M in EBITDA annually (assuming ~40GWh of production) now that it is running ahead of projected capacity on an annual basis. ROR also has a development portfolio of 13 additional run-of-river projects, 9 of which are to be submitted into the upcoming BC Hydro Clean Power Call which is targeting a minimum 5,000GWh/year of power, and 2 into the Standing Offer Program (SOP). These 11 near-term development projects are situated within two power clusters, representing a design capacity of 194MW with generation potential of over 670GWh of renewable, green power annually - the 161MW Upper Pitt River and the 33MW Mamquam power clusters. The submission of these projects into the upcoming Clean Power Call/SOP and potential award of long-term EPAs from BC Hydro represents additional upside value potentially realizeable in the near to medium term for ROR. We expect that projects within each power cluster are likely to share infrastructure and development costs, potentially presenting cost advantages and efficiencies that attractively position ROR's submission into the Clean Power Call and SOP.

As the company successfully progresses through each step of the project commissioning process, uncertainty and risk diminishes, unlocking and driving value going forward. As it stands today, the market appears to give little value to ROR for projects outside of its operating Brandywine Creek project. The Brandywine Creek project has been operating well ahead of projected capacity (~40%) in recent months and projections for future performance remain strong – a very different prospect from a year ago when ROR had to shut the project down to fix a bacteria problem that had developed in the steel portion of the penstock.

A key catalyst for ROR in the near term is the upcoming BC Hydro Clean Power Call into which we expect ROR to submit ~177MW of development projects. Following this event, a major catalyst within the investment horizon (assuming the projects are awarded an EPA from its submission into the Call) would be a successful amendment to the Pinecone Provincial Park boundary (through which a transmission line from the Upper Pitt River project is to run) or land use permit to allow the poles securing the transmission line to occupy Provincial Park lands (visual quality and biological issues at play). Legislative approval for this park crossing allowance, if successful, would be expected to happen late spring/early summer 2008. Additional potential upside for ROR are its additional projects (~17MW) that may be submitted into the Standing Offer Program for projects under 10MW in size and development projects that may be submitted in future Calls for Power. The SOP is being offered by BC Hydro almost concurrently with the Clean Power Call but is being offered with slightly different terms to accommodate the smaller projects. We value the projects in ROR's pipeline at $1.13 per share assuming an attrition rate of 15-40% (in line with previous Calls for Power in BC), a debt to equity raise of 80:20 and a discount rate of about 10%. Upside to our valuation lies in the probability of success as projects within the development pipeline move closer to production with EPA awards, permitting secured, First Nations agreements established, interconnection agreements signed, project financing arranged and construction contracted.

## ROR Diversifies its Renewable Portfolio

More recently (August 2007), ROR purchased the outstanding shares of Western Biomass in a 3.8 million share swap valued at just under $2.5 million. About 67% of the shares release from under escrow as key milestone targets are met. We note that CFO of ROR, Michael Sweatman, was a 17.4% shareholder and Director Rick Hopp was a 6.2% shareholder of the private company prior to the acquisition of its shares.

The business strategy at Western Biomass includes plans for wood fired plants to produce electricity for the BC grid. The supply of feedstock would be provided in regions where trees have been destroyed by the pine beetle in the province, in addition to logging and mill wastes. Plants would be constructed near the supply of feedstock to avoid excessive costs for transportation. As it is, there will be costs associated with the collection of the wood affected by the pine beetle. Initial plans are for the construction of a 50MW to 100MW plant located within the territories of the Tsilhqot'in National Government (TNG), the First Nations territories located west of Williams Lake, BC. A formal letter of intent exists between Western Biomass (assumed now by ROR) and TNG and progress is being made towards finalizing the terms for a joint venture development of this project. It is expected that Western Biomass is likely to submit a bid in the separate Bioenergy Call for Power in 2008 announced by BC Hydro for wood based biomass generated power only. We currently do not give value to ROR for the potential projects in development at Western Biomass, given the early stage of development. We expect that once there is more clarity with respect to the joint venture with TNG and progress on the feasibility studies for the first wood fired plant there may be a more direct path forward to revenue generation.

## *Valuation*

ROR is a development company with a short operating history as a power generating company with its 7.6MW Brandywine Creek power generating station.

ROR is also now transitioning from being an early stage development company to an emerging revenue generating Independent Power Producer (IPP) with a moderately sized pipeline of projects (over 196MW) that are well positioned to come on line in the medium term (provided all 196MW are awarded EPA's in the upcoming call, it is proposed they be built sequentially from 2009 through 2012 and completed in 2015).

We are initiating coverage of Run of River Power Inc. with a target price of $1.25 per share, which translates into a Sector Outperform rating. We expect the next critical milestones that are likely to drive long term value for the company are the announcement of its tender of 196MW of power projects into the Clean Power Call (formerly the 2007 Call for Power) and any resulting EPA's to be awarded (expected early 2008) followed by an amendment to the Pinecone Burke Provincial Park allowing for a section of the Upper Pitt River project's (provided it is awarded an EPA) transmission line to pass through an approximately 4km portion of it.

## *Opportunities*

- **Current projects operating under EPAs** – Brandywine Creek 7.6MW power generation plant is operating ahead of projected capacity under a 20-year EPA from BC Hydro.
- **B.C Hydro Clean Power Call (formerly the 2007 Call for Power)** – We expect ROR to be awarded at least one EPA under this Call for Power, given a submision of projects totalling 194MW in capacity. We note that the draft terms governing the Clean Power Call were recently released for public comment and discussion. We expect the terms to be finalized in the near term.

- **The BC Open Call, or Standing Offer Program (SOP) for projects up to 10 MW** – ROR has two such projects in development, the 10MW Raffuse and 7MW Crawford projects which we expect will be submitted to the SOP.
- **Future developments projects** – 16MW run of river hydro and 50 to 100MW biomass potential is currently in ROR's pipeline for development.
- **New projects** – Acquisition potential of additional projects within run-of-river or biomass or other renewable resources.
- **Supply of power to neighbours including the north western U.S. and Alberta** – BC is a net importer of electricity; once the long-term contracts for power issued by BC Hydro have expired, we expect ROR may provide power to the open market. We note that in the draft terms for the Clean Power Call BC Hydro has proposed the option to acquire the rights to projects at market values upon EPA expiry. We expect this to be a contentious issue as the draft terms are discussed in more detail.
- **Federal incentives for renewable energy suppliers** – Under the federal ecoEnergy Renewable Power Program incentives, Ottawa has budgeted $1.5B for green projects over 14 years; zero-emission, green energy projects (including run-of-river hydro) will receive an incentive of $0.01 per KWh ($10 per MWh) for up to 10 years for eligible projects constructed over the next four years (until March 31, 2011). We expect that ROR's Upper Pitt River and Mamquam power projects may qualify under this program.
- **BC Hydro Bioenergy Call for Power** – This is targeted at projects utilizing the pine beetle killed tree supply; ROR Western Biomass division has agreements with First Nations for access to wood feedstock in BC and is working towards a joint venture with the community for the build of a biorefinery to supply power to BC Hydro under a potential EPA.

### *Risks*

- Ability to secure necessary licensing and land tenure agreements or allowances
- Ability to attain agreements with Katzie and other First Nations communities to drive project development
- Ability to attain environmental assessment certificates, interconnection agreements with BCTC and water licenses for future projects
- Ability to submit a cost competitive bid to the BC Hydro Clean Power Call/SOP and be awarded an EPA on all 194MW
- Securing favourable project financing or joint venture agreements that would mitigate further share dilution
- Ability to negotiate and attain amendment to Pinecone Burke Provincial Park boundary for allowing transmission line from Upper Pitt River through the park – this is a key binary event for ROR; should the allowance through the National Park not be allowed, ROR would have to revert to the drawing board for other alternatives
- Ability to complete construction of projects on time and within budget
- Ability to attain additional EPAs in future Calls for Power (SOP as well) to feed development pipeline and drive value

- We note that one limiting factor for run-of-river hydro projects is that the peak production period is in the freshet period (April through September), which overlaps with BC Hydro's peak production periods. While intermittent producers are still necessary to meet demand during the freshet period, supply constraints are somewhat less during that time of year.
- Ability to operate and maintain a number of projects as the company expands
- Ability to attain funding for additional projects and to build out those projects within budgets

### *Critical Success Factors*

- **Projects and Contracts** – Build a large portfolio of project development sites and develop pricing efficiency such that EPA contracts under a Call for Power will be awarded. In particular, the awarding of EPA's on the 194MW submision to the Clean Power Call are key drivers to long term growth.
- **Unique environmental factors** – Pinecone Burke Provincial Park boundary amendment needs to be approved to support our valuation within the investment horizon.
- **Management** – Complete the construction of projects on time and within budget; this requires an experienced management team, with strong negotiating skills.
- **Relationships** – Developing strong relationships with regulators, First Nations communities and financial partners is critical to the ongoing success of projects.

### *Key Challenges*

- While ROR's portfolio of development projects present an attractive entry into the upcoming Call, the coordination of permitting, licensing, project financing and legislative requirements (Pinecone Burke) to build all projects within the proposed timeline and on budget presents a significant task to execute from a management team experienced in building and operating one relatively small run of river hydroelectric project (7.6MW Brandywine Creek).
- ROR's proposal for its projects includes an amendment to the Pinecone Provincial Park boundary (through which a transmission line from the Upper Pitt River project is to run) or land use permit to allow the poles securing the transmission line to occupy Provincial Park lands. ROR has proposed that it provide another area of land to be designated Park Land in lieu of that to be occupied by the Park crossing. Without this land use permit, ROR would have to select an alternate route for its tranmission lines, which would likely be more costly. Legislative approval for this park crossing allowance, if successful, would be expected to happen late spring/early summer 2008.
- ROR also faces challenges in increasing the size or quality of its future development pipeline to feed growth and valuation in the stock - doing so would require either JV partnerships to fund the equity portion of any acquisitions or relying on other funding arrangements and not risk further equity dilution through an acquisition via cash and shares.

## *Upcoming Events/Catalysts*

- H1 2008 – Submissions to the BC Hydro Clean Power Call (formerly the 2007 Call for Power)
- Q1 2008 – MOU with First Nations
- H2 2008 – Implementation of the Standing Offer Program for <10MW projects
- H2 2008 – Implementation of the Clean Power Call and the awarding of contracts to IPPs
- H2-2008 – Issuance of contracts (EPAs) to ROR for a stated number of MW
- Mid-2008 – Amendment to the Pinecone Burke Provincial Park boundary
- H2 2008 – Decision regarding Environmental Assessment Certficate
- H2 2008 – Implementation of the Bioenergy Call
- 2008/09 – Secure project financing or JV agreements to advance project development

# WHY INVEST IN RUN-OF-RIVER DEVELOPERS

While there are many small hydro and run-of-river developers and operators, there are few publicly traded pure-play run-of-river companies. It can be argued that BC presents the greatest near-term opportunity to develop run-of-river hydro on a scale greater than anywhere else in Canada especially if considering BC's geography (steep mountains, high rainfall and proximity to Greater Vancouver's energy demands). The few publicly traded run-of-river companies are also well positioned to win electricity purchase agreements (EPAs) in the BC Hydro Clean Power Call, improving the outlook for investors on a risk/reward basis. As an added benefit, this will increase clarity into the near to medium term revenue prospects by the winners of contracts in the Call. The Call for Tender is expected in summer 2008, with the selected contract winners expected to be announced in the fall of 2008. Upon winning a contract IPPs typically receive a 15-40 year electricity purchasing contract from BC Hydro. We note that in the draft terms released for the Clean Power Call, BC Hydro proposed that it retain an option upon EPA expiry to acquire the project at the market price. We expect this to be a contentious issue in discussions over the draft terms, as there can be significant value in a project after the expiry of its first EPA. We expect BC Hydro is attempting to address the issue of long term security of its electricity supply with this proposal.

In the Clean Power Call, we still expect run-of-river projects to dominate in the EPA contract awards. However, we note that BC Hydro has expressed an interest in the development and operation of wind projects this year and has been conducting studies on the viability of wind projects in BC, with results due before year end. As such, we expect that wind projects will take a greater portion of the EPA contract awards in this Call for Power than ever before, particularly as BC Hydro attempts to diversify its power supply base. Furthermore, BC Hydro has stipulated in the draft terms for the Clean Power Call that it intends to limit the purchase of power during freshet (May through September) to 20-25% of its total annual energy supply. The limi was previously one-third in the 2006 Call for Power. This is positive for wind proejcts because peak load periods are offset from that of hydro.

Overall, we believe that run-of-river projects will continue to flourish in suitable geographic regions of Canada because of the cost of supply, and the neutral to positive impacts to the environment. This is supported by the government driven Calls for Power requesting applications from producers with green projects only in order to compensate for the expected power supply gaps in the future. The pricing in these upcoming Calls for Power are expected to continue increasing reaching as high as $100-125/MWh.

## *Who are the competitors?*

In terms of bidding for contracts, companies supplying alternative energies compete across the sub-sectors of alternative energy but also within the sub-sector. So, run-of-river projects will compete directly with solar, wind, wave and biomass projects to a degree, as often guidelines dictating the energy source are not predetermined.

Key competitors in this Canadian market include pure-play run of river hydro developers Great Lakes Hydro Income Fund (GLH.UN-T), Plutonic Power Corp (PCC-T), Run of River Power Inc. (ROR-V) (though it also recently acquired a Biomass asset), and Synex (SXI-V), as well as a number of companies developing/operating both run of river and wind farm projects (and some biomass as well) including (but not limited to) Canadian Hydro Developers (KHD-T), Boralex (BLX-T) and Innergex (IPO not yet closed), plus a number of privately held companies. As the Canadian market is largely made of privately held and early-stage companies, exposure to Canadian run-of-river hydro development is available through either the aforementioned pure-

play public companies or through the small number of Canadian listed energy companies with run of river projects within their portfolios. The other alternative of course is to invest in an energy fund.

## Table 1: Private Hydro Companies in Canada

| Head Office Location & Company Name | Public/Private | Renewable Energy Focus | Projects/MW |
|---|---|---|---|
| **Ontario** | | | |
| Alternative Power Energizing<br>www.alternative-power.ca | Private | Wind, solar,water power | |
| Ontario Power Generation<br>http://www.opg.com | Private | Nuclear, fossil fuels,small hydro, wind | 29 small hydro plants, 3 wind power stations |
| Fortis Ontario Inc (Subsidiary of Fortis Inc: FTS-T)<br>www.fortisontario.com/ | Public | Hydro and small hydro | 5 electric utilities Newfoundland Power, Maritime Electric, Belize Electric, Caribbean Utilities, Fortis Ontario |
| Kinergy Power (Pvt);<br>www.kinergypower.com | Private | Wind, small hydro, wave | |
| Regional Power Inc (Subsidiary of Manulife Financial;<br>www.regionalpower.com/ | Public | hydro, small hydro | 6 plants @ 36 MW |
| Verdant Power<br>www.verdantpower.com/ | Private | Underwater current power generation (river, tide, channels and ocean) | |
| **British Columbia** | | | |
| Cogenix Power Corp. & Global Cogenix Industrial Co | Private | Log Creek 38 MW, Kookipi Creek 39MW | |
| Cloudworks Energy Inc.<br>www.cloudworksenergy.com | Private | Run of river | Rutherford Creek + 16 projects proposed or in development |
| KMC Energy Corp. | Private | Run of river | Proposed 10 MW Tamihi Creek project |
| Kwoiek Creek Resources LP | Private | Run of river | 80MW Kwoiek Creek proposal |
| Remote Structures Inc.<br>www.remotestructures.com | Private | Run of river | 2 projects in development, 11.4 MW |
| Renewable Power Corp.<br>msoprovich@telus.net | Private | Run of river small hydro in BC | 8 MW McNair Creek proposal, 7.5 MW Tyson Creek proposal |
| Run of River Power Inc. (ROR-V)<br>www.runofriverpower.com | Public | Run of river, biomass | 1 operating project (Brandywine 7.6 MW capacity)<br>210 MW potential in development projects |
| Sea Breeze Power Corp. (SBX-V)<br>www.seabreezepower.com/ | Public | Wind and run of river small hydro in BC | 25 MW Cascade Heritage Project (proposed run of river)<br>450 MW capacity proposed Knob Hill Wind Farm |
| Second Reality Effects Inc. | Private | Run of river | 41 MW Fries Creek proposal |
| Sound Energy Inc.<br>www.soundenergy.ca | Private | Run of river | 10 MW Box Creek proposal |
| Spuzzum Creek Power Corp. | Private | Run of river | 21 MW Sakwi Creek proposal |
| Synex Energy Resources Ltd<br>www.synex.com/serl/ | Private | Hydro, diesel and thermal in BC | 11 MW in operation and 20 MW in development |
| Uniterre Resources Ltd. | Private | Run of river, wind | |
| Valisa Energy Inc. | Private | Run of river | 21 MW Serpinetine Creek proposal |
| **Alberta** | | | |
| Canadian Hydro Developers (KHD-T)<br>www.canhydro.com | Public | Wind, water and biomass in ON and BC | |
| Enmax Energy Corporation (Subsidiary of The City O<br>http://www.enmax.com/ | Private | Small hydro, run of river in BC, wind in Alberta | 31 MW run of river, 80 MW wind in development and 76 MW generating wind (McBride Lake) |
| EPCOR Utilities Inc (Epcor Power LP: EP.UN -T)<br>www.epcor.ca; www.epcorpowerlp.ca. | Public | Small Hydro, natural gas,coal and wind | 40 MW wind in development (Kingsbridge) |
| **Quebec** | | | |
| Hydro Quebec<br>www.hydroquebec.com | Private | Hydro, small hydro and wind | |
| SCP Gestion Conseil<br>www.gcscp.com/e_profil.html | Private | Small hydro in QC, Asia, Latin America and Carribean | |
| **New Brunswick** | | | |
| Enterprise Madawaska<br>info@ent-madawaska.ca | Private | Small hydro | |
| **Yukon** | | | |
| Yukon Energy Corporation<br>www.yukonenergy.ca/ | Private | Hydro, small hydro, diesel and wind | 75 MW renewable hydro power |

Source: Company reports, Capital IQ and Haywood Securities

Table 2: Public Hydro and Renewable Energy Companies in Canada

| Haywood Estimates | Ticker | Trdg Curr | Local Price 21-Nov-07 | Pot. Return | % of 52 week Low | % of 52 week High | Mkt. Cap. ($mm) | Revenue CY07E | Revenue CY08E | EPS CY07E | EPS CY08E | P/E CY07E | P/E CY08E | EV/Sales CY07E | EV/Sales CY08E | EV/EBITDA CY07E | EV/EBITDA CY08E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Plutonic Power Corporation | TSX:PCC | CAD | 7.60 | 67% | 304% | 82% | 305 | 0 | 0 | -0.13 | -0.27 | | | | | | |
| Run of River Power Inc. | CDNX:ROR | CAD | 0.41 | NA | 164% | 56% | 25 | N/A | N/A | N/A | N/A | | | | | | |
| **Consensus Estimates** | | | | | | | | | | | | | | | | | |
| Boralex Inc. | TSX:BLX | CAD | 16.32 | 18% | 189% | 84% | 611 | 160 | 165 | 0.58 | 0.74 | 28.3x | 28.6x | 4.4x | 4.3x | 13.7x | 10.8x |
| Canadian Hydro Developers Inc. | TSX:KHD | CAD | 6.40 | 20% | 128% | 80% | 850 | 67 | 97 | 0.06 | 0.12 | NMF | 51.4x | 16.5x | 11.4x | 26.7x | 16.0x |
| EPCOR Power L.P. | TSX:EP.UN | CAD | 21.30 | 18% | 101% | 73% | 1,148 | 581 | 560 | 1.20 | 1.04 | 17.8x | 6.1x | 3.2x | 3.3x | 8.8x | 9.1x |
| Fortis Inc. | TSX:FTS | CAD | 26.70 | 13% | 109% | 89% | 4,147 | 2,407 | 3,291 | 1.35 | 1.57 | 19.7x | 7.8x | 4.2x | 3.1x | 12.1x | 9.5x |
| Great Lakes Hydro Income Fund | TSX:GLH.UN | CAD | 18.80 | 1% | 104% | 87% | 908 | 162 | 173 | 0.73 | 0.91 | 25.9x | 18.0x | 9.2x | 8.7x | 13.2x | 12.2x |
| Innergex Power Income Fund | TSX:IEF.UN | CAD | 12.23 | 10% | 104% | 87% | 302 | 40 | 42 | 0.49 | 0.50 | 25.0x | 24.5x | 10.5x | 9.9x | 13.5x | 12.7x |
| Maxim Power Corp. | TSX:MXG | CAD | 6.28 | 78% | 109% | 74% | 279 | 124 | 137 | N/A | N/A | | | | | | |
| Sea Breeze Power Corp. | CDNX:SBX | CAD | 0.48 | NA | 178% | 68% | 35 | N/A | N/A | N/A | N/A | | | | | | |
| Synex International Inc. | TSX:SXI | CAD | 0.61 | NA | 113% | 86% | 17 | N/A | N/A | N/A | N/A | | | | | | |
| | | | | | | | | | | | **Mean** | **23.3x** | **22.7x** | **8.0x** | **6.8x** | **14.7x** | **11.7x** |
| | | | | | | | | | | | **Median** | **25.0x** | **21.2x** | **6.8x** | **6.5x** | **13.4x** | **11.5x** |

Source: Company reports, Capital IQ and Haywood Securities

## *Recent M&A Activity*

### Taylor buys Highwater Capital

On September 13, 2007, Taylor NGL Limited Partnership (TSX: TAY.UN) acquired Highwater Power Corporation (TSXV: HWP) for cash consideration of $1.50/shr or $9.1 million. The purchase price represents an 81% premium to the VWAP of HWP for the ten trading days ended when the acquisition agreement was announced May 11, 2007.

Highwater Power Corp. had a 25% interest in an operating 7MW run-of-river power generation facility (Boston Bar Generating Station) or 1.8MW and also owned rights to develop two, 10MW run-of-river hydroelectric projects with projected annual production of 77GWh in British Columbia. These two projects (Log Creek and Kookipi Creek) have expected commercial operation dates of November 2010 supplying BC Hydro with power under 40-year EPAs that were awarded in the F2006 Open Call for Power. Both the Log Creek and Kookipi Creek projects are currently progressing through the environmental permitting process. The capital cost for these projects is estimated to be approximately $60 million or about $3M/MW. Taylor expects that commercial operations at both sites will begin in 2010.

With approximately 6.1 million HWP common shares outstanding on a fully diluted basis, the total cost to Taylor was $9.1 million. **HWP had approximately $2.1M in long-term debt and $0.67M in cash, for a total consideration of approximately $10.6M to acquire HWP or about $0.5M/MW (assuming 20MW of potential and 1.8MW interest in a 7MW plant).**

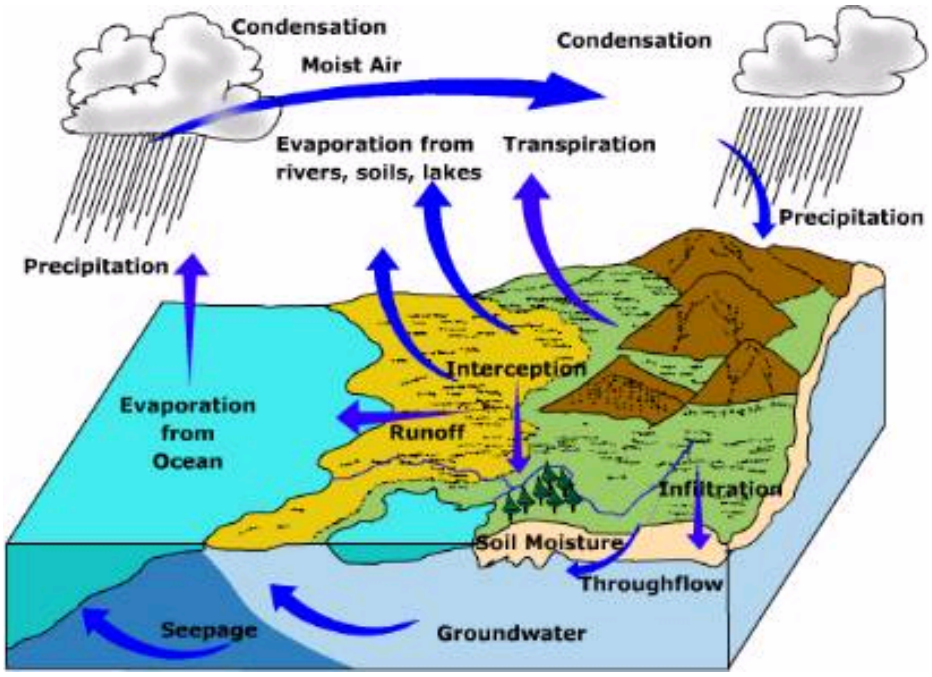
We note that Taylor NGL was recently acquired by AltaGas Income Trust (ALA.UN) for $11.20/unit in cash or 0.42 units of AltaGas per unit of Taylor – a 24% premium to the closing price of Taylor Nov 9, 2007. Taylor owned and operated a natural gas extraction plants, two pipelines in Alberta and run-of-river projects.

# RUN-OF-RIVER HYDROELECTRIC POWER

Accessing energy within the natural water cycle has been the largest source of renewable power around the world and particularly within Canada for many years. Run-of-river hydro power generation has been found to be a cost effective way of supplementing Canada's energy resources with costs in line with that of traditional hydro generation. The benefits of using a sustainable non-polluting power source are significant from both a social and environmental perspective. However, there are some drawbacks when larger scale hydro power projects are constructed, which can change the natural habitat in and around the hydro site. As a result, smaller more environmentally friendly (run-of-river) hydro projects are being developed to supplement traditional power sources.

The natural recycling of the earth's water supply is the hydrologic cycle. It is this cycle that we have tapped into to meet the power supply needs of society. At the start of the hydrologic cycle (movement of water in various states), the sun heats water in the sea and surface water; it is vaporized and the water vapor rises; at higher layers of the air the vapour is cooled and then falls in the form of rain, hail or snow; once on the ground it then flows naturally towards the lowest altitudes through streams and rivers and eventually back into the sea/oceans from where it started. The process then takes place all over again.

Figure 1: The Hydrologic Cycle




Source: www.uwsp.edu/geo/faculty/ritter/glossary/h_k/hydrologic_cycle.html, 'The Physical Environment' by Michael Ritter

Through the harvesting of power from water as it makes it way to the sea/oceans, we can produce electricity without consuming the natural resource itself. The production of hydropower takes advantage of the potential energy in the water and does not depend on the speed of the flow of water. The higher the speed of the flow, the less energy production results because some is lost in the transformation process. The amount of power generated can be represented by the following equation, P=eHQg (P – power in kilowatts; e – efficiency range (0.75-0.88); H – head in metres; Q – design flow in cubic metres/second; g – acceleration of gravity usually (9.81 m/s/s)).

The best locations for generating electricity are waterfalls, rapids, deep valleys, or river bends so that there is sufficient water flow and a reasonably sized distance for the water to fall (known as the head). There are several types of hydroelectric development sites which can be used to harvest electricity including, run-of-river (no storage of water), partial development (water intake on a riverbank rather than a dam), developments with storage, hydro thermal systems (thermal systems boost low water flows; hydro is used in response to rapid load changes), pumped storage (moves water between two reservoirs when demand increases) and multiple purpose projects in addition to electricity supply – irrigation, flood control etc. Our focus in this report is on run-of-river projects in Canada and in particular British Columbia.

## *Supplying Power in Canada*

In Canada, it is expected that increased supply of electricity in the future will almost entirely be provided via an environmentally friendly source. Ideally, we are looking for the ultimate supply characteristics: low cost, reliable source, available on demand, and environmentally friendly. Governments are part of the driving force for this demand with a number of initiatives underway, including legislative regimes and increased regulation to reduce environmental impacts of supplying power. As a result, we have a diverse portfolio of power generation projects, including hydro power (~60% of electrical production), fossil fuels (~30% of electrical production – coal 20%, oil <5%, natural gas <10%), nuclear (10-15% of electrical production) and other sources including wind, bioenergy and solar (<5% of electrical production). Several factors driving increased demand in the future are at play with population growth, economic growth, increased use of electrical tools and appliances, as well as the decommissioning of older power plants outpacing supply levels. Some of this increasing demand may be offset by improved efficiency of energy use (demand side management), but there will likely remain a significant gap over what can reasonably be supplied.

Canada is the world leader in production of low cost hydroelectric energy, with an abundance of water resources across its geography. In 2006 there was 584.4TWh of electricity generated in Canada, with about 60% of that sourced from hydro. Quebec, BC, Manitoba, Ontario, and Newfoundland/Labrador are the largest producers provincially with predominantly large-scale hydro sites supplying most of the electricity to each region on a low cost basis. Outside of the electric utilities owned by the provinces, there are a number of power producers which include industrial companies and pulp and paper producers supplying their own power for operations. In recent years, more and more IPPs have been cropping up across the country, supplying power to the regional grids. With the increase in demand for electricity expected to continue, it is expected that more and more of these projects will be necessary in order to keep up with demand. As such, the interest in the development of renewable resources is at an all time high across the country and around the world. Furthermore, the diversification of energy resources is a key component of government policies as demand grows faster than the supply of fossil fuel discovery.

## *Renewables – The Federal Initiative*

In January 2007, the federal government announced a new initiative, the ecoEnergy Renewable Initiative, to provide an added 4GW of electricity from renewable energy sources, including wind, solar, geothermal, hydro (including run-of-river) etc. A total of $1.5 billion in funding will be invested in the supply of clean electricity from renewable sources. An incentive of $10/MWh will be paid to renewable power projects constructed before 2012 (within 4 years) for a ten year period. An additional $35 million in incentives will be targeted at increasing the adoption of clean, renewable technologies in buildings.

Eligibility criteria under the ecoEnergy Program includes:

- Eligible recipients must sign a contribution agreement with Natural Resources Canada
- An entity that owns a qualifying project to produce electricity for sale in Canada
- A new or refurbished facility (renewable generating) located in Canada (biomass or hydro must be certified ecoLogo)
- Commissioned between April 1, 2007 and March 31, 2011 (wind projects between April 1, 2006 and March 31, 2011)
- Minimum 1MW capacity (wind commercialized after March 31, 2006 minimum is 0.5MW)
- The project must reduce emissions of greenhouse gases and other air pollutants
- The maximum payable amount is $80 million over ten years per project qualified and a $250 million maximum per energy supplier
- Maximum capacity factors apply

Note that this initiative is a fixed annual budget and so max/min apply, and it is administered on a first come, first served basis.

### *Supply by Province*

Traditionally the provinces have been dependent on reservoir hydro power for electricity generation, though Nova Scotia, Saskatchewan and Alberta primarily use coal combustion as a power source. Common sense would suggest that with such diverse landscapes and resources across the country, power supply sources are highly dependent on the regional characteristics and so only a few technologies can be developed cost effectively in any particular province. As a result, it is important for each province to focus on an integrated plan for energy supply in which the primary focus rests on locally available resources. For the most part, very little electricity is traded with neighbouring provinces though there is typically an interconnection with the U.S. that can reach 10-15% of peak generation needs in a province. The issue with running transmission lines between provinces is that the transmission of electricity over long distances does not support project economics unless they can be built near existing power transmission lines (that have free capacity).

If we focus on the environmental footprint of run-of-river technology and its stage of development, it lines up as one of the best performers, with low environmental impacts.

Table 3 Environmental Footprint Comparison

| Technology | Criteria Air pollutants | GHG | Water use impacts | Extraction | Waste | Other | Commercial stage | Dependence on local resource |
|---|---|---|---|---|---|---|---|---|
| **Run-of-river** | none | none | minimal | no | no | can interfere with recreation | commercial | high |
| **Reservoir hydro** | none | low | flow patterns change | no | no | fish migration; flooding | commercial | high |
| **Nuclear** | none | none | thermal discharge | yes | radioactive | high cooling water demand | commercial | low |
| **Natural gas** | low | medium | thermal discharge | yes | no | moderate cooling water demand | commercial | medium |
| **Oil fired generation** | high | high | thermal discharge | yes | yes | moderate cooling water demand | commercial | low |
| **Conventional coal** | high | high | thermal discharge | yes | yes | mod/high cooling water demand | commercial | low |
| **Clean coal with Co2** | low | medium | thermal discharge | yes | yes | increased coal consumption per MWh | demonstration and conceptual | low |
| **Bioenergy** | low | none | low | no | yes | fertiliser for energy crops | commercial/pre-commercial | medium |
| **Geothermal power** | none | low | low | no | yes | odour | commercial | high |
| **Wind power** | none | none | none | no | no | bird/bat kills | commercial | high |
| **Solar PV** | none | none | low | for manufacturing only | no | high energy consumption during manufacture | commercial | low |
| **Tidal current power** | none | none | non-consumptive | no | no | unknown | pilot stage | high |
| **Wave power** | none | none | non-consumptive | no | no | unknown | pre-commercial | high |

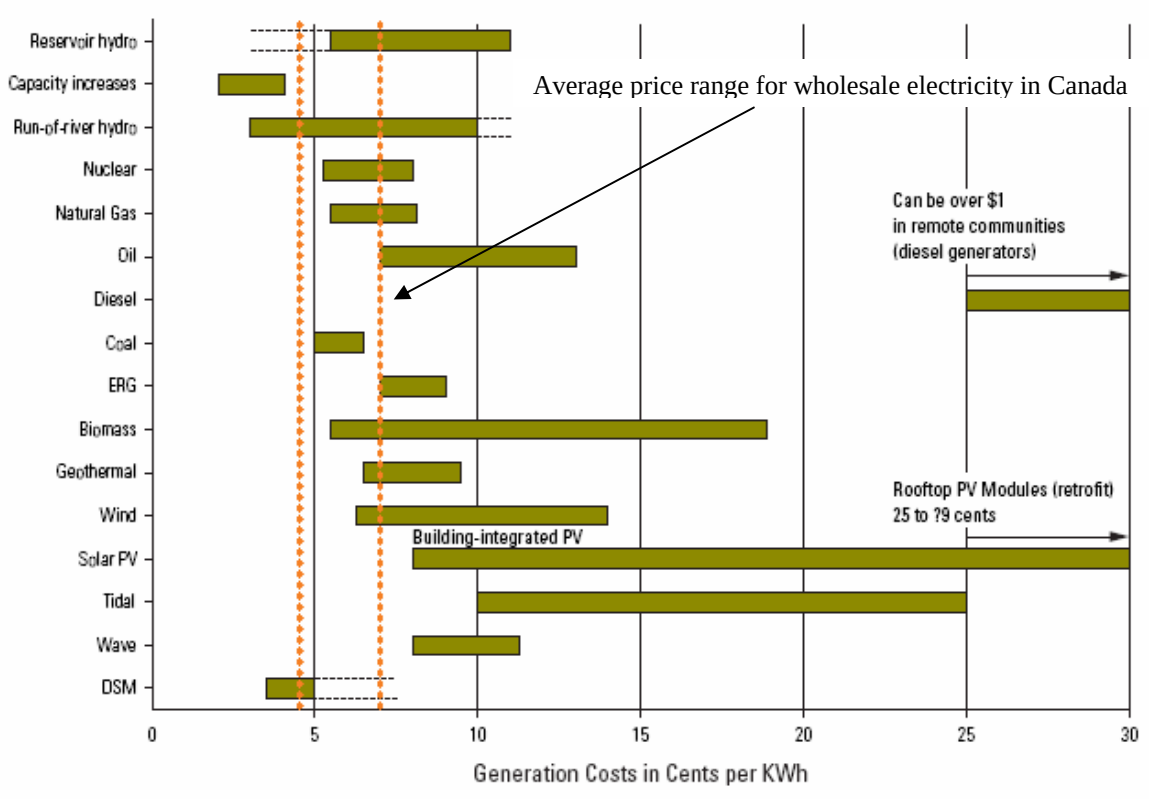
Source: A Guide to Power Generation in Canada (2006)

In terms of air emissions, it is suggested that all power generation systems cause some emissions and wastes because of the impacts of plant construction, manufacturing of components and transport of materials. However, in terms of plant operation, hydro – large and small, wind and solar, none have been found to cause harmful emissions. Further, it is expected that new plants will consistently outperform the environmental impacts of older plants in addition to creating efficiencies.

The management of electricity generation for any region must include an assessment of cost of supply. Long term pricing trends for fossil fuels are expected to increase but long-term trends for nuclear and renewable energy sources are expected to decline as technologies improve. The Guide to Power Generation in Canada (2006) compared the cost of new installation generation for technologies available in Canada and found that hydro power and small hydro projects are among the cheapest options (Figure 2) – the values in this table include capital investment, fuel, operation and maintenance costs etc. Current average wholesale prices of electricity in Canada range from $0.05 to $0.10 per kWh, though during peak demand periods wholesale prices are much higher. The added benefit of potential trading of emissions credits can, in the future, further narrow the gap between costs for renewable and traditional energy technologies. All of these are positive attributes for run-of-river projects.

Note we do expect that pricing of supply is project dependent and related to the costs of transportation and construction. As such costs can increase significantly every year, pushing the price of supply upwards. As time passes, the wholesale generation cost ranges in the table below shift slightly to the right for most technologies. In addition, it is likely that the wholesale prices for electricity will also increase.

Figure 2: Comparison of New Installation Generation Costs




Source: A Guide to Power Generation in Canada (2006)

## *Small vs. Large Projects*

The debate over the superior benefits and negative impacts of small versus large hydroelectric projects has been ongoing for sometime. Interest groups, environmentalists and hydro developers have not been able to agree on what size of project is superior overall i.e. environmentally or in terms of efficiency. Mostly the answer comes down to the characteristics of the project site itself, as the site conditions and characteristics determine what size will be optimal with the least amount of environmental disturbance. The Canadian Centre for Energy Information has presented what it believes to be the advantages and disadvantages of each size of project, shown in Table 4.

Table 4: Small vs. Large Hydro Projects

| | Small run-of-river | Large run-of-river | Large hydro with reservoir |
|---|---|---|---|
| **Advantages** | | | |
| | faster to construct | avoids flooding | reliable generation that follows demand patterns |
| | avoids flooding of nearby land | least cost option | provides flood control |
| | can be built close to communities | can benefit from existence of upstream reservoir | reservoir can be used for recreation |
| | can benefit from existence of upstream reservoir | | cost-effective |
| | | | can be used as back up/intermittent supply |
| **Disadvantages** | | | |
| | higher cost of electricity supply | long timelines for regulatory approvals | causes flooding of land |
| | generation does not follow demand patterns | long construction timelines | causes changes in river flow |
| | cumulative impacts of many projects are unknown | | long timelines for regulatory approvals |
| | | | long construction timelines |

Source: Canadian Centre for Energy Information 2007

## *A Closer Look at Small Hydro Projects*

There are many opportunities for small hydro development across Canada and the U.S., with several projects already operational and several more in the planning and development stages. About two-thirds of electricity in Canada (67GW) is provided by hydropower, though only about 3% of it is from small projects (2GW). When we refer to small hydro power, we typically mean a maximum capacity of about 50MW where one megawatt is sufficient to power about 500 residential properties, though the definition of 'small' is not universal. It also typically refers to run-of-river hydro projects, though there are run-of-river projects with capacity greater than 50MW.

Table 5: Hydro Power Generation Project Sizes

| Project Size | Generating Capacity | Supply Capability |
|---|---|---|
| Pico | < 5kW | small amounts of electricity (1 or 2 lightbulbs) |
| Micro | < 100kW | 1-2 residential homes |
| Mini | 100 - 1,000 kW | small factory or isolated community |
| Small | 1 to 50 MW | 500 to 25,000 residential properties |

Source: B.C Hydro

Small hydropower is often used to supply power in more remote locations that are not connected directly to the regional power grid. There are approximately 5,500 sites in Canada that have been identified as small hydro sites, with the potential to generate 11GW of electric power annually. However, only about 15% of this total is currently believed to be economically feasible, with the remaining portion likely to require significant infrastructure development that makes the project costs prohibitive.

## *How does a run-of-river development work?*

In a run-of-river project the consistent and steady flow of water and elevation of a river are used to generate electricity. The difference between run-of-river and traditional hydro power generation is that run-of-river projects do not require the impoundment of a large reservoir of water and the projects tend to be smaller in scale. By definition, a run-of-river plant may store no more than a 24 hour supply of water. There is a low elevation intake weir that usually spans the full width of the river which is in place to ensure that the penstock (delivery pipe) has a continuous supply of water. The water flowing down a river is redirected towards the penstock, which feeds the water downhill to the power station. The natural force of gravity creates the energy used to spin the turbines located in the power station which converts the energy from the water to generate electricity. Downstream from the turbines the water is then directed back to the existing flow of the river.

The capital costs for each run-of-river project are significant and are allocated to the following:

- **Intake weir** –constructed to draw water from the river and a small pond of water or headpond is created. Run-of-river projects can be classified as low head (heads under 60 feet) or high head (heads over 60 feet), where the head is defined as the difference in the elevation of water at the penstock and the elevation of the turbine inlet located in the powerhouse.

- **Penstocks** – These are the pipes that deliver water from the head pond to the turbines in the power station at a lower elevation.

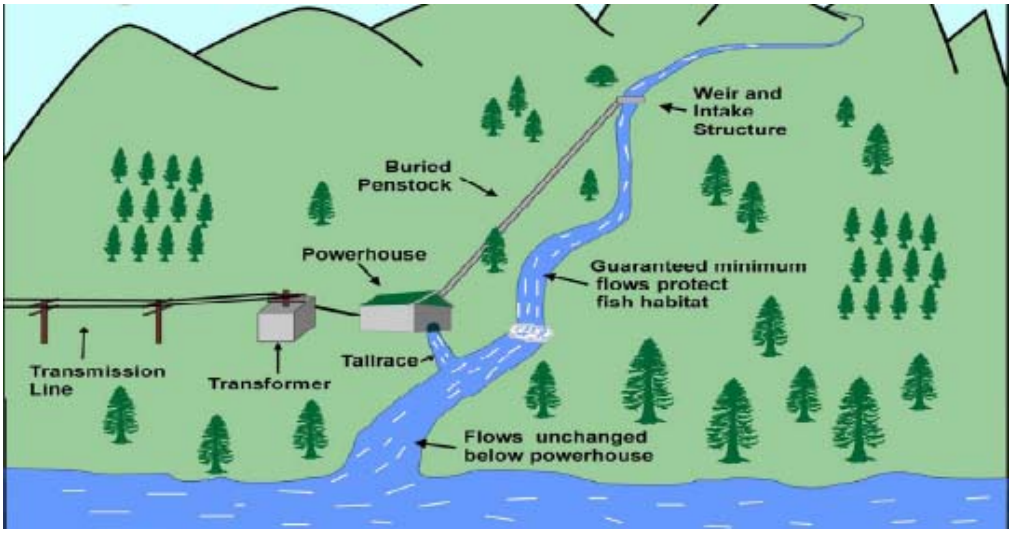
- **Powerhouse containing the turbines** – The turbine lies at the core of a hydroelectric facility. There are three categories of hydro turbines, radial flow, axial flow and impulse. The head, flow and volume of water at the site determine which type is best to use. The best type of turbine design for low head dams is a propeller turbine, which is a type of axial flow turbine (power is created from the pressure and weight of water). Inside a propeller turbine there is a propeller (with three to six blades) inside a tube that is connected to a generator by a shaft. The water flows through the tube, constantly contacting the blades, which serves to turn the propeller and then turns the generator to produce electricity. With increasing research and development into the engineering and design of turbines associated with run-of-river power generation, it can be expected that improvements would reduce overall maintenance, installation and replacement costs to a project. The speed of the generator must be compatible with that of the turbines selected.

- **Tailrace** – Located where the water is discharged from the powerhouse back into the natural flow of the river.

- **Access roads** may be required to establish a site depending on existing infrastructure and remoteness of the project site. The permitting process, land clearing and the engineering and development of access roads can have significant impact on the cost of developing a site.

- **Transmission lines and interconnections** from the powerhouse to the local transmission grid can have a significant impact on projects costs. Again, as with access roads, a remote site may require significant investment in transmission infrastructure to connect the project to the local grid.

Figure 3: Run-of-river Hydro Power Generation Plants




Source: Run of River Power Corp (ROR-V)

### *What makes a good run-of-river project site?*

The characteristics of a good run-of-river site include:

- The presence of a sufficient volume of running water. However, in-stream flow requirements vary significantly and are specific to the site and the time of year.
- The size of the head generally dictates efficiencies of a project once it is operational. Estimations of output (capacity) are calculated by the following formula: net head (m) multiplied by the flow ($m^3/s$) multiplied by a conversion factor. Capacity factor is the ratio of the actual energy produced in a given period, to the hypothetical maximum possible, i.e. running full time at rated power.
- A site with low potential environmental impacts that do not interrupt the natural habitat.

## Industry drivers and critical advantages

- **Low environmental impacts**: Run-of-river hydro is considered to be green energy with little to no environmental impact associated with a run-of-river hydro development – there is no damming as required by large hydroelectric projects (therefore no flooding or habitat displacement); there are no air emissions; it is carbon free and is a renewable, non-depleting resource. It also has the potential to displace high greenhouse gas (GHG) emitting sources such as coal.
- **Efficient operating capacity**: The operating life of a project is typically greater than 50 years and is inexpensive to operate throughout its life (operating costs can be expected to run at less than 20% of revenue).
- **Fixed long-term contracts**: Long term EPA contracts allow for reduced exposure to energy price volatility and little to no fuel commodity risks.
- **Reliable supply**: It is a reliable and efficient source of energy; available as needed; it only takes a small amount of flow (2G/min) or a small drop (as little as 2ft) to generate electricity.

- **The generated power is transportable** and can be integrated with the local power grid relatively easily.
- **Incentives**: There are government incentives in place to drive infrastructure investment, but the industry is not as dependent on these incentives relative to other sub-sectors.

## Disadvantages

- **Social impacts**: Project development can have social costs, impacting hunters, fishermen, hikers and conservation efforts. Run-of-river projects may face opposition from local communities such as local First Nations' that might have claim to the land, water or surrounding area through which transmission lines, penstock or access roads must be built. Land use agreements and negotiations can lengthen the time required to develop a project or hinder its ability to secure necessary permitting and financing.
- **Environmental impacts**: Fish habitat is a significant concern with run-of-river projects. Reduced water flows can change the quality (water velocity, temperature, depth, vegetation) of the habitat for fish and other organisms. Project factors to consider are the pre and post water diversion flows, the fish species present and the operating plans for a project. Negative impacts to resident fish populations can give cause to an economically feasible project not being developed at all (such as Plutonic Power's 14MW Rainy River project). Note though that there is a high degree of uncertainty on what the appropriate levels of in-stream flows should be for fish. As a result in-stream flows are established on a project by project basis.
- **Infrastructure impacts**: The infrastructure around the project, the roads, transmission lines etc. cause damage to the habitat, introduce invasive species and increase human traffic, interfering with wildlife and plant populations and general conservation efforts.
- **Supply subject to changes in seasonal water flows**: Fluctuations in precipitation and seasonal runoff (spring thaw and glacial melt) can impact the flow and capacity utilization of a site and thereby the reliability of the electricity generated and ultimately revenues and expected returns.
- **Supply subject to changes in weather patterns**: Turbulent water that does not freeze can be slushy and pipeline freezing can be an issue, increasing downtime and again impacting the reliability of the electricity generated and capacity utilization (revenue generated) of the project.
- Projects may compete for alternative uses of land; rivers that were once open for public use would become private property with limited access.
- Site expansion is often not possible depending on the size of the river.
- **Costs**: High upfront capital investments can be subject to interest rate fluctuations if debt financed, with potential long-term negative impacts to the cost structure and profitability of a project
- **Complicated approval process**
- **The potential cumulative impacts when combined with other power projects or uses are still relatively unknown.** There must be consideration of joint impacts of multiple power projects within a region, however it seems there is no established protocol for addressing the potential negative impacts or even in evaluating what the true impacts may be. There is evidence of a lack of regional planning for numbers and locations of run-of-river projects.

## *Capital Costs for Run-of-river Projects*

The cost to produce each megawatt of power from a run-of-river project varies depending on the project because of differences in terrain, capacity, hydrology and location. According to the Ministry of Natural Resources, approximately 75% of the start-up costs are site specific. As such, it is likely that the more economic projects (lower cost per MW) in BC will be developed first, and certainly clusters of projects where infrastructure (roads, transmission lines etc) is already in place, or can be utilized by multiple project sites will be the first to be developed (assuming all else the same). Once a project site is operational the equipment is viable for 50 years or more before replacement is necessary (indefinitely if refurbished) and the operating costs over that period are very low. One part-time operator is usually sufficient to oversee any one project and periodic maintenance of the equipment is required. Details of the capital cost allocations for a typical run-of-river site shown in table 6. The engineering work is a large part of the development process with surveys and hydrology studies required, pre-feasibility studies, feasibility studies and then system planning and engineering. The cost for a transmission line depends on the distance – a 25kV line up to 50km in length costs ~$70,000/km; a 69kV line 50-100km in length costs ~$140,000/km; and a 138kV line greater than 100km in length costs ~$220,000/km. The total development time can take from 2 to 5 years for any one project.

Table 6: Run-of-river Project Cost Details

| | |
|---|---|
| | Penstock cost |
| + | Intake cost |
| + | Powerhouse cost |
| | **Subtotal 1** |
| | |
| | **Site factor X Subtotal 1** |
| | |
| | Generating equipment cost |
| + | Access road cost |
| + | Switchyard cost |
| | **Subtotal 2** |
| | |
| | Engineering (20% of subtotal 2) |
| + | Contingency (30% of subtotal 2) |
| | **Capital cost** |
| | |
| + | Transmission line cost |
| | |
| | **TOTAL CAPITAL COST** |

Source: B.C Hydro

After roughly a $2-3M/MW capital cost, give or take a little based on site specifics, operating costs typically run at up to 20% of revenue for run-of-river projects. This includes water rental rates, property/school taxes, First Nations benefits, and federal/provincial taxes etc. As such, about 50-60% of the operating costs for these projects are paid back to the government once they are constructed and running.

# FOCUSING ON BC

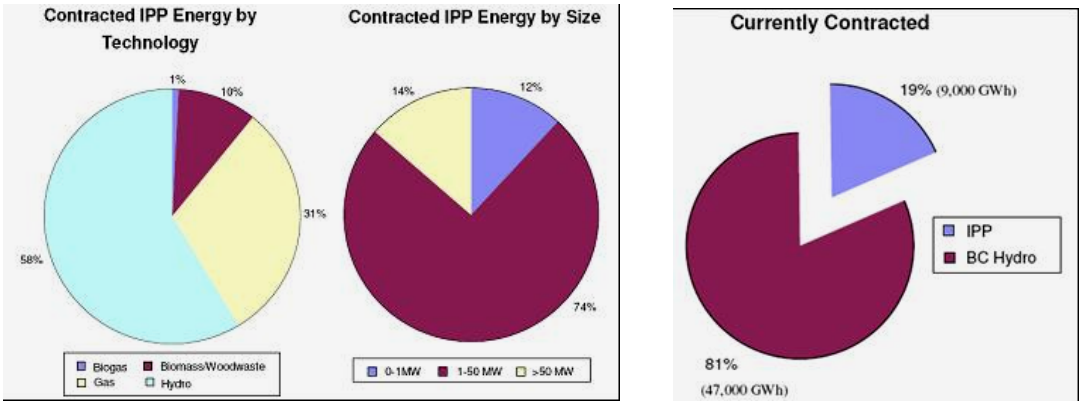
## *The BC Government's Energy Plan*

A key driver in the development of alternative energy projects in BC is the BC government's 2007 BC Energy Plan which was revised January 2007. The plan outlines the government's strategy to drive the province towards energy self-sufficiency by 2016 and reduce greenhouse gases in the province by way of energy conservation and the use of alternative, cleaner energy sources. Ultimately, under the plan BC would becomes a net exporter of clean, alternative energy. Key policy actions and objectives set or updated in the 2007 Plan include:

- All new electricity generation projects in the province must have zero net greenhouse gas emissions, with existing thermal generation power plants meeting the same target by 2016.
- There will be no nuclear power in the province and the aim is to ensure at least 90% of BC's electricity be generated from clean or renewable energy sources (up from a 50% target in the 2002 Energy Plan).
- Conservation targets that would see 50% of BC Hydro's incremental resource needs be met through conservation and energy efficiencies by 2020.
- The province must maintain competitively priced power and electricity rates.
- The province must achieve energy self-sufficiency by 2016.

When considering the zero emission and low pricing targets of the BC Energy Plan, geothermal, wind, bioenergy, solar and run-of-river project developers/operators would appear to be well positioned as zero emission, lower cost alternatives. Large hydroelectric projects can produce low cost and more reliable energy than the aforementioned alternatives, but such projects are also known to have a greater negative environmental impacts (damming, flooding and habitat displacement) as well as longer project construction and lead times – these factors are contrary to the goals and timeline of the Energy Plan and are perhaps better suited to complement longer term goals beyond 2016. Run-of-river projects are an inexpensive and relatively simple way to supplement future energy generation. It would seem that the province of BC is also trying to incentivise smaller developers with the Standing Offer Program for <10MW projects, that might otherwise be left out of the larger Calls for Power. The Call for larger projects can contain restrictions that may otherwise prevent the success of small projects in terms of the economic feasibility.

Figure 4: BC Hydro's Contracted Energy Supply Mix




Source: (http://bioenergyconference.org/docs/speakers/2006/McDonald_BioEn06.pdf)

The contracted energy supply mix depicted above (2006) illustrates how underutilized alternative IPP generated energies are as a percent of the total energy supply mix in BC. As new sources of energy supply come into the mix to meet energy demand, new clean alternatives must be permitted even to maintain the current percentage profile; further underscoring the development potential of clean, alternative energies in the province.

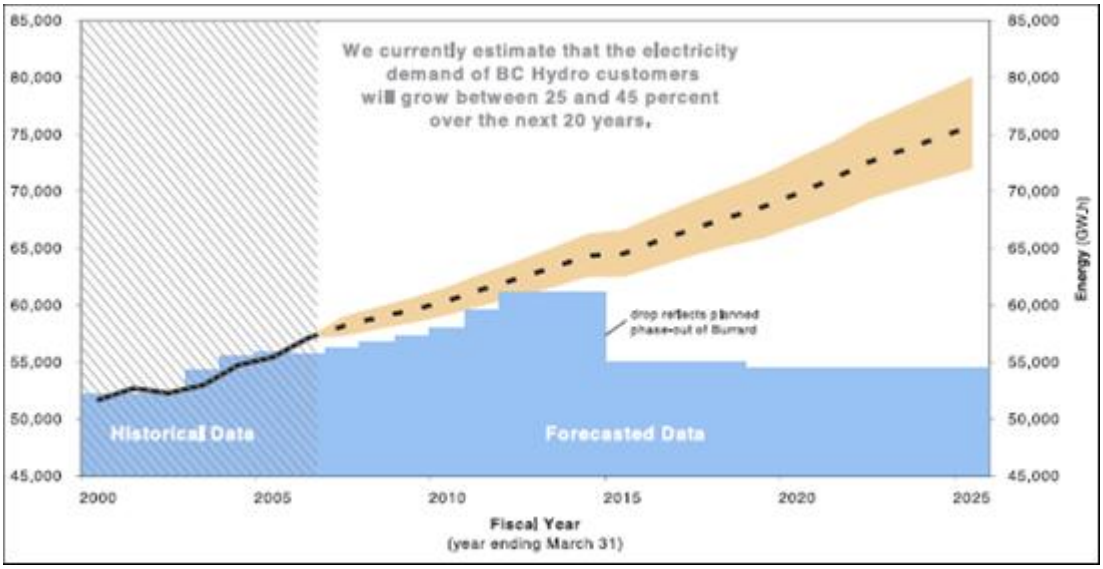
BC Hydro has mandated that another 10,000 GWh be derived from independent power producer projects (IPPs) by 2015. Roughly 19% of the province's currently contracted energy supply is from IPPs and about 81% from BC Hydro.

## The BC Market

BC Hydro forecasts energy demand in BC to grow by 25% to 45% over the next twenty years. This growth is driven by increases in regional population size, the rise in new housing starts, demand for natural resources, the increase in electricity demanded by electronic goods/home electronics, and economic growth. The population of BC is expected to increase 22.5% from 2007 to 2025, tracking at an average annual growth rate of 1.13% or CAGR of 1.4%, reaching 5.3M by 2025.To help meet this demand growth, BC Hydro has chosen to rely on IPPs in mitigating the projected supply side energy deficit in addition to conservation objectives (demand-side management). As a result, we expect growth in IPP supply of electricity in the province to increase above current levels. The Clean Power Call is part of the province's Energy Plan to proactively procure new sources of energy supply for future consumption. In accordance with the goals of clean energy and self-sufficiency, and when considering the longer lead times required before a larger hydro project is operational, IPPs with economically viable projects that can be cost effectively brought into production in the near to medium term stand to benefit in the Clean Power Call the most.

According to BC Hydro, contracted clean electricity sources can be expected to meet 41% of the incremental demand in the province over the next 10 year target period. Thus there is an obvious need to contract more electricity sources to meet the demand gap over this time period alone. The question remains whether energy conservation and supply management will still be able to meet the needs of BC electricity customers without having to pay extremely high prices. With consistent increases in electricity demand over the last few years and the shortfall in electricity supply, import of electricity has also been increasing and roughly 10% of the load demand in 2004 was imported (5,500GWh), about 13% was imported in 2005 (7,000GWh). Notably, much of the imported electricity from Alberta and the US has historically been derived from fossil fuels (gas and coal).

Figure 5: BC Hydro's Projected Electricity Gap




Fiscal Year (year ending March 31

Source: BC Hydro Challenges and Choices, Haywood Securities

## Independent Power Producers in BC

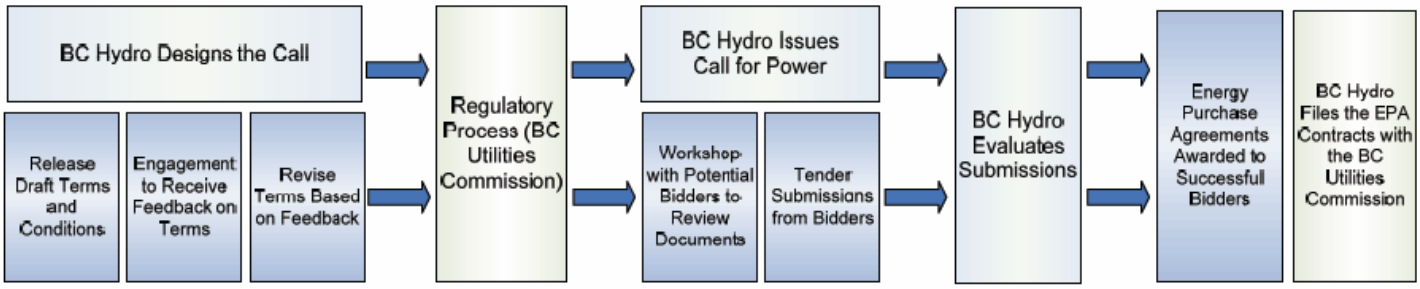
There are 43 IPPs currently operating in BC, generating about 5,000GWh of electricity or supply for approximately 500,000 homes in the province. This represents just about 10% of the total system capacity for BC. IPPs currently generate about 1,550GWh of green energy annually which is an offset of about 450,000 tonnes per year of carbon dioxide emissions. BC Hydro has contracted for an additional 14,000GWh of supply, or an additional 9% of load.

A study conducted by BC Hydro in 2002 suggested that the province's small hydro capacity was about 2,500 MW. This was followed in 2005 where BC Hydro determined that nearly 900 small hydro sites had the potential for successful development across the province. A majority of the IPP projects that have been granted electricity agreements by BC Hydro are run-of-river projects. About 25 run-of-river projects were built prior to 2006 and an additional 41 have received approval from BC Hydro for development since then. Since 1990, IPPs have filed Water License applications for approximately 400 creeks, however only 34 plants have actually been built so far.

### *BC Hydro Open Calls for Power*

In an effort to make BC energy self-sufficient by 2016, and to producing 90% of its incremental energy from clean sources of supply, BC is focusing on the private generation of power. As such, BC Hydro has been conducting Calls for Power for several years in an effort to keep up with the annual changes to the province's mandated Energy Plans. BC Hydro's typical Call design process is shown in Figure 6 below.

Figure 6: BC Hydro Call Design Process




Source: BC Hydro Challenges and Choices, Haywood Securities

A Call for Power was held in 2002/03 and 16 contracts were awarded (see Appendix B). To date, only four have produced power for the province. One of the limitations of the 2003 Call was the maximum electricity price of $55/MWh (increasing at 0.5*CPI annually) set by BC Hydro. This price, particularly at that time, has been proven to be too low for many developers to build and operate projects, particularly as construction rates have increased. In the 2006 Call for Power, 38 contracts were awarded for over 7,000GWh of capacity or enough power to meet the needs of over 700,000 homes. Approximatley 29 hydro, 3 wind, 2 biomass, 2 waste/heat and 2 coal/biomass projects were granted EPAs (see Appendix A). The average term of the long-term purchase agreements was 30 years and the projects ranged in size from 1MW to 200MW capacities. The average levelized bid price of the large projects was about $74/MWh and that for the small projects was about $70/MWh, with 73% of the energy classified as clean energy.

## BC Hydro Clean Power Call

BC Hydro Calls for Power generate significant interest in the province. The Call for Power in 2006 resulted in the award of contracts with production potential of 7,125GWh per year supplied by about 38 projects. Another 10,000 GWh per year is expected to be contracted for in 2007/08 and 2009 for supply by 2015 (approximately 5,000 GWh per year in each call at a minimum). Following the finalization of terms for the Clean Power Call expected in early 2008, the bidding process is expected to close in the summer of 2008, with contract award announcements to occur in the fall of 2008.

The drivers for Clean Power Call include the following;

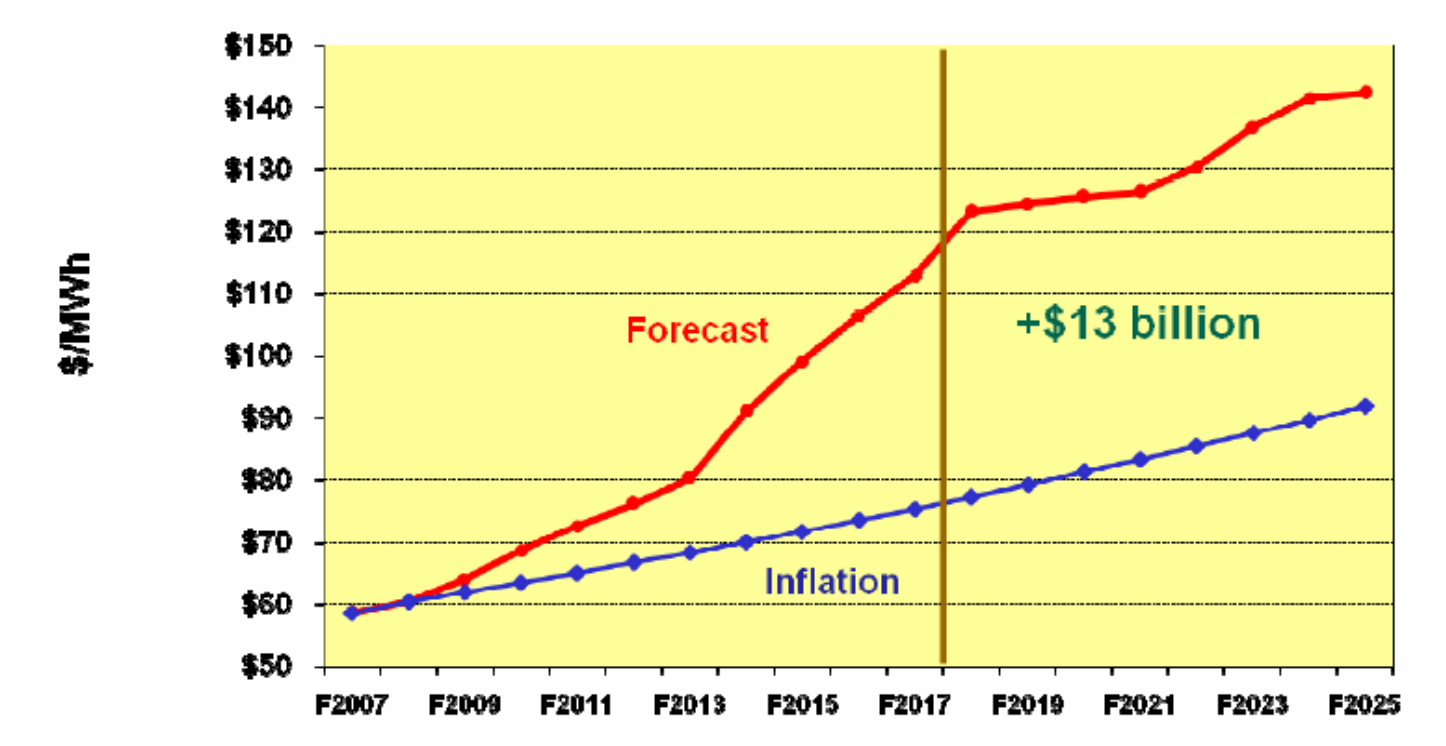
- A shortfall in supply of power – BC Hydro continues to face a power shortfall over the next several years with the anticipation that current supply will fill only 41% of demand in the future.
- BC Energy Plan requires the province to be completely energy self-sufficient by 2016, with new energy generation to have zero net greenhouse gas emissions (90% of new energy must be derived from clean technologies); investment in nuclear power is banned by the province.
- Rising construction and labour costs are likely to continue driving bid prices in future Calls for Power upwards.
- Project attrition and failure rates have been rising with each subsequent Call for Power.

As a result, we expect BC Hydro to contract for more power than the 5,000GWh minimum stated volume, suggesting that most reasonable applications submitted in this next Call for Power are likely to be awarded an EPA. This is likely to drive pricing to significantly higher levels than

previous Calls for Power for which contracts were awarded at prices as high as $95/MWh. In this Clean Power Call we expect pricing to surpass the $100/MWh mark, perhaps reaching as high as $125/MWh. This is particularly the case given that in the draft terms for the Clean Power Call that were recently released, the value for green attributes is to be included in bid prices. What that value is right now, is currently up for debate as there is no real open market trading system in Canada for green attributes. Note that in the 2006 Call for Power in BC, green attributes were given a value of about $3/MWh.

With higher contracted pricing levels, it is more likely that both wind and run-of-river hydro projects with high capital costs can be economically successful once fully operational. However, the more difficult projects in remote regions and in rougher terrains may still be subject to high attrition rates. As a result of the increasing prices of acquired power in BC, the average electricity price forecast per the Joint Industry Electricity Steering Committee predicts annual pricing growth of up to 16% over the next decade.

Figure 7: Average Electricity Price Forecasts (JIESC)




Source: Joint Industry Electicity Steering Committee – The New Electric Power Environment in BC, IPPBC Conference 2007

The draft terms for the Clean Power Call were recently issued by BC Hydro and are currently open for public and interested party comment until December 14, 2007, An information session to discuss the design of the Clean Power Call is set for November 27, 2007. BC Hydro is expecting to build on the success of the 2006 Call for Power and so plans to implement the Clean Power Call in a similar way. However, there were a few key differences issued in the draft terms for the Clean Power Call versus the 2006 Call for Power.

- **Environmental attributes must accrue to BC Hydro** – in the previous Call for Power, the bidder for EPAs had the option to retain the green credit or trade them for a bid price credit in the process where contract pricing was determined by BC Hydro. In the Clean Power Call, BC Hydro is mandating that the green credit be handed over to it, with the benefit of the green credits included in the bid price. This is likely to be a significant point of contention as many IPPs viewed these green credits as a source of significant upside in the future and many were considering retaining them in the Clean Power Call. Further, as we previously noted, there is much debate over what the current value of the green credits are.

- **Firm Energy commitments are over a season rather than a month** – The timespan over which a bidder commits to providing a certain amount of energy is extended to a season, from a month. This is positive for intermittent renewable generators and will likely result in a greater amount of energy supply being designated as firm in the Clean Power Call

- **Option to BC Hydro for residual rights to projects** – BC Hydro is looking at including an option to purchase projects once the EPA is completed, such that security in power supply is more stable over the long term and guaranteed. Opposition to the use of independent suppliers for power is the lack of security in supply at the end of EPA contracts. The purchase option may be under consideration in order to address that issue. However, this may also be contentious as the value of a project is also derived from the post EPA period where electricity may be supplied to other users (US/Alberta etc) at the then current market prices.

- **A wind integration adjustment** – In order to account for the costs of wind integration BC Hydro is considering a penalty to wind projects in the bid levelization process which could be as high as $5-15/MWh.

- **Freshet supply limitation and price levelization** – BC Hydro intends to limit the purchase of power during the freshet period (May to July) to 20-25% of its total annual energy supply – this was set at one-third in the 2006 Call. Also, there are adjustments to the levelized bid price for delivery time of firm energy as there were in 2006 Call for Power. Table XX details those adjustment factors. Non-firm energy can be elected by the seller to be paid as a fixed dollar amount of between $50-80/MWh (growing at CPI less line losses, adjusted for delivery time) or an average of mid-C pricing (Mid-Columbia hub is a source of price discovery for power traders in the Northwest US – it is the average peak day price for the electricity hub along the mid-Columbia River) less adjustments.

Table 7: Delivery Time Adjustment Table

| Time of Delivery | Adjustment to Base Price | |
|---|---|---|
| | High Load Hour (HLH) | Low Load Hour (LLH) |
| January | 125% | 106% |
| February | 126% | 110% |
| March | 114% | 106% |
| April | 103% | 95% |
| May | 92% | 76% |
| June | 90% | 72% |
| July | 91% | 72% |
| August | 95% | 81% |
| September | 96% | 88% |
| October | 108% | 97% |
| November | 109% | 102% |
| December | 122% | 102% |

Source: BC Hydro Clean Power Call – EPA Term Sheet

- **Wood biomass projects must submit to the Bioenergy Call** – All projects with plans to provide power through the biorefining of wood products must enter the Bioenergy Call. There was no Bioenergy Call in F2006 and so projects such as these did participate in the regular f2006 Call for Power.

A guarantee for commercial operation date (COD) is set for between November 1, 2010 and Novermber 1, 2016 for a term of 15 to 40 years as set out in the EPA application. We expect BC Hydro will prefer longer-term projects as the economics over a longer period can be more favourable.

BC Hydro is currently in the process of designing the Bioenergy Call to ensure the bid process remains competitive and has also presented revised draft terms for the Standing Offer Program for <10MW projects.

## Standing Offer Program (SOP)

With concern over the administrative burden for small projects entering the Clean Power Call, BC Hydro was directed under the province's BC Energy Plan to develop a program to purchase electricity from projects with capacity of 10MW or less. The design of the SOP is well under way with the set of revised draft terms recently released by BC Hydro. There is an information session To be held November 29, 2007 to discuss the revisions, following which BC Hydro expects to file for proceeding with the Program with the BCUC in December 2007. The launch of the Program to begin receiving bids is expected in the spring of 2008 and contract awards are expected before year end.

As per the province, there is no initial quota set for the SOP regarding how much or how little non-firm energy BC Hydro will buy in the under 10MW range. Some of the more pertinent terms as outlinged in the SOP draft Program Rules are as follows.

- Energy generated from the project must be clean, renewable or high efficiency co-generation;
- Projects must be located in BC
- Projects for which an EPA was granted and signed in 2006 or later are not eligible to apply to the SOP regardless of termination or expiry of the EPA;
- The price of energy under a SOP project EPA will be a fixed price determined by the region where interconnection or delivery to the transmission lines occur. The base price will be escalated at CPI from 2008 until a project EPA is signed; once signed 50% of the escalated base price is escalated by CPI annually, starting at January 1 each year.

Table 8: Base Price Per Region

| Region of interconnection/delivery | Base price (2007$/MWh) |
|---|---|
| Vancouver Island | 79.00 |
| Lower Mainland | 78.00 |
| Kelly/Nicola | 75.00 |
| Central Interior | 72.00 |
| Peace Region | 65.00 |
| North Coast | 66.00 |
| South Interior | 67.00 |
| East Kootenay | 71.00 |

Source: BC Hydro Standing Offer Program – Standard Form EPA

- The escalated base price is then adjusted based on the time of delivery

Table 9: Delivery Time Adjustment Table

| Time of Delivery | Adjustment to Base Price | |
|---|---|---|
| | High Load Hour (HLH) | Low Load Hour (LLH) |
| January | 125% | 106% |
| February | 126% | 110% |
| March | 114% | 106% |
| April | 103% | 95% |
| May | 92% | 76% |
| June | 90% | 72% |
| July | 91% | 72% |
| August | 95% | 81% |
| September | 96% | 88% |
| October | 108% | 97% |
| November | 109% | 102% |
| December | 122% | 102% |

Source: BC Hydro Standing Offer Program – Standard Form EPA

- The supply of power should be designated non-firm energy under the contract terms;
- BC Hydro is expected to absorb tranmission/distribution net work upgrade costs subject to a cap on a per project basis;
- BC Hydro will retain all environmental or green attributes associated with the projects, including credits associated with greenhouse gas emissions; BC Hydro will adjust the base payment by $3.05/MWh (adjusted by CPI annually) for each MWh of energy that has environmental certification
- The developer can select an EPA term of 20 to 40 years from the date of delivery (COD)

While the program has been designed to accommodate smaller projects, we expect there may still be a pricing issue for some of the developers, as the base prices in the $60-80 range are significantly lower than that likely to be bid in the Clean Power Call., even after the green attribute credit has been added.

## Alternative Sources of Supply for BC Hydro

The government may be considering some alternative sources for large scale supply of electricity, in addition to the independent/private projects it is supporting with EPAs. As such, there has been discussion about the consideration of a 'giant' hydro project, a third dam on the Peace River, by BC Hydro. Such a large scale proejct could serve to increase the hydroelectric capacity in BC by about 8% and take the province a lot closer to becoming securely energy self sufficient by 2016.

There are already two large hydro projects on the Peace River. The consideration of adding a third large project is not new this year; it is just circling back to the forefront as BC Hydro assesses its current position relative to where the province wants to be in ten years. Larg scale projects could certainly help meet the supply/demand gap, as well as the province's plans to become a net energy importer by 2016. However, there has been strong public opposition to the development of a third project along the Peace River. The flooding requirements and negative long term environmental impacts of another large dam on the river could be significant. In addition, the costs for building this project could be as high as $5 billion, well above that of independent power producers costs for supply.

### *From Design Plans to the Electricity Grid*

There are essentially two approval processes for independent power projects in BC, one governed by BC Hydro which carries a power contract with it, and the permitting process governed by various government agencies. We note that there is not one consistent process for BC Hydro and the various government agencies to work together in determining whether or not a project approval should be granted, and as a result this can be a rather cumbersome process. There is also a third level of approval for some projects, where First Nations must be consulted and in some cases appropriately compensated for any inconveniences or adverse impacts resulting from the development of a particular project. BC Hydro also uses an independent body to certify projects where a developer has applied for green power status once construction is complete.

## BC Hydro Approval and EPAs

As we have discussed earlier in this report BC Hydro conducts open calls for power in a competitive bid process to determine which companies will be granted contracts to supply power to the grid for a fifteen to forty year period (as in the F2006 Call for Power and likely the Clean Power Call). These contracts, electricity purchase agreements or EPAs, place very stringent deadlines for gaining approvals from the various regulatory bodies and for beginning construction.

BC Hydro has issued private calls for power in 1989, 2001-2003, 2006, and now during 2008. It is expected that there will be one more call for power in 2009. A call for power is an open offer to private companies to submit a proposal for the development of an energy facility that meets very specific guidelines. BC Hydro conducts a review of the submissions and issues EPAs to the optimum projects. Following the issuance of an EPA, the company must obtain all regulatory approvals and begin construction within a two year period for the contract to remain valid.

The types of energy projects that are granted EPAs depend entirely on the submissions in the open call for power. The province does not mandate what types of energy supply will be selected or in what proportion they may be selected prior to the open call except that coal generation is not permitted and nuclear power is banned in BC. BC Hydro does have some screening criteria when considering the issuance of an EPA. These include:

- The experience of the developer in developing and operating power projects
- The developer's financial capacity and credit worthiness

- The proposed development schedule - the ability to develop the site within the proposed schedule
- Site control and services
- Fuel supply
- Community and First Nations consultation – the developer must have issued a public notification about the project development and provided sufficient information to the community and First Nations
- The ability to attain permits – approval is not necessary prior to attaining an EPA but applications for required permits must have been submitted

## The Permitting Process

Crown land in the province of BC comprises about 94% of the total available land within the borders of the province, including all water present with the boundary (including streams, rivers and lakes etc). As such all power projects require the approval under the Land Act in the province, as well as approval under the Water Act if these projects intend to use the bodies of water in the region. For projects located on private property, arrangements for use must be negotiated with the private land owner. The approval process for access and use of Crown property is governed by the Ministry of Energy, Mines and Petroleum Resources and the Ministry of Agriculture and Lands (The Integrated Land Management Bureaus was established to review wind and waterpower projects for Crown land). Access to Crown lands is coordinated by the FrontCounterBC: Natural Resource Opportunity Centres. Water licensing in the province is governed by the Ministry of Environment which governs the Water Act and the Environmental Assessment Office.

So far, there has rarely been a problem in gaining regulatory approval where BC Hydro has granted an EPA contract. Steps to attaining permits for the development of a water power project in BC include the following:

1. Application – FrontCounterBC accepts and processes all applications for the review of a water power project to begin. Incomplete applications are returned with deficiencies highlighted for re-submission. FrontCounterBC is also responsible for the notification of other potentially interested parties such as First Nations to begin the assessment of aboriginal rights as per the Provincial Policy for Consultation with First Nations.
2. Application review – A complete application is then delivered to the ILMB for the Crown land application review and to the MOE for the water licence application review. Depending on the complexity of the project a project review team may be assigned to oversee the review process.
3. Development plan – a full description of the project identifying the impacts of construction and operation is created and the impacted parties are identified for consultation. The identified parties are provided with a copy of the licence applications with a feedback form and all discussions with these parties and regulatory bodies are documented.
4. Development plan review – The ILMB undertakes a complete review of the development to ensure that all necessary information is available for further assessment of the project.
5. Project review – All identified parties of interest have an opportunity to comment on the proposed project at this stage. A focus of this review is to determine the potential for infringement of aboriginal rights or title to land or water resources.

6. Summary report preparation – Feedback collected through the previous steps of this process are outlined in a report which draws conclusions as to the impact assessment of the project and the proposals for mitigation/compensation to affected parties and whether or not agreements were negotiated with these parties.
7. Application decision – All available information is assessed by the ILMB and the MOE in determining whether or not a licence is granted. The regulatory bodies may impose certain obligations for the construction or operation of the project which must be adhered to under the licence. Access to the use of Crown land can be granted in a few forms – Investigative permit: short term tenure to facilitate inspections/surveys/investigations etc (2yr renewable permit) that does not allow for building construction; Licence of occupation: non exclusive use of the land allowed varying from 3yrs to an indefinite term (should be made within 6mths of the issue of an investigative permit); Works permit: required for the construction of buildings/roads/bridges over Crown land for a maximum term of 2yrs with non-exclusive rights; Crown lease – allowed during the later stages of a project where an exclusive lease is granted for use of an area of land.
8. Construction – plans for construction must be submitted to the regulators prior to beginning construction to ensure compliance with all terms of the licenses.
9. Project operation – The licensee must obtain written approval to begin operations of the project once construction is complete.
10. Project monitoring – A monitoring program is required to gather data on the project impacts which may include environmental impacts as dictated by the license.

Once all the licenses have been granted and accepted, there are rents imposed dependent on the location of the land and type of use intended. For hydro projects, the annual water rental fees depend on the use of the power, the capacity and the output of the plant. General use projects have an annual fee of $3.676/kW of installed capacity and $1.103 for each MWh of electricity produced. There is a water tax on energy produced over and above 160GWh/year at $5.147/MWh of electricity produced.

Projects with capacity over 50MW are defined as reviewable projects under the Environmental Assessment Act by the Environmental Assessment Office (EAO), although some smaller projects can also be deemed reviewable if there is potential for significant adverse impacts (environmental, social, health etc). An Environmental Assessment Certificate (EAC), granted for 3 to 5 years and renewable for up to 5 years, is an eight step process. If a project is deemed reviewable by the EAO, no project construction may begin until an EAC is issued. We note that most run-of-river project fall under the 50MW threshold and so avoid this process which at times can be viewed as quite stringent.

1. Project is deemed reviewable
2. Determine how the project is to be reviewed
3. Determine how the assessment will be done – an assessment of the scope of the project, methods of environmental assessment, potential impacts, consultation with First Nations and the public, time limits for assessment.
4. The terms of reference for approval of the application are determined
5. An application for the EAC is prepared based on the previous step
6. The application is reviewed
7. The EAO prepares an assessment report
8. A decision to issue an EAC is made within 45 days of receiving the assessment report

Additional requirements under current legislation are governed by the Water Protection Act, the Fish Protection Act, the Fisheries Act, the Canadian Environmental Assessment Act, the Navigable Waters Protection Act, the BC Fisheries Act, the BC Wildlife Act and the BC Environmental Management Act, for example. Not all require the application for a permit or license, but there may be requirements to inform the authority as part of the consultation process.

## The Interconnection Process

The BC Transmission Corporation (BCTC) was formed in 2003 to oversee BC Hydro's transmission assets and to ensure access to the transmission system for producers of electricity in BC. The Crown Corporation operates independently of BC Hydro. Accessing the grid in BC is a separate process from the permitting process for construction and development of a power project. However, BC Hydro governs Interconnection Agreements (IAs) for projects with voltages less than 35kV, while the BCTC governs those higher than 35kV which are interconnected directly to the system.

In order to connect a water power project with the BCTC transmission network, an application must be submitted. This process is often completed prior to embarking on the permitting process with BC Hydro as the applicant is responsible for the interconnection costs with BCTC which can vary depending on the project. The physical point of interconnection is determined by BCTC and the power producer and is defined in the IA. Interconnection can occur via a power substation or by directly tapping an existing transmission line. The power generator is responsible for all minimum requirements (as per BCTC) for the design, installation, operation, maintenance and station facilities required to connect to the transmission lines. There are very strict regulations and compliance rules that must be adhered to in order to receive permission to connect to the BC transmission system.

We note that BCTC has recently announced that it will be upgrading BC's transmission assets over the next ten yeas at a cost of $3.2 billion. Most of the transmission structures in BC (18,000km of transmission lines, 22,000 steel towers, 10,000 wood poles and over 260 substations) was built in the 1950's and 60's. However, with an expected growth in electricity use by 45% over the next 20 years, these assets require enhancement and replacement. BCTC is focusing on increasing capacity, extending the life of existing assets and improving the reliability of power supply within the province.

Under the BC Hydro interconnection process for transmission lines up to 35kV, there are four steps to generator interconnection.

1. determine the feasibility of the connection
2. secure service agreements with BC Hydro
3. define interconnection requirements and sign an interconnection agreement
4. implement/commission the connection

We also note that BC Hydro has a net metering program for small generator of clean energy (<50kW) to connect to the hydro system in the province. When customers produce more energy than they consume, they can receive a credit from BC Hydro to be applied against future consumption. A net metering IA must be signed and permits/inspections must be obtained under the agreement terms.

## Approvals with First Nations

First Nations communities will almost always be impacted by any power project in BC. The potential impacts can range from changes to archeological sites and hunting or fishing territories to changes to the aesthetics of the environment, impacting ceremonial practices. Not all of the potential impacts to First Nations are negative, as First Nations stand to benefit economically

depending on the particular project. There may be employment benefits but also negotiated revenue sharing arrangements or one-time payments. Each First Nations community must be consulted directly and so separate agreements with each First Nations community involved in a single project are not uncommon.

Ultimately the Crown is obligated under law to consult with and accommodate First Nations when considering approval of these projects. The current provincial government in BC has a policy, The New Relationship, for interacting with First Nations. However, this does not intervene with the recommended approach for developers with First Nations communities i.e. to initiate a consultation, consider the impacts on First Nations and whether there is infringement of community rights, and then find ways to accommodate First Nations' interests and negotiate resolutions. First Nations have been receptive to the development of projects within their communities, if consulted in a timely and appropriate manner.

## 'Green Power' as per BC Hydro

The 'Green Power' designation as determined by BC Hydro can only be attained after a particular project is complete and operational. Though, prior to beginning operations, a project with an EPA from BC Hydro receive a letter indicating the likelihood of whether or not their projects meet the EcoLogo criteria. (we note that IPP low impact hydroelectric projects developed up until 2004 fall under the BC Hydro Green Criteria program – somewhat more specific but very similar to the EcoLogo program) The designation is based on what is called the 'EcoLogo' certification, sponsored by the Environmental Choice Program in Canada. The certification is not just for renewable and low-environmental impact electricity projects, but is used to certify thousands of products and services in Canada. Renewable, low-environmental impact electricity is defined as that derived from renewable sources of energy with low impacts on the environment and potential benefits such as low net greenhouse gas emissions, reduced emissions of pollutants, and low impacts on aquatic and terrestrial ecosystems and species.

The certification is important for the developer as there is a premium paid by BC Hydro for this 'green' power, but the certification historically has had little bearing on whether or not an EPA is granted. Going forward, in the Clean Power Call and the SOP, the power supplied by projects requesting an EPA must be considered 'clean' as defined by the BC Ministry of Energy, Mines and Petroleum Resources, whether it is EcoLogo certified or not. BC Hydro does have the power to withdraw the premium paid for green power if it determines that the EcoLogo criteria have not been met, yet BC Hydro is not at all involved in the EcoLogo approvals process.

Terrachoice is a third party auditor employed by the Environmental Choice Program to review projects seeking certification and is present on the first day of a project's operation. The EcoLogo criteria include the following:

- Government, industrial safety and performance standards have been met
- Government acts, by-laws and regulations have been met
- Community and stakeholder consultation adequately addresses any issues and potential impacts
- Provide evidence that conflicting land use, biodiversity losses and recreational and cultural values are addressed
- Provide evidence that the project will not permanently impact the site's heritage, cultural, recreational or tourist value
- Provide evidence that no adverse impacts are created for species designated as endangered or threatened

- Various clauses provide guidelines as to the marketing and commercialization of the end product to consumers and regulatory authorities

In addition to the listed criteria, there are a number of items that apply specifically to water powered projects, including:

- The Fisheries Act and other regulations related to water flows must be adhered to (no changes/waivers are allowed after EcoLogo certification is granted)
- No project will remain operational that allows the 'harmful alteration, disruption or destruction' (HADD) of fish habitat unless the loss of this habitat is compensated by the creation of a similar habitat at or near the development site
- Plant operations must be coordinated with other facilities on the same waterway
- The flow of water out of a head pond must equal that of the flow into a head pond in any 48-hour period i.e. it is a true run-of-river project with no storage capacity (environmental impact assessments may be submitted for review under the Environmental Choice Program where this criterion cannot be met and sometimes approval is still granted)
- Water flows and water quality must be maintained so that the indigenous aquatic species are not adversely impacted

The Environmental Choice Program requires complete access to all project information and right of access to production facilities at any time, without prior notification. Ultimately it is left to the developer to provide all required information for verification of claims in accordance with the EcoLogo criteria. The ECP does not necessarily verify the documentation provided by the developer, though compliance with the criteria must be attested to via signed statement by the CEO. The difficulty comes in determining the true environmental impacts of a particular project, many of which may not become apparent for some time. However, the program does address the minimum acceptable levels of impacts, which can be reviewed at any time.

A green power certificate (GPC) represents the environmental benefits of using one megawatt hour (MWh) of electricity that has been generated by a project certified by the EcoLogo certification program in BC. For each GPC purchased by an organization in BC (sold by BC Hydro), an equal amount of green electricity enters the transmission grid in BC, thus reducing greenhouse gas and other toxic air emissions. The majority of the green electricity generated in recent years to fulfill the purchase requirements of GPCs has been generated by small hydro projects in the province. The mix of green power as of February 1, 2007 was 91% small hydro and 9% landfill gas, however the mix changes as new projects come on line or when all GPCs produced have been sold. While many companies have previously submitted applications for EcoLogo certification and thus a credit for green power supply in previous Calls for Power, the expectation was that many of them would retain these credits in future Power Calls. However, the draft terms recently released by BC Hydro for the Clean Power Call and the SOP indicate that these credits must be turned over to BC Hydro in order for an EPA to be granted. As previously discussed, this will likely be an issue of contention however IPPs need the EPA contracts and so won't be a deal breaker. Perhaps there will be some negotiation around this prior to the finalization of the Call design.

Emission reduction credits (ERCs) are also representative of the offset of 1 tonne of greenhouse gas emissions (GHGs). However, these negotiable financial instruments allow for the sale of emission displacements via tax credits to companies that do not stand up to the regional environmental standards. ERCs are currently traded on the Chicago Climate Exchange for all GHG emissions and is the only trading system in North America. Though carbon futures are soon expected to be traded on the Montreal Exchange through a joint venture with Chicago.

# Plutonic Power Corporation (PCC–T, $7.60)

## *Watts in a River?*

**INITIATING COVERAGE:** *SECTOR OUTPERFORM*
*Target Price: $10.00* *Risk: SPECULATIVE*

**Investment Brief** – We are initiating coverage of Plutonic Power Corporation with a target price of $10.00 per share, which translates into a Sector Outperform rating. Plutonic Power is a developer of run-of-river hydro power projects in BC, with one of the largest run-of-river power development portfolios. We expect the next critical milestones that are likely to drive long term value for the company are the announcement of its tender of a number of projects into the Clean Power Call (formerly the 2007 Call for Power) and any resulting EPA's to be awarded (expected fall-2008).

- **East Toba/Montrose Projects** – Plutonic is currently in the construction phase of these two projects with total capacity of 196MW. GE Energy Financial Services (a unit of GE; NYSE-GE) has partnered with Plutonic to provide financial support in this project costing about $660 million, in return for an economic interest of 60% over the life of the 35-year electricity purchase agreement with BC Hydro (reverting to 49% thereafter). The projects are expected to be operational in mid-2010.
- **Development Project Portfolio** – Plutonic has a development portfolio of 34 run-of-river projects with 1.7GW capacity (5,500 GWh) that are expected to be advanced and contracted to supply BC Hydro with power over the next several years.
- **BC Hydro Clean Power Call** – We expect Plutonic to be active in the upcoming tender for the Clean Power Call, with submissions to contract at least 1.0GW of its capacity. We expect Plutonic to be successful with a number of contract awards, given management's proven ability to execute on environmental permitting, First Nations agreements, and financial partnering.
- **Valuation** – We value Plutonic using a probability adjusted discounted cash flow model and derive a price target of $10.00 per share. In our assumptions, we use a 10% discount to equity, EPA contracts of 35 years, projects lives of 50 years, an interest rate of 6-6.5% and attrition rates of 15-40% depending on the project. The sensitivity of the share valuation to these assumptions is high, placing a range about the target price of $6.42-14.48. The weighted average project attrition rate assumptions produce a target price range of $8.78 to $10.78.


**Tania Maciver (416-507-2601, tmaciver@haywood.com)**
Tim Miller (416-507-2309, tmiller@haywood.com)

# EXECUTIVE SUMMARY

| | |
|---|---|
| **Target Price** | **$10.00** |
| Current Price | $7.60 |
| Return | 32% |
| 52-Week High / Low | $8.00 / $1.80 |
| Shares O/S | 39.6 million (basic)<br>47.4 million (F/D) |
| Market Capitalization | $293 million |
| Daily Volume (3-month average) | 120,000 |
| President and CEO | Donald McInnes |
| Company Web Site | www.plutonic.ca |

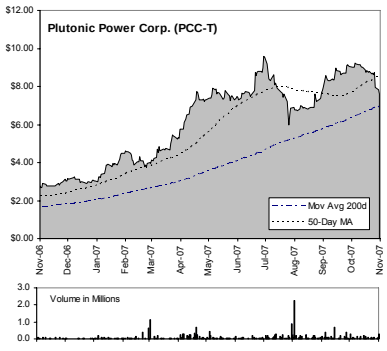
**Revisions, Date of Record·**
Target: $10.00
Rating: Sector Outperform

| | |
|---|---|
| **Risk Profile** | Speculative |
| Forecast Risk | High |
| Financial Risk | High |
| Valuation Risk | High |

**Industry** – Alternative Energy

**Company Profile** – Plutonic Power is a developer of run-of river hydro projects in BC.

**Price Performance**




Source: Bloomberg

We are initiating coverage of Plutonic Power Corporation with a target price of $10.00 per share, which translates into a Sector Outperform rating. We expect the next critical milestones that are likely to drive long term value for the company are the announcement of its tender of a number of projects into the Clean Power Call (formerly the 2007 Call for Power) and any resulting EPA's to be awarded (expected fall-2008).

PCC is well positioned to benefit from the increasing demand for power in BC and provincial energy mandates with a portfolio of 34 Run of River projects in development (1.7GW capacity with 5,500GWh of annual electricity) that are expected to be advanced and contracted to supply the province with additional power over the next several years. PCC has 27 projects within the "Green Power Corridor" (GPC) with an estimated potential capacity of 1.5GW, many of which are expected to be tendered into BC's Clean Power Call, and two contracted projects (East Toba, 123 MW and Montrose, 73 MW), both granted 35-year term Energy Purchase Agreements (EPAs) with BC Hydro in the 2006 Call for Power. PCC has successfully attained a provincial Environmental Assessment Certificate for these projects and the transmission line, signed an impact benefits agreement with Klahoose, Sliammon and Sechelt First Nations, attained interconnection agreements with BCTC, secured financing with GE Energy Financial and negotiated a fixed-price construction contract that is expected to move the projects to commercial operation in mid-2010.

A key catalyst for PCC in the near term is the upcoming BC Clean Power Call from which we expect PCC to be awarded multiple long-term EPA contracts for its other sites targeted for operation in the 2010-2015 timeframe. While PCC is competing with other run-of-river IPPs, as well as those with other technologies for electricity generation, run-of-river projects typically dominate the wins for EPAs (in the 2006 Call for Power about 60% were run-of-river projects). In addition, with the Clean Power Call size of 5,000GWh and a potential adjustment for expected attrition/delays of 15-40%, we would expect issued contracts to surpass the targeted Call size. As such, we expect a majority of contracts enetered into the Clean Power Call are likely to be awarded EPA contracts.

PCC does not have an operating history as a power generating company but has been focused on the development of a number of run-of-river hydro projects in BC. With 196MW of electricity contracted under a 35-year EPA with BC Hydro, a financial partnership with GE Energy Financial Services, secured project financing and a fixed price construction contract, PCC is set to transition from an early stage renewable power company to an emerging revenue generating Independent Power Producer (IPP) with a large pipeline of projects (over 1.5GW) that are well positioned to come on line in the medium term (a project can take anywhere from 2 to 5 years to develop). It is also not unreasonable to expect that PCC could be an acquisition target, given the attractive potential of its project portfolio.

## *Plutonic Power Corporation* *(PCC-T,$7.60; TP: $10.00)*

## *Sector: Alternative Energies* **(Sector Outperform)**

## *Sub-sector: Run-of-River Hydro Power*

CAPITAL MARKETS HAYWOOD SECURITIES INC.

### Company Overview

Plutonic Power Corporation is an independent power producer (IPP) and developer of environmentally friendly and clean power in the province of British Columbia. PCC has 196MW under construction with 35 year EPA's and is expected to be awarded multiple EPA's in BC Hydro's upcoming Clean Power Call.

### Investment Brief

- Energy demand in BC is forecast to grow at 25% to 45% in next 20 years
- PCC is well positioned with 34 run-of-river projects expected to be advanced
- BC Hydro to rely on IPPs to mitigate projected energy supply deficit
- 2007 BC Energy Plan mandates clean energy use, eliminate energy deficit by 2016
- BC Hydro upcoming Calls for Tender present near term catalysts to PCC stock
- PCC has 2 contracted projects, each with proposed commercial operation dates in 2010 with an installed capacity of 196MW

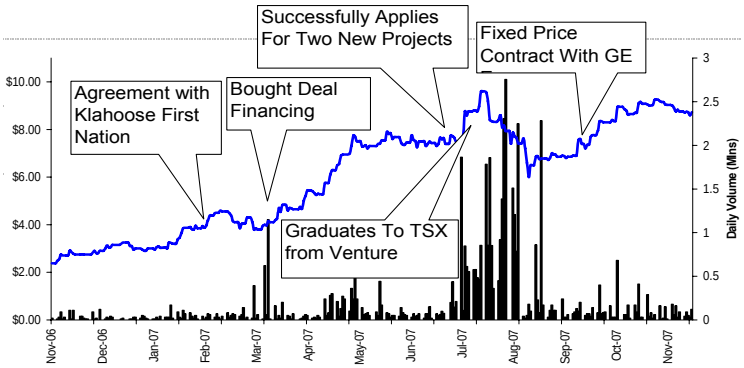
### Catalysts

- H1 2008 – Submissions to the BC Hydro Clean Power Call
- H2 2008 – Clean Power Call implementation and awarding of contracts to IPPs
- H2 2008 – Issuance of contracts (EPAs) to PCC for a stated number of MW
- 2008 – Progress on permitting process for projects submitted to the Clean Power Call including updates on First Nations relationships
- 2008 – Progress to secure financing or JV partnerships for projects awarded contracts in the Clean Power Call

### Risks

- Construction costs and development timelines may be higher and longer than anticipated, affecting profitability
- Opposition from local communities and First Nations may prevent permitting
- Unanticipated negative environmental impacts - ie: Rainy River cancellation
- PCC may not be able to secure favourable financing terms, if at all
- Risk exists that rainfall and weather patterns negatively affect capacity and therefore revenue and return expectations
- Regulatory and subsidy changes may favour alternative energies over PCC

### One year price performance




### Development Portfolio


### Share Data

| | | | |
|---|---|---|---|
| **Current Price** | | | *$7.60* |
| **Market Cap.** (mm) | | | *301.2* |
| **52wk Hi / Lo** | *$8.00* | - | *$1.80* |
| **Shares O/S** (mm) | | | |
| Basic | | | *39.6* |
| F.D. | | | *47.4* |
| Float | | | *30.9* |
| **Daily Volume (3-Mth. Avg. mm)** | | | *0.12* |
| **Options (2006 Fiscal Year-End)** | | | |
| Avg. Strike / Basic | *$1.03* | - | *$2.18* |
| **Warrants (2006 Fiscal Year-End)** | | | |
| Avg. Strike / Basic | *$1.95* | - | *N/A* |
| Dividend Yield | | | *N/A* |
| Short Interest | | | *N/A* |
| Short Interest % of Float | | | *nmf* |

### Financial Information

| | |
|---|---|
| **Enterprise Value** (mm) | *279.9* |
| **Cash** (mm) | *23.7* |
| **Debt** (mm) | *2.7* |
| **Net Cash / Share** | *$0.53* |
| **Tang. Book Value / Share** | *$1.61* |
| **Last Financing:** | |
| Equity Offering | *4/18/2007 for 7.1M @ $4.55* |
| Debt Offering | N/A |

### Company Info & Ownership:

| | | |
|---|---|---|
| Company President | | *Donald A. McInnes* |
| Company Website | | *www.plutonic.ca* |
| **Top Institutional Holders:** | | |
| 1) Fidelity (Pyramis, Management & Investments Canada) | | *14.87%* |
| 2) CIBC Asset Management | | *3.24%* |
| 3) AGF Management Ltd. | | *1.81%* |
| **Total Institutional Holdings:** | | *21.45%* |
| **Ownership:** | | |
| Management Control | *4.57 M* | *11.53%* |
| | | |
| Analyst Coverage: | | 4 |
| Average Target Price: | | *$12.20* |

### Project Valuation

| Project | Price/MWh | Project Start Estimate | NAV (000's) | NAV/shr | Attrition adjustment | Total |
|---|---|---|---|---|---|---|
| East Toba/Montrose | 90 | mid-2012 | 76,457.1 | 1.70 | 0% | 1.70 |
| **Uncontracted Projects** | | | | | | |
| GPC Phase II | 110 | 2013 | 50,564.8 | 1.12 | 15% | 0.96 |
| GPC Phase III | 110 | 2014+ | 285,556.3 | 6.35 | 15% | 5.40 |
| GPC Phase IV & V | 110 | 2016+ | 63,263.1 | 1.41 | 25% | 1.06 |
| Other | 110 | 2016+ | 50,411.3 | 1.12 | 40% | 0.67 |
| **Total** | | | | | | **9.78** |

**Source: Haywood Securities Inc., Company Reports; Capital IQ, Bloomberg**



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# PCC BUSINESS OPERATIONS

Plutonic Power Corporation (PCC), based in British Columbia (BC), is an independent power producer (IPP) and developer of environmentally friendly and renewable clean power, run-of-river hydro projects in the province. The company has identified 34 potential project sites with a total capacity of 1,700 MW of capacity or about 5,500 GWh of annual electricity supply. PCC's first supply contracts were granted in the 2006 BC Hydro Call for the East Toba River/Montrose Creek and the Rainy River projects. PCC plans to build two run-of-river generation facilities in the East Toba/Montrose projects, having begun construction in July 2007. However, in August 2007 PCC exited the EPA for the 15MW Rainy River project after having come up against some unexpected environmental difficulties in the permitting process. For the remaining projects in PCC's portfolio, the company is conducting the engineering, hydrological, and permitting studies, expecting to enter some of them in the next BC Hydro Call for Tender.

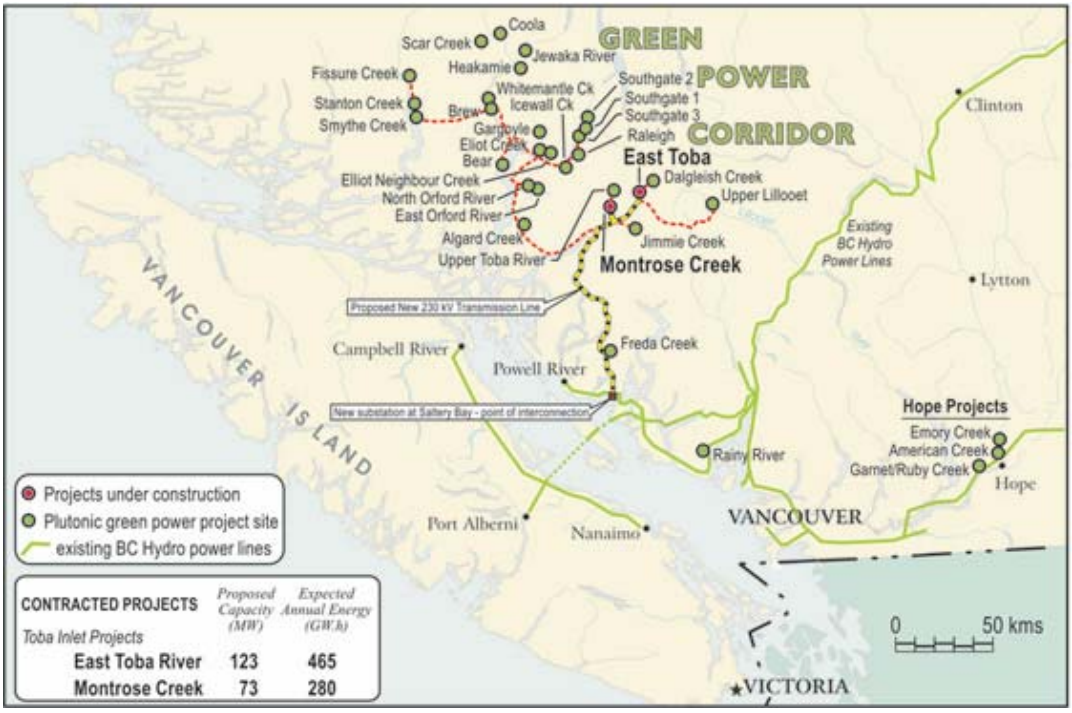
Table 10: Plutonic Power's Project Portfolio

| Plutonic Power Project Portfolio | |
|---|---|
| **Green Power Corridor Phase I** | |
| 1 | East Toba |
| 2 | Montrose |
| **Green Power Corridor Phase II** | |
| | **Upper Toba Valley** |
| 3 | Jimmie Creek |
| 4 | Dalgleish creek |
| 5 | Upper Toba River |
| **Green Power Corridor Phase III** | |
| | **Bute Inlet:** |
| 6 | Algard Creek |
| 7 | Brew Creek |
| 8 | East Orford |
| 9 | Elliot Creek |
| 10 | Elliot 'Neighbour' Creek |
| 11 | Icewall Creek |
| 12 | North Orford |
| 13 | Raleigh Creek |
| 14 | Southgate 1 |
| 15 | Southgate 2 |
| 16 | Southgate 3 |
| 17 | Whitemantle Creek |
| 18 | Jewakwa River |
| 19 | Scar Creek |
| 20 | Coola Creek |
| 21 | Gargoyle Creek |
| 22 | Heakamie River |
| **Green Power Corridor Phase IV** | |
| | **Bute Inlet:** |
| 23 | Bear River |
| | **Knight Inlet:** |
| 24 | Fissure Creek |
| 25 | Smythe Creek |
| 26 | Stanton Creek |
| **Green Power Corridor Phase V** | |
| 27 | Upper Lillooet river |
| **Hope Projects** | |
| 28 | Emory Creek |
| 29 | Ruby Creek |
| 30 | Garnet Creek |
| 31 | American Creek |
| **Other Projects** | |
| 32 | Europa Creek |
| 33 | Freda Creek |
| 34 | Rainy River |

Source: Company reports

The first contracted projects, the East Toba River/Montrose projects, are found within what PCC has termed the Green Power Corridor. This is a region in BC that PCC has estimated to have a potential of about 1.35GW in uncontracted development projects identified (26 projects) to bring into production and drive value in PCC going forward.

Figure 8: The Green Power Corridor

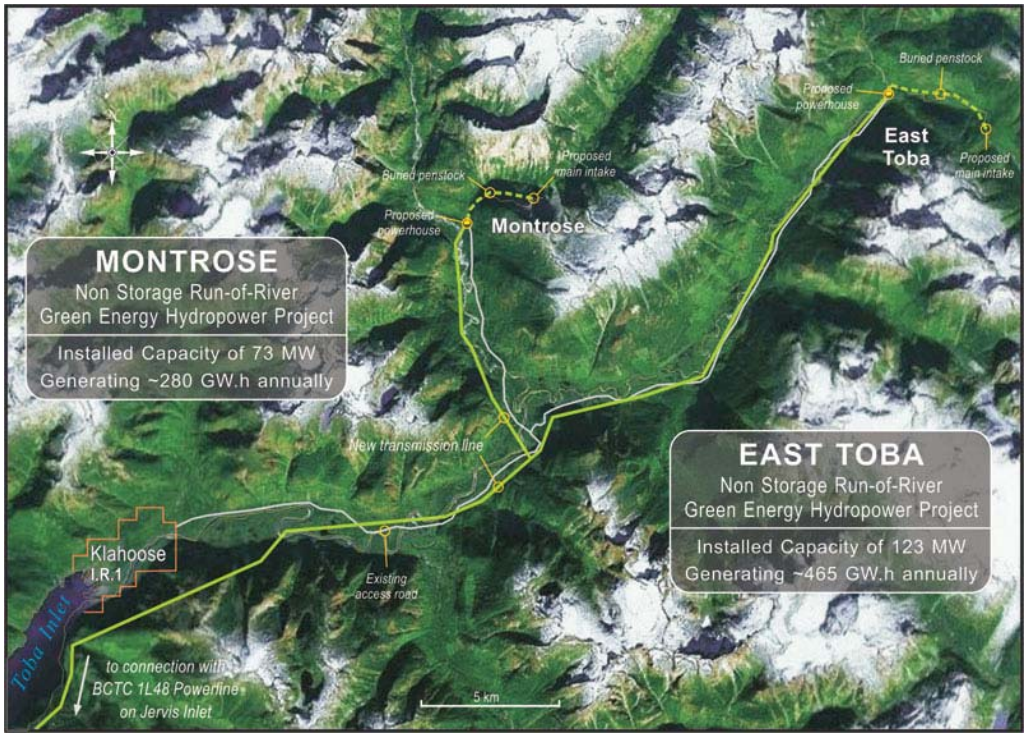



Source: PCC website

## *East Toba River/Montrose Creek Project – Green Power Corridor Phase I*

PCC has signed an EPA with BC Hydro to supply approximately 745GWh (196MW capacity) of electricity annually in the Toba Inlet (~130km north east of Powell River). Both projects, East Toba River (123MW) and Montrose Creek (73MW) have each been awarded EPA contracts from BC Hydro for a 35-year term. The commercial operation date of the projects is expected to be July 2010 with direct construction costs of about $500 million and total costs of $660 million. Once constructed, the projects will have the capability of supplying electricity for about 75,000 homes. Further, it is estimated that 455,000 tonnes of greenhouse gases (GHGs) will be displaced each year, the equivalent of removing 80,000 cars from the road. The two projects will be connected to the BC Transmission Corp (BCTC) through a new substation at Saltery Bay from which a new 230kv transmission line will be directed to the project sites (about 20% of the project's capital costs). There is an extensive network of logging roads through this area and so the projects are designed to cause minimal environmental disturbance throughout the construction process.

Figure 9: East Toba and Montrose Creek




Source: PCC website

Permitting for this project was completed and the construction began in July 2007, as per expectations. The combined capital cost for the two projects is estimated at $3.4M/MW which includes about $2.6M/MW of infrastructure build for this portion of the Green Power Corridor project plan. We note that the emissions reduction credits (ERCs) associated with these projects could provide significant long term value to PCC with an estimated displacement of just under 2 million tonnes per year of GHGs. However, with the first phase of the GPC project plan, PCC submitted its credits to BC Hydro in trade for a $3/MWh credit in the bid application process for the 2006 Call for Power (note this was a credit posted to PCC during the bid levelization process and not direct compensation). Prices for ERCs could increase significantly as the possibility for a new North American cap and trade system for ERCs becomes more likely and as governments issue levies/taxes against those emitting GHGs and other harmful gases into the environment. However, the draft terms presented in the Clean Power Call mandate that all green/environmental attribute accrue to BC Hydro, and that the associated credit be included in the bid price. We expect this to be an issue of significant discussion prior to the finalization of terms for the Clean Power Call. We had previously expected most IPPs would retain their project green/environmental credits if given the choice in the Clean Power Call.

Table 11: Concept Descriptions

| East Toba River | |
|---|---|
| Intake | The intake structure will be located about 5km upstream of the East Toba River's confluence at an elevation of 690m. There will be a low gated concrete weir with an inflatable rubber dam, concrete retaining walls and earth embankments. The intak will contain a sediment trap, screens, isolating gate and scour gate for the diversion of the creek's flow into the penstock. |
| Water conveyance | This will consist of a low pressure conduit and penstock, located on the right bank of the river. The low pressure conduit will be an HDPE pipe running 1000m in length from the intake structure to the penstock. The penstock will be about 3800m in length buried about 1.2m deep. The conveyance will be about 3m in diameter. |
| Powerhouse | This will be located 60m upstream of East Toba River's confluence at an elevation of 125m. |
| Transmission line | A 230kV transmission liine will run from the East toba River powerhouse to Saltery Bay, about 148km in length following the existing logging roads and hidden from view where possible. A new 138/230kV substation will be built near Saltery Bay, the point of interconnection with BCTC. |
| Interconnection | This will occur at the new substation to be built near Satlery Bay, connecting the new transmission line from the Toba inlet to the BCTC grid. |

| Montrose Creek | |
|---|---|
| Intake | The intake structure will be located about 5km upstream of the Montrose Creek's confluence at an elevation of 512m. There will be a low gated concrete weir with an inflatable rubber dam, concrete retaining walls and earth embankments. The intak will contain a sediment trap, screens, isolating gate and scour gate for the diversion of the creek's flow into the penstock. |
| Water conveyance | This will consist of a low pressure conduit and penstock, located on the right bank of the creek. The low pressure conduit will be an HDPE pipe running 1800m in length from the intake structure to the penstock. The penstock will be about 2200m in length buried about 1.2m deep. The conveyance will be about 1.9m in diameter. |
| Powerhouse | This will be located 500m upstream of Montrose Creek's confluence with Filer river confluence at an elevation of 55m. |
| Transmission line | A 230kV transmission liine will run from the East toba River powerhouse to Saltery Bay, about 148km in length following the existing logging roads and hidden from view where possible. The Montrose Creek project will interconnect to this new line. A new 138/230kV substation will be built near Saltery Bay, the point of interconnection with BCTC. |
| Interconnection | This will occur at the new substation to be built near Satlery Bay, connecting the new transmission line from the Toba inlet to the BCTC grid. |

Source: PCC website

The components of the construction project include:

- Roads – upgrades of existing logging roads, and the repair and installation of bridges
- Intake structures – these serve to divert water from the creek/river into the pipes that carry the water to the turbines and consist of a concrete weir, retaining walls, earth embarkments, gates, screens and sediment traps
- Water conveyance systems – high density polyethylene pipes carry water from the intakes to the penstocks (steel pipe buried underground carrying water to spin the turbines); the East Toba and Montrose project require about 4.8km and 4.0km of pipe respectively
- Powerhouses – these house the turbines and generators
- Transmission line – a 230kV line will be constructed on wood poles to 148km from the East Toba project to Saltery Bay where the Montrose project will be connected
- Camp/offices/shops – these structures will serve as headquarters for the project and serve as housing for workers on the project
- Support services – these will be required to support the project development through the construction phase including transportation services, telecommunications links and food services for staff

## A Financial Partnership with General Electric (GE)

PCC announced a joint venture partnership with GE Energy Financial Services (GE) to finance and develop the East Toba/Montrose projects in May 2007. GE agreed to invest up to $112M ($100M in equity and $12M slated for cost overruns) to acquire a 49% equity stake in both projects and a 60% economic interest in the project for the 35 years of the EPA and be granted the right to debt finance the project ($470M in senior secured debt co-led with Manulife Financial). PCC retains a 40% economic interest and 51% equity stake for the life of the 35-year EPA that reverts to a 51% economic interest to PCC and 49% economic interest to GE thereafter. Additionally, the JV agreement will provide a $30 million credit facility to PCC to increase the capacity of the 230 KW transmission line from the Toba Valley to Saltery Bay, BC. This should allow PCC to retain rights (subject to priority use agreements) to any additional capacity of the line to be used for other PCC projects in the Toba Valley. Additional terms of this agreement include:

- The grant of two-year common share purchase warrants by PCC to GE for 375,000 warrants at a price of $2.50/shr and 650,000 warrants at a price of $9.03/shr;
- A contingency facility for potential overruns will be established by GE for about $30 million;
- A three year credit facility for $100 milion will be set up by GE for repayment coinciding with the start of commercial operations;
- Of the project expenses funded to the end of October 2007, PCC expects to recover about $40 million;
- GE has agreed to post the $12 million performance bond required by BC Hydro;
- GE has the right to participate in an additional 200MW of power projects in BC with PCC.

## A Fixed Price Contract with Kiewit

Together with partner, GE Energy Financial Services, PCC negotiated a fixed-price construction contract with Peter Kiewit Sons Co. (Kiewit) to build the East Toba/Montrose run-of-river hydro project (powerhouses, intakes, penstocks and transmission line) for $500 million. The engineering, procurement and construction contract (EPC) for the development of two power generating stations, including intakes, penstocks and a transmission line ties the construction progress to specific timelines. Target completion dates for the projects are Q3 2010 for East Toba and Q4 2010 for Montrose. Any increased cost associated with delays in construction timelines will be borne by Kiewit under the terms of the fixed price contract. Kiewit has been working on the rejuvenation and construction of 60km of roads and 11 bridges to the power generating stations in July 2007.

## Impact Benefits Agreements with First Nations

The projects are located within the traditional territories of the Klahoose, Sliammon and Sechelt First Nations. Agreements have been negotiated with each of these communities, providing for economic benefits and

### *Rainy River Project*

PCC was granted an EPA for its Rainy River Project, located near the town of Gibson (16km away), in the F2006 BC Hydro Call for Power. The project has the potential to generate 53GWh/yr of electricity. The project has since been placed on hold, after having spent approximately $1.5 million in pre-development work and another $0.2 million for exiting the EPA contract. The pre-development had always shown that there was no fish present in the river, until closer to construction time, the fish studies found that there were a number of fish present in the river. The regulator then would not allow the powerhouse to be constructed at that point in the river.

PCC has an 80% interest in the Rainy River project, with the remaining 20% owned by howe Sound Pulp and Paper (HSPP). Under the terms of the agreement with HSPP, PCC would be reimbursed for construction costs in addition to a 10% fee. HSPP would not receive return on its economic interest (i.e. 20% of revenue) until all of Plutonic's capital was fully paid back. PCC is currently reviewing alternatives for the project while it moves ahead with other more viable projects.

Figure 10: Rainy River Project Plans


Source: PCC website

## *PCC's Development Pipeline*

Sites that are situated closer to areas of high demand use and those with lower line losses are likely to have a lower capital cost and greater likelihood of being awarded an EPA. Additionally, a project's ability to connect to the provincial power grid without having to build significant infrastructure or transmission lines will also have a lower capital cost. Both of these scenarios (close proximity to city or town, as well as ability to directly connect to the grid) will favourably impact a project's likelihood of being permitted and, eventually supply additional renewable electricity to the BC power grid. PCC's portfolio of development projects within the Green Power Corridor would be well positioned in this regard, given the ability to share infrastructure and related costs for some projects, financing arrangements, consulting and engineering costs and possibly material inputs. It is this portfolio of projects, and for these reasons, that we believe PCC stands to benefit in the Clean Power Call.

**Capital Costs** - We estimate that capital costs for projects in the future are at a minimum of $2.0-3.0 million per megawatt. The projects that require new infrastructure are likely to be at the high end of the range and those sharing existing infrastructure, at the low end of the range.

**Bid Pricing** - In terms of levelized bid pricing, we expect most of the 27 projects in the GPC to be submitted into the Clean Power Call at a bid price of at least $110/MWh. With the retention of the green credits by BC Hydro for all projects awarded EPA contracts in this Call, and the inclusion of the green credit value in the bid price, we expect bid prices to be much higher than in previous Calls. We believe it is also reasonable to expect companies to request a benefit attributed for the green credits for much greater than the $3/MWh offered in previous Calls.

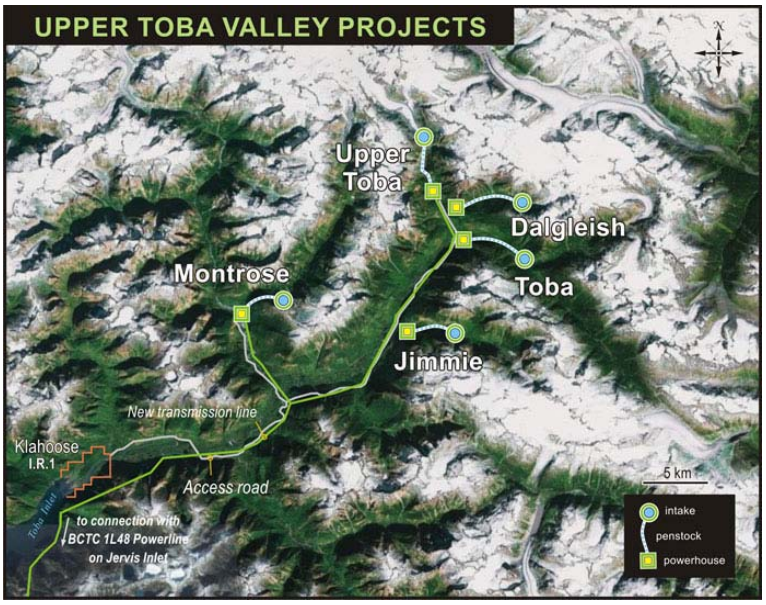
## Table 12: Plutonic Power's Project Locations

| | Projects | Capacity (MW) | GWh | Potential number of homes powered | Expected to Submit in Clean Power Call | Est. Capital Cost ($M) |
|---|---|---|---|---|---|---|
| | **Green Power Corridor Phase I** | | | | | |
| 1 | East Toba | 123 | 465 | | - | |
| 2 | Montrose | 73 | 280 | | - | |
| | **TOTAL CONTRACTED** | **196** | **745** | **75,000** | | **$660** |
| | **Green Power Corridor Phase II** | | | | | |
| | **Upper Toba Valley** | | | | | |
| 3 | Jimmie Creek | 50 | 169 | | √ | 150 |
| 4 | Dalgleish creek | 28 | 95 | | √ | 84 |
| 5 | Upper Toba River | 41 | 128 | | √ | 123 |
| | **Total Toba Valley** | **119** | **392** | **39,200** | | **$357** |
| | **Green Power Corridor Phase III** | | | | | |
| | **Bute Inlet:** | | | | | |
| 6 | Algard Creek | 22 | 80 | | √ | 66 |
| 7 | Brew Creek | 82 | 243 | | √ | 246 |
| 8 | East Orford | 28 | 91 | | √ | 84 |
| 9 | Elliot Creek | 61 | 182 | | √ | 183 |
| 10 | Elliot 'Neighbour' Creek | 36 | 122 | | √ | 108 |
| 11 | Icewall Creek | 73 | 244 | | √ | 219 |
| 12 | North Orford | 22 | 69 | | √ | 66 |
| 13 | Raleigh Creek | 41 | 123 | | √ | 123 |
| 14 | Southgate 1 | 143 | 425 | | √ | 429 |
| 15 | Southgate 2 | 42 | 124 | | √ | 126 |
| 16 | Southgate 3 | 66 | 196 | | √ | 198 |
| 17 | Whitemantle Creek | 83 | 247 | | √ | 249 |
| 18 | Jewakwa River | 95 | 287 | | √ | 285 |
| 19 | Scar Creek | 60 | 187 | | √ | 180 |
| 20 | Coola Creek | 32 | 94 | | √ | 96 |
| 21 | Gargoyle Creek | 28 | 86 | | √ | 84 |
| 22 | Heakamie River | 48 | 142 | | √ | 144 |
| | **Total Bute Inlet** | **962** | **2,942** | **270,000** | | **$2,886** |
| | **Green Power Corridor Phase IV** | | | | | |
| | **Bute Inlet:** | | | | | |
| 23 | Bear River | 38 | 133 | | | 114 |
| | **Knight Inlet:** | | | | | |
| 24 | Fissure Creek | 56 | 172 | | | 168 |
| 25 | Smythe Creek | 31 | 95 | | | 93 |
| 26 | Stanton Creek | 65 | 199 | | | 195 |
| | **Total Knight Inlet** | **190** | **599** | **40,000** | | **$570** |
| | **Green Power Corridor Phase V** | | | | | |
| 27 | Upper Lillooet River | 81 | 267 | | | 243 |
| | **Hope Projects** | | | | | |
| 28 | Emory Creek | 7 | 28 | | | 21 |
| 29 | Ruby Creek | 8 | 29 | | | 24 |
| 30 | Garnet Creek | 16 | 58 | | | 48 |
| 31 | American Creek | 7 | 18 | | | 21 |
| | **Other Projects** | | | | | |
| 32 | Europa Creek | 81 | 280 | | | 243 |
| 33 | Freda Creek | 26 | 80 | | | 78 |
| 34 | Rainy River | 14 | 53 | | | 42 |
| | **Total** | **240** | **813** | | | **720** |
| | **TOTAL CONTRACTED & UNCONTRACTED** | **1,707** | **5,491** | | | **$5,193** |

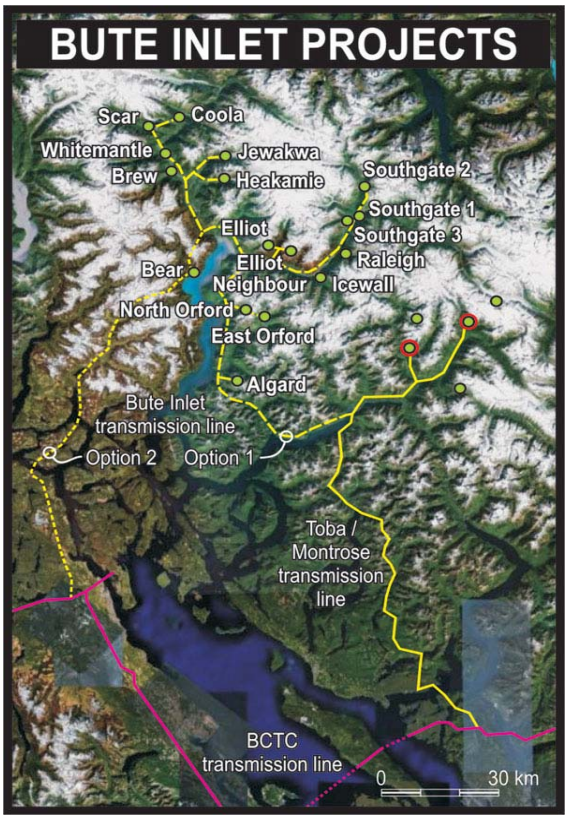
Source: Company Reports

## Green Power Corridor

- **Phase II** – Included in this phase are three projects with total capacity of 119MW, Dalgleish Creek, Jimmie Crek and the Upper Toba River;




- **Phase III** – The Bute Inlet projects (18 in total) with total capacity of 962MW are grouped into Phase III (except for one project, Bear River)



- **Phase IV** – The Knight Inlet project has three planned facilities for Smythe Creek, Stanton Creek and Fissure Creek totaling 152MW capacity; Also grouped into Phase IV is the Bear River project from Bute Inlet (38MW capacity)
- **Phase V** – The final phase of the GPC is the Upper Lillooet River project with a bout 81MW capacity

### Hope Projects

This development has three sties targeted, Ruby/Garnet Creek, American Creek and Emory Creek, located within 30km of Hope, BC. A bid for Emory Creek was submitted into the 2006 Call for Power in BC, however a contract was not awarded by BC Hydro. It was likely that the levelized bid price for that project was too high at the time. The three projects less than 10MW of capacity (Emory, Ruby and American Creeks) could qualify for the BC Standing Offer Program in 2008. However, the fixed pricing structure in this program may be a constraint.

### Europa Creek and Freda Creek Projects

These two projects require more significant infrastructure build than other projects in PCC's development portfolio. There is currently no access by water/road to the Europa Creek site and so the project is tied up in the early stages of the permitting process. Stages 1 and 2 in the permitting process have been achieved for the Freda Creek project, however there is currently no road access to the site, requiring some infrastructure build. It is likely that these more difficult projects will take longer to move through the permitting process and will be some of the last to be submitted in a Call for Power.

## *An Acquisition Candidate*

We expect that PCC could reasonably be an acquisition target for a number of utility, oil and gas, pipeline, mining and other renewable energy companies. With increased focus on greenhouse gas and other air emissions by federal governments around the world, PCC's portfolio of renewable projects with zero emissions could be viewed as an attractive target. We expect that as levies are mandated by federal governments for those not complying with reduction targets, green/environmental credits are likely to become a very valuable currency.

# FINANCIALS

## *Contracted Project Revenue Estimates*

PCC is not expected to become a revenue generation corporation until mid-2010 when its first ru-of-river project, East Toba River, begins commercial operations, followed by the Montrose Creek projects shortly thereafter. In estimating revenue projections for PCC, we have currently included only those projects that have been awarded EPA contracts by BC Hydro. While we believe that PCC will be awarded additional contracts in the Clean Power Call, we believe it is too early in the development of these projects to begin accruing revenue streams for them.

Our revenue projections are based on the following assumptions:

- East Toba and Montrose projects will begin commercial operations mid-2010 and beginning 2011 respectively;
- The total annual production for both projects is 745GWh;

- Run-of-river projects have an estimated life of 50 years (following this replacements and refurbishments would normally be required);
- We use a base price per megawatt hour in 2010 of $90, growing at one-half of annual CPI growth throughout the 35-year contract period; we assume that an EPA is recontracted for the remaining 50 year life of the project at $115 per MWh, again growing at one-half of annual CPI;
- PCC holds a 40% economic interest in these two projects until the end of the 35-year contract, growing to 51% thereafter; GE Energy Financial Services is providing the equity component of the capital costs;
- East Toba and Montrose projects are eligible for the $10/MWh ecoEnergy credit for ten years;
- We assume the projects will become fully taxable within 10 years.

### *Project Valuations*

In order to determine a value for PCC and its run-of-river project portfolio we separated the project portfolio into contracted projects, near term development projects and other projects and conducted a discounted cash flow analysis. The valuation assumptions we used were as follows:

- The contracted projects include the East Toba and Montrose Creek projects which we expect will become operational mid-2010 and early 2011;
- The near-term development projects include the GPC Phase II Upper Toba Valley projects, and the GPC Phase III Bute Inlet projects, as well as the Knight Inlet (GPC Phase IV) and Upper Lillooet River project (GPC Phase V); we assume these projects become operational in 2016 or later under the terms of Call for Power in 2009;
- The remaining projects including the Hope Projects and the Europa Creek, Freda Creek, and Rainy River projects are included in the last group; we assume these projects become operational 2017 or later;
- For each project, we estimate an average price paid by BC Hydro of between $90/MWh for earlier projects and $110/MWh for later projects with prices growing at 0.5*annual CPI over a contract term of 35-years; at the end of the contract, we flatline the pricing at $130/MWh for 15-years (50-year project life); we believe these prices are conservative given expectations for bid pricing in the Clean Power Call;
- The East Toba and Montrose Creek projects are the only ones that qualify for the federal ecoEnergy incentive of an extra $10/MWh;
- We assume EPA contracts of 35-year terms and project life of 50 year terms;
- We assume capital costs per megawatt hour of $3 million on average;
- Operating costs are assumed to be 20% of revenues;
- Debt financing for projects is generally assumed to be 70/30 debt to equity at a cost of debt of 6-6.5%, paid over the life of the EPA contracts;

  The total cost of financing all remaining projects in PCC's portfolio is estimated at about $5.2 billion, assuming a capital cost per megawatt of $3 million. For projects in which

Plutonic is willing to share its economic interest (such as the very large Bute Inlet projects), we assume that PCC economic interest is 50% and the partner's economic interest is also 50%, with the partner responsible for 100% of the equity requirements of the project or about 30% of the project funding requirements; (arrangement similar to that on the East Toba/Montrose projects partnered with GE Energy Financial);

- We assume debt maturity dates are matched to the end of EPA contracts;
- We use a discount to equity rate of 10%;
- We also assume a project attrition rate of between 15% and 40% for projects in the development pipeline, similar to the results of previous BC Hydro Calls for Power.

Project values under these assumptions are shown in Table 13 below.

Table 13: Project Valuations

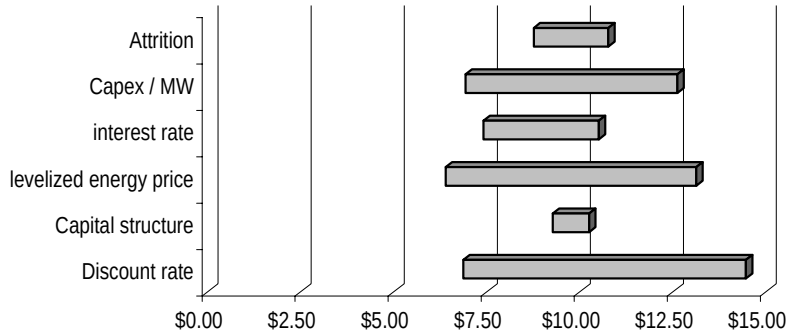
| Project | Capacity (MW) | Cost/MW ($M) | PCC Econ. Interest | Price/MWh | Project Start Estimate | NAV (000's) | NAV/shr | Attrition adjustment | Total |
|---|---|---|---|---|---|---|---|---|---|
| East Toba/Montrose | 196 | 2.5 | 40% | 90 | mid-2012 | 76,457.1 | 1.70 | 0% | 1.70 |
| **Uncontracted Projects** | | | | | | | | | |
| GPC Phase II | 119 | 3.0 | 100% | 110 | 2013 | 50,564.8 | 1.12 | 15% | 0.96 |
| GPC Phase III | 962 | 3.0 | 50% | 110 | 2014+ | 285,556.3 | 6.35 | 15% | 5.40 |
| GPC Phase IV & V | 271 | 3.0 | 100% | 110 | 2016+ | 63,263.1 | 1.41 | 25% | 1.06 |
| Other | 159 | 3.0 | 100% | 110 | 2016+ | 50,411.3 | 1.12 | 40% | 0.67 |
| **Total** | **1707** | | | | | | | | **9.78** |

Source: Company reports and Haywood estimates

## *Valuation and Target Price*

We are initiating coverage of Plutonic Power (PCC-T) with a target price of $10.00 per share, and a Sector Outperform rating. The sensitivity of PCC's valuation to discount rate, capital structure, levelized energy price, interest rate, assumed attrition and capital costs is significant. The potential range of impacts to our current assumptions is shown in Table 14.

Table 14: Discounted Cash Flow Sensitivity Ranges




| | Low | High |
|---|---|---|
| Discount rate | 12% | 8% |
| Capital structure | 60% | 80% |
| Levelized energy price | 95 | 125 |
| Interest rate | 7.5% | 5.5% |
| Capex ($M)/MW | 3.5 | 2.5 |
| Attrition | +10% | -10% |

Source: Company reports and Haywood estimates

# Run of River Power Inc. (ROR–V, $0.41)

## *Not Just Going With the Flow*

**INITIATING COVERAGE:** *SECTOR OUTPERFORM*
*Target Price: $1.25* *Risk: Speculative*

**Investment Brief** – We are initiating coverage of Run of River Power Inc. with a target price of $1.25 per share, which translates into a Sector Outperform rating. Run of River Power is a developer of run-of-river hydro power projects in BC, with one operational project under a 20-year contract with BC Hydro and a portfolio of about 13 additional projects. We expect the next critical milestones that are likely to drive long term value for the company are the announcement of its tender of a number of projects into the Clean Power Call (formerly the 2007 Call for Power) and any resulting EPA's to be awarded (expected fall-2008).

- **Brandywine Creek Project** – Run of River Power began accruing revenues from its Brandywine Creek project in August 2005 of about $2 million per year. Currently the project is operating ahead of projected capacity.
- **Development Project Portfolio** – Run of River has 13 projects in its development portfolio, of which 9 are expected to be submitted in to the upcoming Clean Power Call and 2 potentially into the Standing Offer Program.
- **BC Hydro Clean Power Call and Standing Offer Program** – We expect Run of River Power to be active in the upcoming tender for the Clean Power Call and Standing Offer Program, with submissions to contract at least 194MW of its capacity. We expect Run of River Power to be successful with a number of contract awards, given management's proven ability to execute on developing an operational plant.
- **Bioenergy Call for Power –** With the purchase of the outstanding shares of Western Biomass Run of River Power has diversified its renewable portfolio. Initial plans include the construction of a 50-100MW wood fired plant to produce electricity to the BC grid. It is expected that Western Biomass will be in a position to submit a bid in the Bioenergy Call for Power, after it finalizes terms for a joint venture agreement with the Tsilhqot' First Nations.
- **Valuation** – We value Run of River Power using a probability adjusted discounted cash flow model and derive a price target of $1.25 per share. In our assumptions, we use a 10% discount to equity, EPA contracts of 30 years, projects lives of 50 years, an interest rate of 6-6.5% and attrition rates of 15-40% depending on the project. The sensitivity of the share valuation to these assumptions is high, placing a range about the target price of $0.15-2.14. The weighted average project attrition rate assumptions produce a target price range of $1.09 to $1.40.

**Tania Maciver (416-507-2601, tmaciver@haywood.com)**
Tim Miller (416-507-2309, tmiller@haywood.com)

# EXECUTIVE SUMMARY

| | |
|---|---|
| **Target Price** | **$1.25** |
| Current Price | $0.41 |
| Return | 205% |
| 52-Week High / Low | $0.73 / $0.21 |
| Shares O/S | 61.9 million (basic)<br>101.5 million (F/D) |
| Market Capitalization | $25.7 million |
| Daily Volume (3-month average) | 70,000 |
| President and CEO | Jako Krushnisky |
| Company Web Site | www.runofriverpower.com |

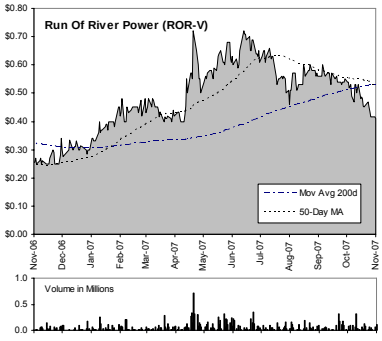
**Revisions, Date of Record·**
Target: $1.25
Rating: Sector Outperform

| | |
|---|---|
| **Risk Profile** | SPECULATIVE |
| Forecast Risk | HIGH |
| Financial Risk | HIGH |
| Valuation Risk | HIGH |

**Industry** – Alternative Energy

**Company Profile** – Run of River Power is an operator and developer of run-of-river hydro power projects in BC.

**Price Performance**




Source: Bloomberg

Run of River Power Inc. (ROR) operates the 7.6MW Brandywine Creek run-of-river hydroelectric power generation station in British Columbia. ROR was awarded a 20-year EPA with BC Hydro in the 2000/01 Call for Power and began operations at the facility during May 2005. Revenue began accruing to ROR on August 2, 2005. The project generates approximately $2M in revenue and $1.7M in EBITDA annually (assuming ~40GWh of production) now that it is running at optimum capacity on an annual basis. ROR also has a development portfolio of 13 additional run-of-river projects, 9 of which are to be submitted into the upcoming BC Hydro Clean Power Call which is targeting a minimum 5,000GWh/year of power, and 2 into the Standing Offer Program (SOP). These near-term development projects are situated within two power clusters, representing a design capacity of 194MW with generation potential of over 670GWh of renewable, green power annually - the 161MW Upper Pitt River and the 33MW Mamquam power clusters. The submission of these projects into the upcoming Clean Power Call/SOP and potential award of long-term EPAs from BC Hydro represents additional upside value potentially realizeable in the near to medium term for ROR. We expect that projects within each power cluster are likely to share infrastructure and development costs, potentially presenting cost advantages and efficiencies that attractively position ROR's submission into the Clean Power Call and SOP.

A key catalyst for ROR in the near term is the upcoming BC Clean Power Call into which we expect ROR to submit 194MW of development projects. Following this event a major catalyst within the investment horizon (assuming the projects are awarded an EPA from its submission into the Call) would be a successful amendment to the Pinecone Provincial Park boundary (through which a transmission line from the Upper Pitt River project is to run) or land use permit to allow the poles securing the transmission line to occupy Provincial Park lands (visual qualty and biological issues at play). Legislative approval for this park crossing allowance, if successful, would be expected to happen late spring/early summer 2008. Additional potential upside for ROR are its additional projects that may be submitted into the Standing Offer Program for projects under 10MW in size and development projects that may be submitted in future Calls for Power.

## *ROR Diversifies its Renewable Portfolio*

More recently (August 2007), ROR purchased the outstanding shares of Western Biomass in a 3.8 million share swap valued at just under $2.5 million. The business strategy at Western Biomass include plans for wood fired plants to produce electricity for the BC grid starting with initial plans to construct a 50MW to 100MW plant located within the territories of the Tsilhqot'in National Government (TNG), the First Nations territories located west of Williams Lake, BC. A formal letter of intent exists between Western Biomass (assumed now by ROR) and TNG and progress is being made towards finalizing the terms for a joint venture development of this project. It is expected that Western Biomass is likely to submit a bid in the separate Bioenergy Call for Power in 2008

## *Run of River Power Inc.* *(ROR-V,$0.41; TP: $1.25)*

## *Sector: Alternative Energies* (Sector Outperform)

## *Sub-sector: Run of River Hydro & Biomass*

CAPITAL MARKETS HAYWOOD SECURITIES INC.

### Company Overview

Run of River Power Inc. is an IPP and developer of run of river hydro projects with 194MW of development capacity secured from the rights to 13 run-of-river sites. ROR also recently bought the outstanding shares of Western Biomass, with plans to develop several biomass projects utilizing the large inventory of pine beetle killed trees. The first project is to be a 50MW to 100 MW plant near Williams Lake, B.C.

### Investment Brief

Energy demand in BC is forecast to grow at 25% to 45% in next 20 years
ROR's Brandywine Creek is currently operational (7.6MW)
Development of 161MW Upper Pitt River commenced in Feb/07
33MW Mamquam development project is focused on the BC Hydro Clean Power Call
BC Hydro to rely on IPPs to mitigate projected energy supply deficit
2007 BC Energy Plan mandates clean energy use, eliminate energy deficit by 2016

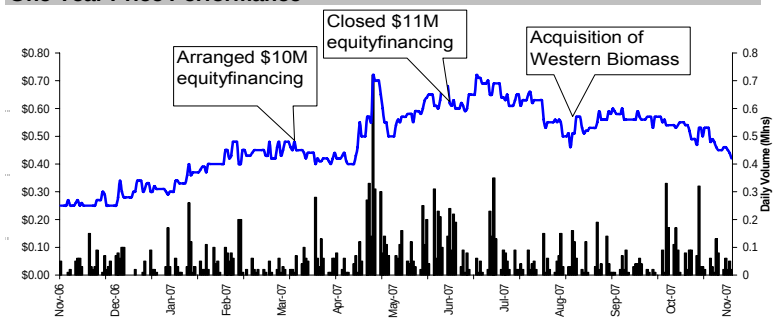
### Catalysts

H1 2008 – Submissions to the BC Hydro Clean Power Call
Q1 2008 – MOU with First Nations
H2 2008 – Implementation of the Standing Offer Program for <10MW projects
H2 2008 – Implementation of the Clean Power Call and awarding of contracts to IPPs
H2-2008 – Issuance of contracts (EPAs) to ROR for a stated number of MW
Mid-2008 – Amendment to the Pinecone Burke Provincial Park boundary
H2 2008 – Decision regarding Environmental Assessment Certficate
H2 2008 – Implementation of the Bioenergy Call
2008/09 – Secure project financing or JV agreements to advance development

### Risks

Opposition from local communities and First Nations may prevent permitting
Unanticipated negative environmental impacts preventing project advancement
Construction costs and development timelines may be higher and longer than anticipated, affecting profitability
ROR may not be able to secure favourable financing terms, if at all
Regulatory and subsidy changes may favour alternative energies over run-of-river
Poor hydrology over a given year may negatively impact profitability and capacity utilization

### One Year Price Performance




### Development Portfolio

**Operating Project:**

Brandywine Creek: 7.6MW capacity generating 40+ GWh per year (4,000 homes)
Revenue: $2M annually, offsetting over 12,000 tonnes of $CO_2$ annually

**Development Projects:**

Mamquam Project:
33MW of potential installed capacity 70km from Vancouver, Crawford Creek, Raffuse C and Skookum Creek; 17MW of potential installed capacity targeted to the SOP

Pitt River Projects:
Located between Whistler and Vancouver, adjacent to Mamquam
194MW of potential installed capacity targeted for Clean Power Call/SOP
Currently in active consultations with First Nations

Western Biomass:
50-100MW wood waste fire plant in conjunction with TNG First Nations

### Share Data

| | | | |
|---|---|---|---|
| **Current Price** | | | *$0.41* |
| **Market Cap.** (mm) | | | *25.4* |
| **52wk Hi / Lo** | *$0.73* | - | *$0.21* |
| **Shares O/S** (mm) | | | |
| Basic | | | *61.9* |
| F.D. | | | *101.5* |
| **Daily Volume (3-Mth. Avg. mm)** | | | *0.07* |
| **Options (2006 Fiscal Year-End)** | | | |
| Avg. Strike / Basic | *$0.57* | - | *$2.43* |
| **Warrants (2006 Fiscal Year-End)** | | | |
| Avg. Strike / Basic | *$0.50* | - | *N/A* |
| Dividend Yield | | | *N/A* |
| Short Interest | | | *N/A* |
| Short Interest % of Float | | | *nmf* |

### Financial Information

| | |
|---|---|
| **Revenue (ttm)** | *1.5* |
| Gross Margin (ttm) | *84.3%* |
| **Enterprise Value** (mm) | *27.1* |
| **Cash** (mm) | *5.5* |
| **Debt** (mm) | *12.3* |
| **Net Cash / Share** | *nmf* |
| **Tang. Book Value / Share** | *$0.33* |
| **Last Financing:** | |
| Equity Offering | *6/14/2007 for 27.5M @ $0.40* |
| Debt Offering | *N/A* |

### Company Info & Ownership:

| | |
|---|---|
| Company President & CEO | *Jako Krushnisky* |
| Company Website | *www.runofriverpower.com* |
| **Top Institutional Holders:** | |
| 1) Skyberry Holdings | *30.31%* |
| 2) Rockford Technology Corp. | *6.82%* |
| 3) Front Street Capital | *0.36%* |
| **Total Institutional Ownership:** | *39.39%* |
| **Ownership:** | |
| Management Control | *5.60 M* *9.05%* |
| | |
| Analyst Coverage: | 1 |
| Target Price: | *$1.45* |

### Project Valuation

| Project | Capacity (MW) | Price/MWh | Project Start Estimate | NAV (000's) | NAV/shr | Attrition adjustment | Total |
|---|---|---|---|---|---|---|---|
| Brandywine Creek | 7.6 | 57.16 | | 11.4 | 0.11 | 0% | 0.11 |
| **Uncontracted Projects** | | | | | | | |
| Raffuse Creek | 9.9 | 80.00 | 2009 | | | | |
| Crawford Creek | 7.0 | 80.00 | 2010 | | | | |
| Skookum Creek | 16.0 | 95.00 | 2014 | | | | |
| Bucklin Creek | 35.0 | 95.00 | 2010 | | | | |
| Pinecone Creek | 23.0 | 95.00 | 2010 | | | | |
| Shale Creek | 16.0 | 95.00 | 2011 | | | | |
| Steve Creek | 16.0 | 95.00 | 2011 | | | | |
| Corbold Creek | 15.0 | 95.00 | 2012 | | | | |
| ZZ Creek (East Corbold) | 15.0 | 95.00 | 2012 | | | | |
| Homer Creek | 15.0 | 95.00 | 2013 | | | | |
| Boise Creek | 26.0 | 95.00 | 2013 | | | | |
| Subtotal | 193.9 | | | 144.1 | 1.42 | 25% | 1.07 |
| **Other projects** | | | | | | | |
| Gott Creek/Dewdney Creek | 16 | 95.00 | 2016+ | 11.0 | 0.11 | 40% | 0.07 |
| **Total** | **217.50** | | | | | | **1.24** |

**Source: Haywood Securities Inc., Company Reports; Capital IQ, Bloomberg**



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# ROR BUSINESS OPERATIONS

Run of River Power Inc. (ROR), based in Delta, British Columbia (BC), is an independent power producer (IPP) currently operating the 7.6MW Brandywine Creek hydroelectric power generating station; developer of environmentally friendly and renewable clean power, run-of-river hydro in BC; as well as a bioenergy division focused on the use of trees destroyed by the pine beetle in BC. In its project development pipeline, the company has identified 13 potential run of river project sites with a total capacity of 210MW (enough to supply an estimated 90,000 homes) and at least one biomass site with a proposed capacity of between 50 MW and 100MW for a total of 310 MW of potential annual electricity supply.

The parent company, Run of River Power Inc. operates as a number of standalone subsidiaries:

- 1554675 (inactive)
- Rockford Energy Corporation (incorporated Mar1 /00)
- Jascott Holdings Corp. (incorporated Jan 19/00)
- Raffuse Energy Inc. (incorporated Nov/05)
- Northwest Cascade Power (incorporated in 2001; arrangement made with Ledcor Power Inc. in Q4/05 to acquire 100% of Northwest, which holds the water license for seven projects in eight creeks – The Upper Pitt River Power Cluster)
- Crawford Energy Corp. (incorporated Feb/06)
- Skookum Energy Corp. (incorporated Feb/06)

This corporate structure is designed and intended to facilitate project and debt financing of the projects in development – projects and associated debt/equity for project financing are held within each subsidiary and further mitigate risk in expediting the due diligence process for lenders.

## *Brandywine Creek*

Brandywine Creek flows into the Cheakamus River approximately 15 km north of Whistler, BC, where the watershed is fed by a combination of glacial melt runoff, rain and snow melt. The project itself consists of a 3m high concrete weir diversion at an 822m elevation, that is fed into a 4.5km long penstock and falls 282m (head) to the powerhouse housing two turbines. The Brandywine project is rated a 7.6MW 'Ecologo' ceritified power plant, capable of producing an estimated 38,000 to 42,000 MWh of electricity annually – a potential offset of 13,000 to 15,000 tonnes of green house gas emissions annually (the equivalent of that produced by a conventional coal or oil plant at the same energy output).

ROR was awarded an EPA by BC Hydro for Brandywine Creek project in response to the 2000/01 Call for Green Energy Projects, following which the plant became operational in May 2005. As such, electricity produced at Brandywine was sold to BC Hydro under the 20-year EPA contract, within three years of the original contract award. Under the terms of the contract BC Hydro agreed to purchase all output from the Brandywine project operated by Rockford Energy (a ROR subsidiary) at the rate of $55/MW, annually adjusted for inflation (growth at one-half of annual CPI). We note that the Call for Power in 2000/01 issued long term contracts at prices pre-set by BC Hydro prior to the Call application process. Unlike the open bid process today, the

pricing set in the 2000/01 Call for Power was prohibitive to the economic viability of a number of projects and so some of the projects have never been constructed.

The project generates annual expected gross revenue of up to $2.1M (assuming 38,000MWh sold at the current $57.16/MWh price) and approximatley $1.7M in EBITDA (~78% margin) for the duration of the EPA, or approximately $50M in gross revenue to ROR over the 20 year life of the EPA. There is sesonality in the generation of run-of-river hydro power, as weather conditions dictate the amount of water and strength of flow through the penstock and power stations. We generally expect the second and third quarter of the calendar year (April through September) to result in optimum generation at the power station, followed by Q4 and Q1. This peak period for run-of-river hydro generators is similar timing to peak loads generated by BC Hydro with its large hydro projects (the freshet period), however there is still demand for intermittent supply by BC Hydro during these periods. Pricing in the 2000/01 Call for Power was fixed, regardless of when supply was generated. However, we note that under the terms of newer EPA contracts with price adjustments for supply during heavy and light load periods, the payments from BC Hydro during the freshet is the lowest for the year.

Figure 11: Run of River's Brandywine Creek Project

Brandywine Creek Intake

Powerhouse Brandywine Creek

Generators in the Powerhouse at Brandywine Creek

Penstock at Brandywine Creek

Source: Run of River Power

Total construction costs for this project amounted to $16 million with $15.2 million in construction financing provided by Ledcor Design Build and about $13 million of debt financing secured through Industrial Alliance Insurance and Financial Services Inc. and CCG Trust (an Industrial Alliance affiliate). The Brandywine Creek Project was built by Ledcor Industrial Ltd (which took less than a year to build) in consultation with the Lil'wat and Squamish First Nations communities. Ledcor's interim financing was a fixed price contract provided at a cost of prime plus 2.2% and included the design, construction and engineering of the Brandywine project. In return Ledcor retained net revenue (recorded against the project costs), incurred operating costs, and maintained the project from May 2005 when the generators were installed until the construction financing was paid out in full in August 2005.at August 2005, 100% ownership of the project was handed over to ROR (Rockford).

## First Nations Agreements & Royalties

In June 2005, ROR issued 100,000 shares to two First Nations communities (Squamish and Lil'Wat) in whose territory the Brandywine project is located. ROR also has a commitment to pay a 1% royalty (starting from the commercial operation date when the project's electricity production ranges between 0 to 40.5 GWh) for the first 15 years of operation; on the sixteenth year of operation this royalty increases to 1.5% in perpetutity. If production ever exceeds 40.5GWh annually, ROR must pay the First Nations community a royalty of 5% on the production in excess of 40.5GWh.

Roughly $4 million was invested in the Squamish First Nation's community during the construction period of Brandywine, providing jobs and training to local community members and most importantly boosting the local economy with a long-term stream of revenue.

## Lessons Learned Following a Setback at Brandywine

During routine testing at Brandywine, it was discovered that a bacteria, indigenous to local streams was damaging the intake pipes of the project. The corrosive, iron reducing bacteria was collecting inside of the steel portion of penstock at Brandywine causing a reduction in achievable power output during the first year of operation (2006). The bacteria was causing a reduction of water volume flowing through the penstock, increasing friction as the water passed through the system thus negatively impacting water velocity. This affected a significant portion of the lower portion of the penstock pipe (about 2,500m of the steel penstock) which is connected to the powerhouse. It was determined that the only way to correct the problem was to clean the inside of the penstock with high pressured water jets and then coat the pipe with corrosion resistant paint. This correction required a 35 day shutdown of Brandywine from Oct. 31 to Dec. 5 and cost just over $1 million (some costs were capitalized), further impacting 2006 production (resulting in a 74.4% y/y decrease in revenue to $119,885 in Q4/06). However, the result following the correction were much improved with an 8% increase over the previous maximum output achievable (7.62MW production recorded in March, 2007) and a capacity increase of approximately 0.5 to 1MW (previous capacity was 6.65MW).

Figure 12: Run of River's Brandywine Creek and Development Project Portfolio


Source: Company reports

### *ROR's Development Project Portfolio*

ROR has 11 projects under development, totaling 194MW of capacity that could potentially generate over 670GWh of renewable, green power annually. The projects are situated in two location clusters known as the Upper Pitt River Power Cluster and the Mamquam Power Cluster.

### *Upper Pitt River Power Cluster*

ROR acquired a license to this power cluster from Ledcor Power in November 2005. The Upper Pitt River Power Cluster is a series of 7 proposed sites on 8 streams that are tributaries to the Upper Pitt River.

- Boise Creek – Production of approximately 83GWh of green energy per year is expected. The project would consist of an intake at 353m which feeds a 2,663m penstock, with 169m of head delivering enough water pressure to drive a 26MW plant capacity;
- Bucklin Creek – Production of approximately 119GWh of green energy per year is expected. The project would consist of an intake at 733m which feeds a 4,116m penstock with 571m of head delivering enough water pressure to drive a 35MW plant capacity;
- Corbold and ZZ (East Corbold) Creeks - Production of approximately 119GWh of green energy per year is expected. The project would consist of an intake at 282m and 660m

which feed a 3,049m penstock with 215m and 593m of head delivering enough water pressure to drive two 15MW plant capacity;

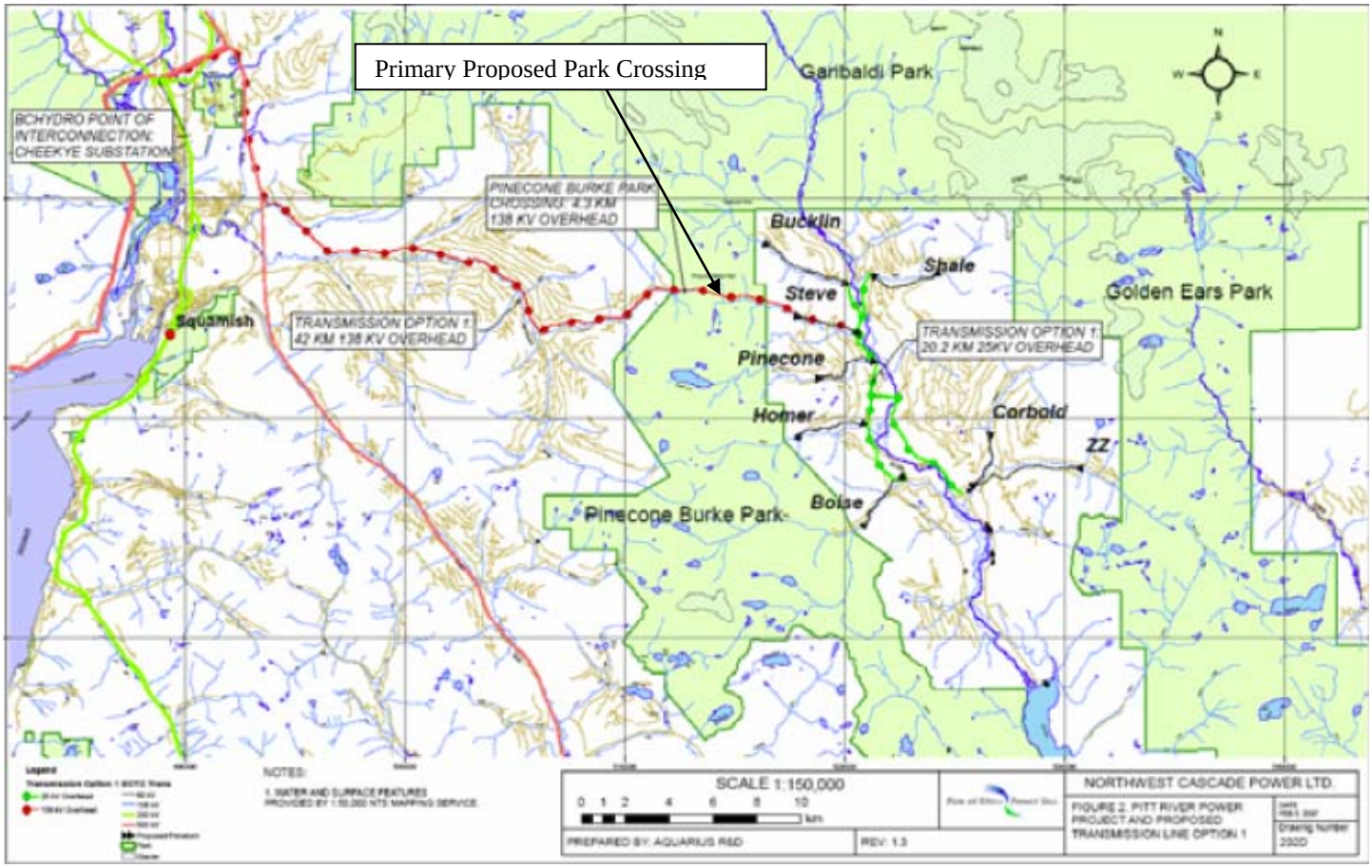
- Homer Creek – Production of approximately 48GWh of green energy per year is expected. The project would consist of an intake at 670m which feeds a 3,580m of penstock, with 620m of head delivering enough water pressure to drive a 15MW plant capacity;
- Pinecone Creek – Production of approximately 82GWh of green energy per year is expected. The project would consist of an intake at 785m which feeds a 3,185m penstock, with 598m of head delivering enough water pressure to drive a 23 MW plant capacity;
- Shale Creek – Production of approximately 55.9GWh of green energy per year is expected The project would consist of an intake at 844m which feeds a 3,925m penstock, with 604m of head delivering enough water pressure to drive a 15 MW plant capacity;
- Steve Creek – Production of approximately 49GWh of green energy per year is expected. The project would consist of an intake at 1010m which feeds a 3,390m penstock, with 850m of head delivering enough water pressure to drive a 16 MW plant capacity.

The project is located 35 km north of Pitt Meadows, 40km east of Squamish and approximately 70 km north of Coquitlam, BC. In total, the Pitt River Power Cluster is estimated to have a capacity generation of 161MW, or enough energy to supply over 55,000 homes each year. The plans for the project call for development of land that lies primarily within the traditional territory of the Katzie First Nation community. In addition, a new transmission line is required for the project which would also extend into the Squamish Nation territory with which ROR has had prior successful negotiations.

Hydrology data and field studies conducted for the project have determined that one powerhouse can be shared between two of the streams from this power cluster (Corbold and East Corbold Creeks), resulting in reduced capital costs and potentially increasing the competitive position of this project's bid in the upcoming Clean Power Call.

The proposal is to connect these seven projects by 25kV and 69kV feeder lines to a 230kV substation built adjacent to a powerhouse at Steve Creek. A transmission line would run thorugh Steve Creek to Crawford Creek where the Mamquam power cluster projects (Raffuse, Crawford and Skookum) would also connect with the powerline. The powerline would continue down the Mamquam River to an existing BC Hydro right of way into the Cheekeye substation near Squamish, BC.

Figure 13: The Upper Pitt River Power Project Arrangment Maps




Source: EAO website

Project construction is expected to require approximately $330M capital investment and with construction anticipated to occur sequentially from 2009 through 2015. We note that it is possible ROR will seek a partner for the development of these projects. The 42 km of transmission line is of key significance and perhaps likely to come under most scrutiny in the permitting process. The proposed route for the new transmission line will have an approximately 3.4km section of it crossing Pinecone Burke Provincial Park. This means that a park boundary amendment and legislation is required before building can begin. Opposition to the transmission line in the park centres around the notion that it would impact animal movement (resident mountain goat and grizzly bears) and their access to feeding areas, in addition to fears that other parks in the province would then have precedent for industrial uses. As the most efficient and economic route for the transmission line, ROR has proposed a rather creative resolution to this problem. ROR has proposed that the required utility poles be installed via helicopter to minimize the environmental impacts to the Park land and avoid having to build and maintain a service road into the location. In addition, the company is working to provide land adjacent to the Park, which is a natural habitat for local species, as designated green space, in lieu of the land being used in the Park crossing. ROR intends to compensate parties with an economic interest in this particular land to retain it as green space and include it in the Park boundaries. We note that there is legislation providing for the change requested by ROR. The 2004 Provincial Park Boundary Adjustment Policy allows for the severing of land from provincial parks if it is deemed to be in the public interest. However, the decision rests entirely with the legislature, as well as local First Nations

who would likely have an influence on any eventual outcome. We would expect a decision from the legislature late H1 2008, presenting a key binary catalyst for ROR (provided the projects are awarded EPA's).

## Additional Permitting & Royalties

ROR wholly owned subsidiary, Northwest Cascade Power, received confirmation on February 19 2007 from the Environmental Assessment Office acknowledging the Upper Pitt River project portfolio of seven proposed power generation facilities was accepted for governmental review under the British Columbia Environmental Assessment Act (BCEAA). This allowed for the formal review process to commence – a process which has fixed timelines:

- Application screening stage (max. 30 days)
- Application review and assessment (max. 180 days)
- Ministers' decision on an environmental assessment certificate (max. 45 days)

The application review stage is estimated to have begun in August 2007 with the aim of obtaining an environmental assessment certificate by the spring of 2008. The Upper Pitt projects are expected to have low environmental impacts and are to be certified as 'green' power projects under the Environment Canada Ecologo brand – that is outside of the Park crossing adjustment. Only the Boise Creek project has been determined to have fish present at the intake location and throughout the diversion reach and therefore the intake weir and related work at Boise will require authorization under the Federal Fisheries Act.

It would be expected that a royalty structurewith First Nations similar to that in place under the Brandywine Creek project would be negotiated for all other projects that move through to development and production. We have thus modeled a royalty of about 0.5% of gross revenue per First Nation's community in the first 15 years of a twenty year contract increasing thereafter for all development projects in ROR's pipeline.

Table 15: The Upper Pitt River Power Preliminary Hydrology

| Stream | Penstock (m) | Head (m) | Intake MAD (m3/s) | Design Q (m3/s) | Capacity (MW) | Energy (MWh/yr) | Implied Utilization Rate | Drainage Area (approx sq.km) | Annual Revenue @ $80/MWh |
|---|---|---|---|---|---|---|---|---|---|
| Bucklin | 4,524 | 593 | 4.3 | 8.0 | 35 | 119,000 | 39% | 31.5 | 9,520,000 |
| Steve | 3,300 | 900 | 1.2 | 2.5 | 16 | 49,000 | 35% | 11.4 | 3,920,000 |
| Pinecone | 3,632 | 685 | 2.6 | 4.5 | 23 | 82,000 | 41% | 21.9 | 6,560,000 |
| Homer | 3,678 | 680 | 1.6 | 3.0 | 15 | 48,000 | 37% | 14.5 | 3,840,000 |
| Boise | 3,368 | 292 | 7.7 | 12.2 | 26 | 83,000 | 36% | 57.7 | 6,640,000 |
| Shale | 3,558 | 604 | 1.9 | 3.6 | 16 | 55,000 | 39% | 15.3 | 4,400,000 |
| Corbold* | 3,055 | 215 | 6.4 | 9.4 | 15 | 61,000 | 46% | 89.9 | 4,880,000 |
| E.Corbold* | 5,682 | 593 | 2.2 | 3.4 | 15 | 57,000 | 43% | 89.9 | 4,560,000 |
| **Total** | **30,797** | **4,562** | **27.9** | **46.6** | **161** | **554,000** | **39%** | **332.1** | **44,320,000** |

Note: *The drainage area for Corbold Creek and E.Corbold Creek is a combined 89.9 sq.km because the project design calls for the two creeks to share.

Source: Company reports; Haywood Securities

Figure 14: The Upper Pitt River Power Cluster General Arrangement


Source: Company Reports

We assume a capital cost expense of $2.3/MW given the complexity of the design and construction for the project and incorporate a long term operating expense costs of 20%. The critical risks to this project are at first driven by attaining the allowance for the Park crossing with a new transmission line. Should this allowance not be made, ROR would have to go back to the drawing board and revisit alternatives for the path of the transmission line, potentially deferring the submission of applications in the Clean Power Call next year.

## *Mamquam Power Cluster*

The Mamquam Power Cluster is comprised of three development projects located in the Upper Mamquam watershed found approximately 70km from Vancouver and again within the Squamish First Nation territory with whom ROR has had previous successful negotiations.

- Crawford Creek - a tributary to the Mamquam River located directly adjacent to Raffuse Creek and 19 km from the Squamish substation. The project is located in the Coast Mountain range and falls within a temperate rainforest geoclimatic zone. Production of approximately 30GWh of green energy per year is expected. The project consists of an intake at 755m which feeds a 5,100m penstock, with 240m of head delivering enough water pressure to drive a 7.0 MW plant capacity;

- Raffuse Creek - a tributary to the Mamquam River located approximately 9km east of Squamish, BC. The project is located in the Coast Mountain range and is in a temperate rainforest, geo-climatic zone. Production of approximately 36.5GWh of green energy per year is expected. The project consists of an intake at 310m which feeds a 4,445m penstock, with 290m of head delivering enough water pressure to drive a 9.9 MW plant capacity; and

- Skookum Creek - a tributary to the Mamquam River located approximately 4km east of Raffuse Creek and 13km from Squamish, BC. The project is located in the Coast Mountain range and is in a temperate rainforest, geoclimatic zone. Production of approximately 70GWh of green energy per year is expected. The project consists of an intake at 820m which feeds a 6,400m penstock, with 300m of head delivering enough water pressure to drive a 16.0 MW plant capacity.

Together the projects have a proposed design capacity of 33MW (electricity to power 15,300 homes annually) able to produce a collective 153GWh of electricity that is also expected to be bid into the Clean Power Call. We expect that two of the three projects will be submitted to the Open Call or Standing Offer Call aimed at projects of up to 10 MW. Additionally ROR may be able to share existing transmission infrasture with Canadian Hydro Developers' nearby (KHD-T) 25MW Upper Mamquam project, potentially allowing for cost reductions and therefore an improved competitive position in the Call for Power this year.

Crawford Creek is expected to be developed by Crawfod Energy after Skookum, or in tandem. However the company recognizes that Raffuse, Skookum and Crawford could be developed simultaneously, potentially allowing for the realization of efficiencies and savings during the licensing and permitting stages. Additionally, the water licensing review process, along with the BC Hydro RFP submissions could then prove to be more efficient in terms of timing and associated costs. A pre-build of a portion of the P.H. Cheekey transmission line is a possible interconnection site for this project.

It should be noted that the 10MW Raffuse project was previously bid into the 2006 Call for Power but was not awarded an EPA by BC Hydro at the time. After much investigation by ROR, it became apparent that the application was not accepted on the basis of ROR's plan to tie the project's electricity output into the KHD transmission line (69kV). KHD had agreed to the connection by ROR, however the line capacity was much larger than what was required by ROR. Ultimately BC Hydro's determination of the associated costs of connecting to the KHD transmission line prevented the bid from being competitive relative to other submissions in the Call for Power. Two things have changed the competitive positioning of Raffuse's bid into the upcoming call: 1) the implementation of the Standing Offer Program for smaller projects in the Clean Power Call and 2) ROR has investigated the optimal design of a transmission line for the project and now plans to string 25kV lines underneath KHD's transmission 69 kV lines but using

the same poles. This approach avoids the previous issue altogether and further addresses any potential opposition regarding visual impacts to the area through the use of existing infrastructure. Lastly, a development plan is currently underway to capture and realize economies of scale resulting from the close proximity of the Mamquam Power Cluster and Pitt River Power Cluster projects to each other and the power grid.

Table 16: Mamquam Power Cluster Project Preliminary Hydrology

| Stream | Penstock (m) | Head (m) | Design Q (m3/s) | Capacity (MW) | Energy (MWh/yr) | Implied Utilization Rate | Drainage Area (approx sq.km) | Revenue @ $79/MWh + |
|---|---|---|---|---|---|---|---|---|
| Raffuse | 4,445 | 290 | 4.0 | 10 | 36,000 | 41% | 26.0 | 2,953,800 |
| Crawford | 5,100 | 240 | 4.1 | 7 | 31,000 | 51% | 23.0 | 2,543,550 |
| Skookum* | 6,400 | 300 | 3.8 | 16 | 86,000 | 61% | 53.0 | 7,230,949 |
| **Total** | **15,945** | **830** | **11.9** | **33** | **153,000** | **53%** | **102.0** | **12,728,299** |

Note: SOP is proposed at $79/MWh adjusted for location and an additional $3.05/MWh for green credits
*Skookum revenue based on assumed price of $84.08 in 2014 per ROR
Source: Company reports; Haywood Securities

We assume a capital cost of approximately $2.3/MW given the complexity of the project and operating costs of 20%. The critical risks to this project are also first driven by attaining the allowance for the Park crossing with a new transmission line. Should this allowance not be made, ROR would have to go back to the drawing board and revisit alternatives for the path of the transmission line, potentially deferring the submission of applications in the Clean Power Call next year.

### *Future Developments*

ROR also has two projects slated for future development, the Gott Creek and Dewdney Creek projects with a combined design capacity of an additional 16MW able to produce 81GWh of electricity. The Gott Creek project is slated to power the Cayoosh Creek ski development 7km away in Melville Creek. The Dewdney Creek project is expected to be interconnected to BC Hydro's 25kV feeder 200m from the proposed powerhouse sight. We do not expect these projects to be submitted to the Clean Power Call. There is however, expectations of a 2009 Call for Power and it is possible these projects would be further along in the development process such that they would be appropriate submissions at that time and contribute to longer term value for ROR. Below are preliminary hydrology, power and revenue summaries of each.

Table 17: Gott and Dewdney Creek Preliminary Hydrology

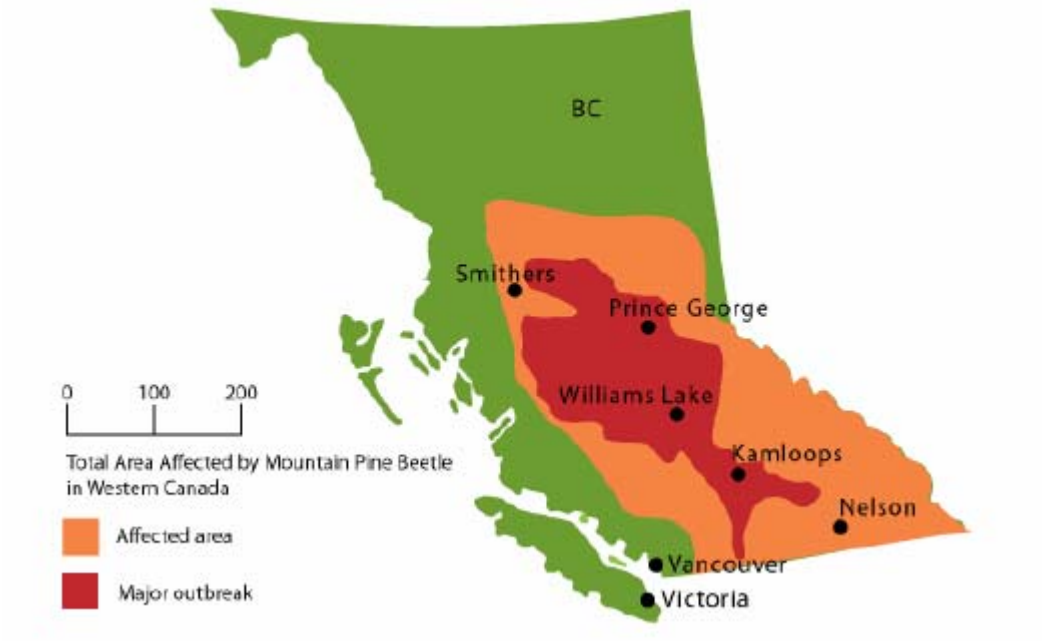
| Stream | Penstock (m) | Head (m) | Design Q (m3/s) | Capacity (MW) | Energy (MWh/yr) | Implied Utilization Rate | Drainage Area (approx sq.km) | Revenue @ $82/MWh + |
|---|---|---|---|---|---|---|---|---|
| Gott | 3,200 | 340 | 4.8 | 10 | 53,000 | 61% | 53.0 | 4,346,000 |
| Dewdney | 6,100 | 250 | 3.6 | 6 | 28,000 | 53% | 65.0 | 2,296,000 |
| **Total** | **9,300** | **590** | **8.4** | **16** | **81,000** | **58%** | **118.0** | **6,642,000** |

Source: Company reports; Haywood Securities

### *Western Biomass*

In August 2007, ROR reached an agreement to acquire Western Biomass Power Corp. (Western Biomass), a private company originally formed to provide clean electricity in BC and to provide a use for the biomass inventory created by the mountain pine beetle epidemic in the BC interior. Western Biomass has developed plans to build a series of wood-fired plants (traditional combustion plants) using the trees destroyed by the pine beetle, as well as logging and mill wastes as feedstock.

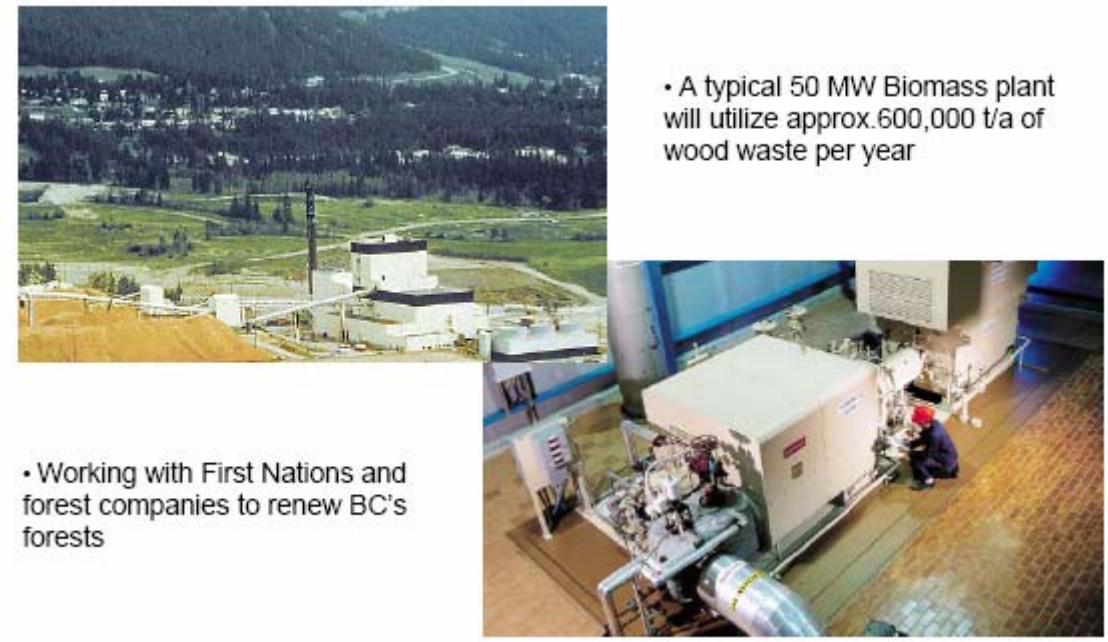
Figure 15: Pine Beetle Affected Areas in BC




Source: Company Reports

The first of Western Biomass' projects is expected to be a 50 to 100MW plant located in the traditional territories of the First Nations (Tsilhqot'in National Government – TNG). Western Biomass has entered into a letter of intent with the TNG and is finalizing a partnership agreement to advance the project to the feasibility stage.

Figure 16: Pine Beetle Affected Areas in BC




Source: Company Reports

A separate call for biomass generated power (Bioenergy Call) is expected to be designed in 2008 with Western Biomass targeting a submission for a long term EPA. Draft term sheets for the design of the Bioenergy Call are expected to be released before year end. The regulatory process is expected to begin March 2008, with the formal issue of the Call in the spring of 2008. Bioenergy EPA contract awards are expected in the fall of 2008.

We have not factored any of Western Biomass' projects into our valuation until there is further clarity into the feasibility of any of its projects and until the economic viability of a sustainable wood-fired biomass plant can be demonstrated. However, this remains a key value driver for the company as the targeted project advances through the development process.

ROR purchased the assets of Western Biomass in a 3.8 million share swap valued at just under $2.5 million. About 67% of the shares release from under escrow as key milestone targets are met. We note that CFO of ROR, Michael Sweatman, was a 17.4% shareholder and Director Rick Hopp was a 6.2% shareholder of the private company prior to the acquisition of its shares

## *An Acquisition Candidate*

We expect that ROR could reasonably be an acquisition target for a number of utility, oil and gas, pipeline, mining and other renewable energy companies. With increased focus on greenhouse gas and other air emissions by federal governments around the world, ROR's portfolio of renewable projects with zero emissions could be viewed as an attractive target. We expect that as levies are mandated by federal governments for those not complying with reduction targets, green/environmental credits are likely to become a very valuable currency.

# FINANCIALS

## *Operating Project Valuation*

ROR has been accruing revenues from its Brandywine Creek project since August 2005. However, the project did not operate at optimum capacity until 2007 because of a bacteria problem within the steel portion of the penstock. Through 2007 the project has been operating well ahead of projected capacity of about 40% or 38GWh per year. In estimating revenue projections for ROR, we have currently only include the Brandywine Creek project as it has been awarded a 20-year EPA contract from BC Hydro. While we believe that ROR will be awarded additional contracts in the Clean Power Call and Standing Offer Program, we believe it is too early in the development of these projects to begin accruing revenue streams for them.

Our valuation projections are based on the following assumptions:

- Brandywine Creek is operating at a capacity of 7.6MW, producing about 40GWh per year of power;
- Run-of-river projects have an estimated life of 50 years (following this replacements and refurbishments would normally be required)
- We use current price per megawatt hour of $57.16, growing at one-half of CPI annually over the 20-year term of the contract, we assume that an EPA is recontracted for the remaining 30 year life of the project at $85 per MWh (growing at one-half of CPI annually)
- We include tax deductions after another ~10 years of operations
- Operating costs for the project are estimated at about 20% of total revenues, including the royalty rate paid to First Nations and project oprerating expenses such as insurance, maintenance, property taxes, water rental rates etc.
- We use a 10% discount to equity and a fully diluted share count of 101.5 million shares to determine an asset value

## *Development Project Valuations*

To determine the remaining asset value of ROR, we and conducted a discounted cash flow analysis, we looked at the potential revenue flows and costs for each project in ROR's development portfolio. The valuation assumptions we used were as follows:

- Projects to be entered into the Standing Offer Program include the Raffuse Creek and Crawford Creek projects with a capacity of 9.9MW and 7MW respectively;
- 177MW of projects will be entered into the Clean Power Call;
- Operation dates range from 2009 thorugh 2014;
- For each project in the Clean Power Call, we estimate an average price paid by BC Hydro of $95/MWh (prices growing at 0.5*annual CPI); we believe these prices are conservative given expectations for bid pricing in the Clean Power Call;
- For projects to be entered into the Standing Offer Program, we estimate an average price paid by BC Hydro of $80/MWh (prices growing at 0.5*annual CPI);

- We do not assume that any projects qualify for the federal ecoEnergy incentive of an extra $10/MWh, though it is likely that some of the projects being entered into the Clean Power Call could be eligible;
- We assume EPA contracts of 30-year terms and project life of 50 year terms;
- We assume capital costs per megawatt hour of $2-3 million on average;
- Operating costs are assumed to be 20% of revenues;
- Debt financing for projects is generally assumed to be 80/20 debt to equity at a cost of debt of 6-6.5%, paid over the life of the EPA contracts;

  The total cost of financing all remaining projects in ROR's portfolio is estimated at about $400 million;
- We assume debt maturity dates are matched to the end of EPA contracts;
- We use a discount to equity rate of 10%;
- We also assume a project attrition rate of between 15% and 40% for projects in the development pipeline, similar to the results of previous BC Hydro Calls for Power.

Project values under these assumptions are shown in Table XX below.

Table 18: Project Valuations

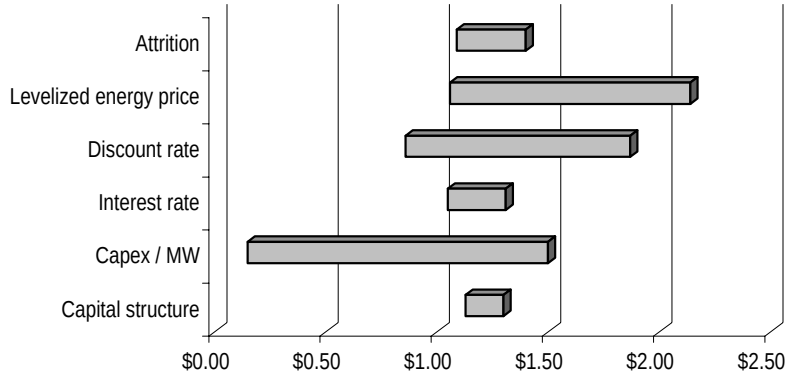
| Project | Capacity (MW) | Cost/MW ($M) | Price/MWh | Project Start Estimate | NAV (000's) | NAV/shr | Attrition adjustment | Total |
|---|---|---|---|---|---|---|---|---|
| Brandywine Creek | 7.6 | | 57.16 | | 11.4 | 0.11 | 0% | 0.11 |
| **Uncontracted Projects** | | | | | | | | |
| Raffuse Creek | 9.9 | 2.3 | 80.00 | 2009 | | | | |
| Crawford Creek | 7.0 | 2.3 | 80.00 | 2010 | | | | |
| Skookum Creek | 16.0 | 2.3 | 95.00 | 2014 | | | | |
| Bucklin Creek | 35.0 | 2.3 | 95.00 | 2010 | | | | |
| Pinecone Creek | 23.0 | 2.3 | 95.00 | 2010 | | | | |
| Shale Creek | 16.0 | 2.3 | 95.00 | 2011 | | | | |
| Steve Creek | 16.0 | 2.3 | 95.00 | 2011 | | | | |
| Corbold Creek | 15.0 | 2.3 | 95.00 | 2012 | | | | |
| ZZ Creek (East Corbold) | 15.0 | 2.3 | 95.00 | 2012 | | | | |
| Homer Creek | 15.0 | 2.3 | 95.00 | 2013 | | | | |
| Boise Creek | 26.0 | 2.3 | 95.00 | 2013 | | | | |
| Subtotal | 193.9 | | | | 144.1 | 1.42 | 25% | 1.07 |
| **Other projects** | | | | | | | | |
| Gott Creek/Dewdney Creek | 16 | 3.0 | 95.00 | 2016+ | 11.0 | 0.11 | 40% | 0.07 |
| **Total** | **217.50** | | | | | | | **$1.24** |

Source: Company reports and Haywood estimates

## *Valuation and Target Price*

We are initiating coverage of Run of River Power (ROR-V) with a target price of $1.25 per share, and a Sector Outperform rating. The sensitivity of ROR's valuation to discount rate, capital structure, levelized energy price, interest rate and capital costs is significant. The potential range of impacts to our current assumptions is shown in Table 19.

Table 19: Discounted Cash Flow Sensitivity Ranges

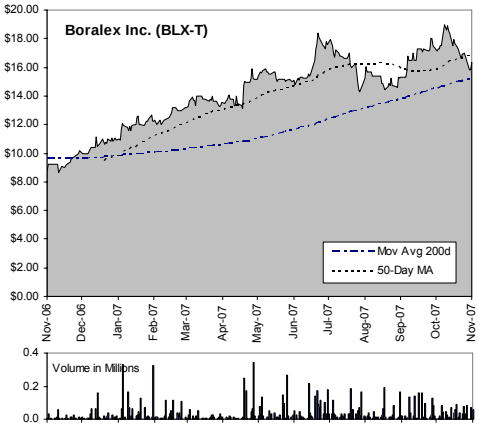


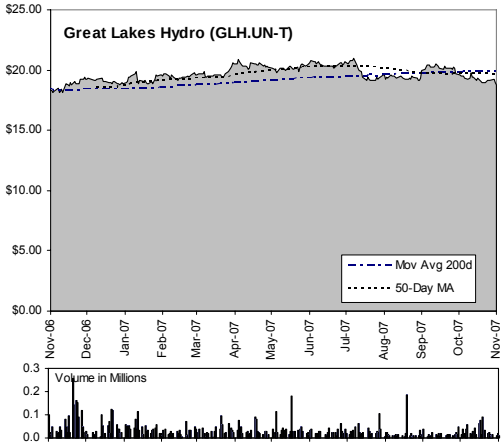

Source: Company reports and Haywood estimates

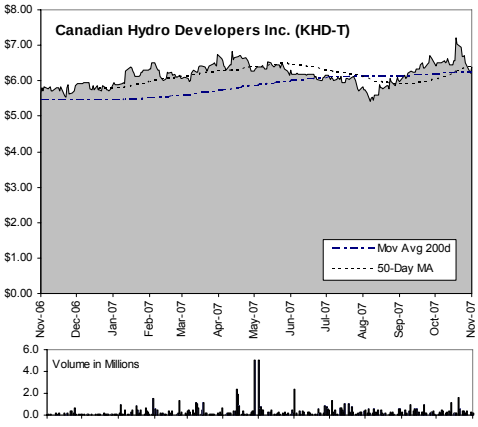
| | Low | High |
|---|---|---|
| Capital structure | 60% | 90% |
| Capex / MW | 3.5 | 2.0 |
| Interest rate | 7.5% | 5.5% |
| Discount rate | 12% | 8% |
| Levelized energy price | 90 | 120 |
| Attrition | +10% | -10% |

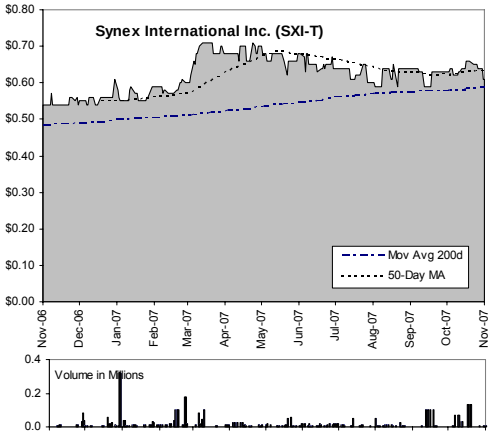
# PEER WATCH LIST

- Boralex Inc. (BLX-T)
- Canadian Hydro Developer Inc. (KHD-T)
- Great Lakes Hydro Income Fund (GLH.UN-T)
- Innergex Inc. (XX-T)
- Synex Inc. (SXI-T)



# INVESTMENT HIGHLIGHTS – BORALEX INC. (BLX–T)

Boralex (BLX) is a Canadian-based independent power producer operating hydroelectric, wood-residue (biomass), natural gas-fired and wind energy power plants. It's primary shareholders are Cascades (CAS-T) with 34% and the Kernaghan family with 14%. The company's combined installed capacity is roughly 350MW which generated about $120 million in revenue in 2006. BLX is targeting the development of new power station projects in order to maintain its profitable growth strategy despite being present in the merchant driven US market; Boralex intends to increase its exposure to and profit from long-term power purchase agreements (PPAs) in Ontario and France

BLX also manages 10 power stations for the Boralex Power Income Fund (BLX.UN), in which it holds a 23% interest. These power stations have a total capacity of 190MW, consisting of one thermal power station, one wood-residue cogeneration plant in Québec, seven hydroelectric power stations in Québec (5) and the United States (2), and a natural gas cogeneration power station in Québec.

### *Current Assets:*

- The largest wood-residue energy producer in North America (six thermal power stations in Maine and New York with capacity of 204MW)
- 14MW of natural gas cogeneration power in France
- 26MW installed capacity of hydroelectric power
- 103MW of installed capacity of wind power

### *Development Pipeline:*

- 5-year growth target is to have 1000 MW of installed capacity (from current 350MW)
- Anticipates tripling its wind energy installed capacity in France
- 90MW of near-term wind in Windsor, Ontario (30MW in 2008 and 60MW in 2009) expected to contribute ~$26M in incremental revenues and $21M in EBITDA
- Management track record of successfully executing on growth objectives (from 50MW in 1995 to 350MW today)

We monitor the development of BLX as an owner and operator of a portfolio of run-of-river hydroelectric plants (8 owned, 7 managed for Boralex Power Income Fund) and in consideration of management's goal of expanding and diversifying its asset base by geography and energy type. Wind will also likley be the largest contributor to BLX growth going forward, in our opinion, due to the scale of projects under development. Additionally, BLX had recently acquired a 50% interest in Spanish development company Compania Electrosolar Onubensa S.L. (CESOn) giving it exposure to solar technology and energy developments estimated at 25MW to 100MW over the next five years.

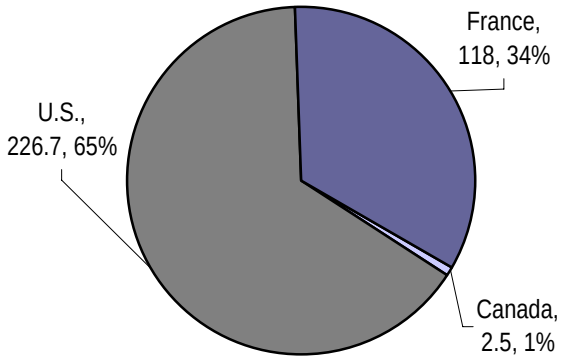
Table 20: BLX Operating Projects

| Facility | Location | Type | Net Capacity (MW) | Generation (GWh) | Counter Party/ Power Purchaser | Duration of PPA | Approx. Years Remaining |
|---|---|---|---|---|---|---|---|
| East Angus | Quebec | Hydro | 2.2 | 15.0 | Hydro-Quebec | 2013 | 6 |
| Huntingville | Quebec | Hydro | 0.3 | 1.0 | Hydro-Quebec | 2016 | 9 |
| La Rochette | France | Hydro | 1.0 | 3.0 | Electricite de France | 2014 | 7 |
| Fourth Branch | New York | Hydro | 3.1 | 14.0 | Open Market (NYISO) | N/A | N/A |
| Middle Falls | New York | Hydro | 2.3 | 10.2 | NIMO | 2028 | 21 |
| NY State Dam | New York | Hydro | 11.4 | 48.4 | Open Market (NYISO) | N/A | N/A |
| Sissonville | New York | Hydro | 3.0 | 13.3 | Open Market (NYISO) | N/A | N/A |
| Warrensburg | New York | Hydro | 2.9 | 10.9 | Open Market (NYISO) | N/A | N/A |
| Chateauguay | New York | Biomass | 20.0 | 140.0 | Open Market (NYISO) | N/A | N/A |
| Ashland | Maine | Biomass | 40.0 | 252.0 | WPS Energy | N/A | N/A |
| Fort Fairfield | Maine | Biomass | 36.0 | 240.0 | WPS Energy | N/A | N/A |
| Livermore Falls | Maine | Biomass | 40.0 | 252.0 | Open Market (ISONE) | N/A | N/A |
| Stratton | Maine | Biomass | 50.0 | 370.0 | Open Market (ISONE) | N/A | N/A |
| Stacyville | Maine | Biomass | 18.0 | 125.0 | Temporarily Closed | N/A | N/A |
| Avignonet-Lauragais | France | Wind | 8.0 | 20.0 | Electricite de France | 2017 | 10 |
| Chepy | France | Wind | 4.0 | 7.1 | Electricite de France | 2019 | 12 |
| Nibas | France | Wind | 12.0 | 21.4 | Electricite de France | 2019 | 12 |
| Ally-Mercouer | France | Wind | 39.0 | 78.0 | Electricite de France | 2020 | 13 |
| Cham de Cham Longe | France | Wind | 18.0 | 58.0 | Electricite de France | 2020 | 13 |
| Plouguin | France | Wind | 8.0 | 21.0 | Electricite de France | 2020 | 13 |
| St-Agreve | France | Wind | 14.0 | N/A | Electricite de France | 2022 | 15 |
| Blendecques | France | Natural gas | 14.0 | 82.0 | Electricite de France | 2019 | 12 |
| | **23** | | **347.2** | **1,782.3** | | | **12** |

Source: Company reports

## *Geographic Diversification*

Figure 17: Current Capacity by Location (MW)

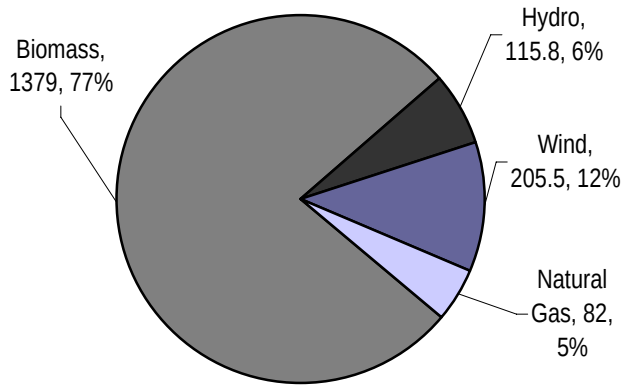



Source: Company reports

BLX's asset base is diversified geographically with decreasing sensitivity to regional hydrology or suboptimal wind conditions going forward. Among others, BLX intends to benefit from B.C. hydro development opportunities as part of its overall growth strategy in acquiring rights from local developers or greenfield operations. Its main growth in capacity going forward will be from wind developments with contributions from solar opportunities in the medium-term.

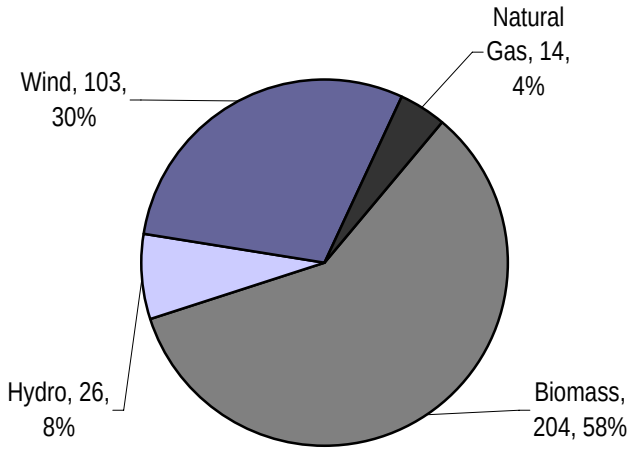
## *Energy Portfolio*

Figure 18: Current Generation by Technology (GWh)



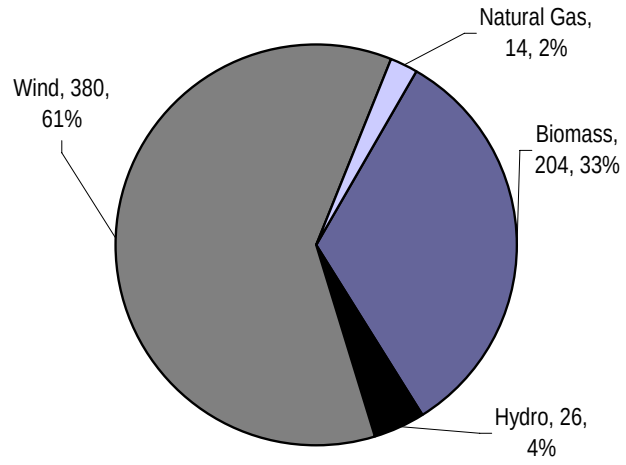

Source: Company reports

Figure 19: Current Capacity by Energy Type (GWh)




Source: Company reports

Figure 20: 2007 Proforma Capacity by Energy Type (GWh)




Source: Company reports

## *Catalysts*

- Spring 2008 announcement of winners of the Quebec 2000MW RFP (in partnership with Gaz Métro, BLX has submitted three bids)
- If its three bids are selected: project milestones advancing towards the commercial operation dates of 2010 and 2011 for its 375MW of wind power under 20 year contracts with Hydro-Quebec
- Rights to 90MW Southwest Ontario wind project with expected implementation Q408 (30 MW), Q409 (60 MW)
- Developments advancing its exposure to solar energy via its interest in CESOn

Growth in the stock going forward will likely be driven by additions to the company's operating pipeline with long term PPA's and the successful execution of its growth objectives in river hydro, wind and solar energy generation.

With $82 million in cash and equivalents on its balance sheet at Sept. 30, 2007 and a credit facility in France of approximately EUR 165 million (out of EUR 265 million available) BLX is well positioned to be an acquirer and developer of additional alternative energy assets and development projects.

## Historical Revenue and Electricity Output

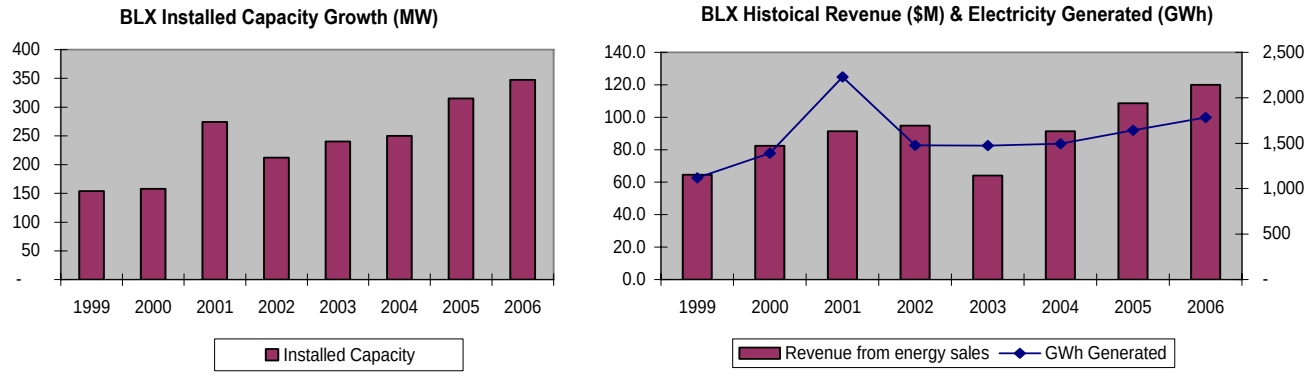
Table 21: BLX Revenue and Electricity Output

| BLX (FYE Dec. 31) | 1999 | 2000 | 2001 | 2002* | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|
| **Revenue from energy sales ($M)** | 64.7 | 82.4 | 91.4 | 94.8 | 64.1 | 91.4 | 108.7 | 120.0 |
| *yoy* | *148%* | *27.5%* | *10.8%* | *3.8%* | *-32.4%* | *42.5%* | *19.0%* | *10.4%* |
| **Cash flows from operations ($M)** | 14.0 | 17.8 | 19.4 | 11.4 | 7.1 | 12.0 | 26.2 | 24.5 |
| *% Rev* | *22%* | *22%* | *21%* | *12%* | *11%* | *13%* | *24%* | *20%* |
| **Installed Capacity (MW)** | 154 | 158 | 274 | 212 | 240 | 250 | 315 | 347 |
| *yoy* | | *2.6%* | *73.4%* | *-22.6%* | *13.2%* | *4.2%* | *26.0%* | *10.2%* |
| **Annual Generation (GWh)** | 1,119 | 1,390 | 2,228 | 1,477 | 1,473 | 1,493 | 1,642 | 1,782 |
| *yoy* | | *24.2%* | *60.3%* | *-33.7%* | *-0.3%* | *1.4%* | *10.0%* | *8.5%* |
| **Generating Stations** | 12 | 13 | 18 | 12 | 17 | 17 | 20 | 22 |

Source: Company reports; * - Boralex Power Income Fund spun out Q1 2002

## Growth Profile

Figure 21: Installed Capacity and Revenue Growth




Source: Company reports

## Consensus Estimates

| Ticker | Rating | Trdg Curr | Local Price 18-Nov-07 | Target | Pot. Return | % of 52 week Low | High | Mkt. Cap. ($mm) | Revenue CY07E | CY08E | EPS CY07E | CY08E | P/E CY07E | CY08E | EV/Sales CY07E | CY08E | EV/EBITDA CY07E | CY08E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSX:BLX | NR | CAD | 15.85 | 19.32 | 22% | 186% | 82% | 594 | 160 | 165 | 0.58 | 0.74 | 27.5x | 29.0x | 4.3x | 4.1x | 13.4x | 10.5x |

Source: Bloomberg and Capital IQ

BLX is currently followed by 7 analysts with an average twleve-month price target of $19.79, consistent with our view of its moderate 12-month growth profile.

## Risks

We believe the following could pose risks to BLX

- Lower electricity prices and its merchant business
- Fuel supply risks in the biomass wood-residue operations
- Seasonality in electricity demand and wind conditions
- Regulatory changes

# INVESTMENT HIGHLIGHTS – CANADIAN HYDRO DEVELOPERS INC. (KHD–T)

**Haywood Analyst**: Max Zureski (mzureski@haywood.com)

**Rating**: Sector Perform

**Target Price**: $7.00

**Risk Profile**: Moderate

**Haywood Estimates**:

| | 2006A | 2007E | 2008E |
|---|---|---|---|
| **Forecast** | | | |
| Wind Generation (GWh) | 264.9 | 411.2 | 639.8 |
| Hydro Generation (GWh) | 404.9 | 409.3 | 409.9 |
| Biomass Generation (GWh) | 105.1 | 125.6 | 125.2 |
| Total Generation (GWh) | 774.9 | 946.1 | 1,174.8 |
| | | | |
| EBITDA | $27,256.0 | $42,649.9 | $64,928.1 |
| CFPS (diluted) | $0.19 | $0.20 | $0.32 |
| EPS (diluted) | $0.07 | $0.07 | $0.14 |
| Capital Expenditures | $222,083.0 | $36,792.0 | $509,282.7 |
| Net Debt | $254,658.0 | $271,319.6 | $737,374.5 |
| | | | |
| **Valuation Parameters** | | | |
| EV / EBITDA | | 27.6x | 25.3x |
| P/CFPS (diluted) | | 33.3x | 20.9x |
| P/E (diluted) | | 97.7x | 48.5x |
| Target EV / EBITDA | | 28.6x | 26.0x |

Source: Company reports and Haywood Securities

Canadian Hydro Developers Inc. (KHD) is a pure-play independent developer, owner, and operator of renewable power generation facilities in Alberta, British Columbia, and Ontario. KHD has established revenue-generating assets, with 19 hydro, wind and biomass facilities creating a net generating capacity of 265MW. In addition, KHD has a near-term development pipeline of an additional 403MW of generating capacity from 8 projects under construction and almost 1,350MW of future development potential.

A mature operator in the renewable energy space, KHD has been publicly listed since 1990, beginning as a hydroelectricity developer and producer that has since expanded into wind and biomass. Wind will be the largest contributor to KHD growth going forward, in our opinion, due to the scale of projects under construction and in development.

KHD's operational and development projects are diversified by energy source and geography, mitigating the risk and uncertainty of relying on favourable hydrology and capacity utilization to drive revenue. Having said that, we believe the market has priced KHD's near-term development into the stock as management has a proven track record of moving projects from development into production (growing from the 3MW Belly River hydro plant in Alberta to the present 19 operating facilities). The installed base of operating power-generating facilities and projects in construction with long-term PPA's also provide a measure of downside protection. The value in this stock is not dependent on any one significant binary catalyst such as the submission to the BC Clean Power Call or reliance on any one particular technology.

Table 22: Project Portfolio

| Project Name | Location | Type | Ownership | Net Capacity (MW) | Generation (GWh) | Counter Party/ Power Purchaser | Expiry of PPA | Approx. Years Remaining |
|---|---|---|---|---|---|---|---|---|
| Akolkolex | B.C. | Hydro | 100% | 10.0 | 52.7 | BC Hydro | 2015 | 8 |
| Pingston | B.C. | Hydro | 50% | 22.5 | 89.0 | BC Hydro | 2023 | 16 |
| Upper Mamquam | B.C. | Hydro | 100% | 25.0 | 98.2 | BC Hydro | 2025 | 18 |
| Belly River | Alberta | Hydro | 100% | 3.0 | 12.0 | Balancing Pool | 2011 | 4 |
| Waterton | Alberta | Hydro | 100% | 2.8 | 12.4 | Balancing Pool | 2012 | 5 |
| St. Mary | Alberta | Hydro | 100% | 2.3 | 12.6 | Balancing Pool | 2012 | 5 |
| Taylor | Alberta | Hydro | 50% | 6.5 | 22.1 | Alberta Spot | n/a | n/a |
| Cowley Ridge | Alberta | Wind | 100% | 21.4 | 55.0 | Balancing Pool | 2013 | 6 |
| Taylor Wind | Alberta | Wind | 100% | 3.4 | 6.6 | Alberta Spot | n/a | n/a |
| Cowley North | Alberta | Wind | 100% | 19.5 | 47.6 | Alberta Spot | n/a | n/a |
| Sinnot | Alberta | Wind | 100% | 6.5 | 15.4 | Alberta Spot | n/a | n/a |
| Soderglen | Alberta | Wind | 50% | 35.3 | 119.8 | Alberta Spot | n/a | n/a |
| GPEC | Alberta | Biomass | 100% | 25.0 | 162.7 | Various | 2019+ | 12 |
| Ragged Chute | Ontario | Hydro | 100% | 6.6 | 36.1 | OEFC | 2011 | 4 |
| Moose Rapids | Ontario | Hydro | 100% | 1.3 | 5.7 | OEFC | 2027 | 20 |
| Appleton | Ontario | Hydro | 100% | 1.4 | 6.6 | OEFC | 2024 | 17 |
| Galetta | Ontario | Hydro | 100% | 1.6 | 7.9 | OEFC | 2009 | 2 |
| Misema | Ontario | Hydro | 100% | 3.2 | 13.3 | Ontario Spot | n/a | n/a |
| Melancthon I | Ontario | Wind | 100% | 67.5 | 194.8 | OPA | 2026 | 19 |
| **Total** | **19** | | | **264.8** | **970.5** | | | **10.5** |

Source: Company reports

Table 23: Operating Projects

| | Number of Projects | % of Portfolio Concentration | Generating Capacity Factor (MW) | % of Portfolio Capacity | Average Annual Output (GWh) | Capacity Utilization |
|---|---|---|---|---|---|---|
| Ontario | 6 | 32% | 81.6 | 31% | 264.4 | 37% |
| Alberta | 10 | 53% | 125.7 | 47% | 466.2 | 42% |
| B.C. | 3 | 16% | 57.5 | 22% | 239.9 | 48% |
| **Total** | **19** | **100%** | **264.8** | **100%** | **970.5** | **42%** |

Source: Company reports

KHD's development portfolio is set to undergo a shift the company from that of having a relatively balanced hydro and wind portfolio to one weighted more towards wind energy. So while we rate KHD as a peer comparison to PCC and ROR in this report, the outlook for the company is decidedly wind-power focused, though serves as a comparison with respect to development capacity and as a competitor within the B.C. river hydro space.

Table 24 Projects Under Construction

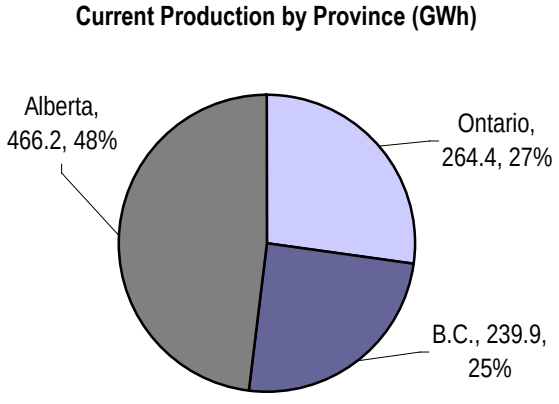
| Project Name | Location | Type | Ownership | Net Capacity (MW) | Generation (GWh) | Counter Party/ Power Purchaser | Expiry of PPA | Approx. Years Remaining |
|---|---|---|---|---|---|---|---|---|
| Melancthon II | Ontario | Wind | 100% | 132.0 | 350.6 | OPA | 2028 | 21 |
| Wolfe Island | Ontario | Wind | 100% | 197.8 | 537.5 | OPA | 2028 | 21 |
| Royal Road | Ontario | Wind | 100% | 18.0 | 47.3 | OPA | 2029 | 22 |
| | | | | | | | | |
| Island Falls | Ontario | Hydro | 50% | 10.0 | 46.5 | OPA | 2029 | 22 |
| Bone Creek | B.C. | Hydro | 100% | 20.0 | 84.0 | BC Hydro | 2029 | 22 |
| Clemina Creek | B.C. | Hydro | 100% | 9.9 | 32.0 | BC Hydro | 2049 | 42 |
| Serpentine Creek | B.C. | Hydro | 100% | 9.6 | 34.0 | BC Hydro | 2049 | 42 |
| English Creek | B.C. | Hydro | 100% | 5.0 | 20.0 | BC Hydro | 2049 | 42 |
| **Total** | **7** | | | **402.3** | **1,151.9** | | | **29** |

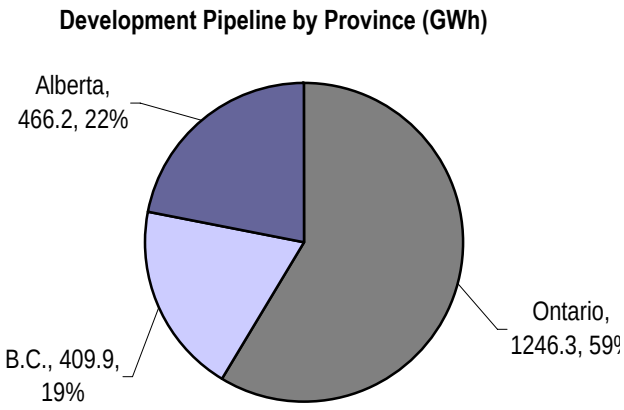
| Location | Number of Projects | % of Portfolio Concentration | Generating Capacity (MW) | % of Portfolio Capacity | Average Annual Output (GWh) | Capacity Utilization |
|---|---|---|---|---|---|---|
| Ontario | 4 | 50% | 357.8 | 89% | 981.9 | 31% |
| B.C. | 4 | 50% | 44.5 | 11% | 170.0 | 44% |
| **Total** | **8** | **100%** | **402.3** | **100%** | **1,151.9** | **33%** |

Source: Company reports

## *Geographic Diversification*

Figure 22: Current Production and Development Pipeline

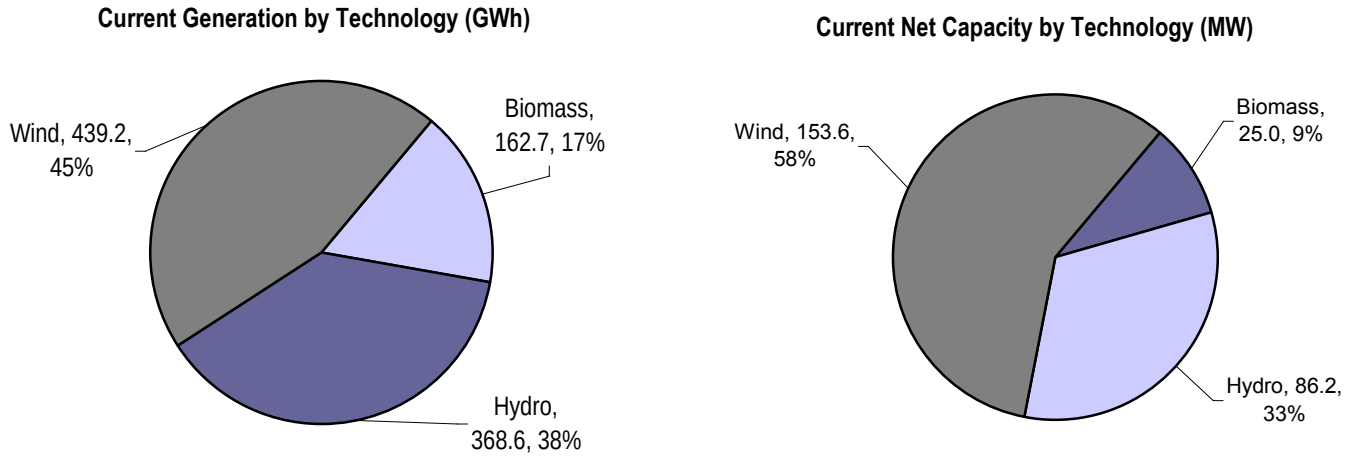



Source: Company reports

## Energy Portfolio

Figure 23: Current Generation and Capacity by Technology




Source: Company reports

## Catalysts

KHD presents a strong portfolio of hydroelectric and wind power generating stations that are diversified by geographic base and revenue stream, offering a measure of downside risk to investors. Value creation going forward will be driven by the achievement of milestones within KHD's future development portfolio. Announcements surrounding new contracts, successful debt financings and acquisitions of accretive and meaningfully sized projects have been primary drivers of the stock. Due to its relatively large installed base of power generation that we believe is largely priced into KHD at present, it will be difficult for KHD to match the growth profile it has enjoyed to date and that for which PCC and ROR are positioned to capture. Near term catalysts would be results from the Manitoba RFP process, a decision on its Dunvegan project and results from the upcoming BC Clean Power Call.

## Historical Revenue and Electricity Output

Table 25: Project Portfolio

| KHD (FYE Dec. 31) | 2002A | 2003A | 2004A | 2005A | 2006A |
|---|---|---|---|---|---|
| **Revenue ($M)** | 16.8 | 21.7 | 23.7 | 28.9 | 48.2 |
| *yoy* | | *29.2%* | *9.2%* | *21.9%* | *66.8%* |
| **Cash Flow From Ops* ($M)** | 6.2 | 8.9 | 10.3 | 9.9 | 22.8 |
| *% Rev* | | *41%* | *43%* | *34%* | *47%* |
| **Installed Capacity** (MW) net** | 89 | 104 | 115 | 162 | 230 |
| *yoy* | | *16.9%* | *10.5%* | *41.1%* | *41.7%* |
| **Annual Generation (GWh)** | 294 | 360 | 400 | 465 | 707 |
| *yoy* | | *22.5%* | *11.1%* | *16.3%* | *52.0%* |

Source: Company data

KHD is currently followed by ten analysts (including Haywood Securities) with an average twleve-month price target of $7.56, consistent with our view of its limited 12-month growth profile and $7.00 target price and Sector Perform rating.

## *Risks*

We believe the following could pose risks to KHD

- Moderate Forecast risk with a number of operational facilities underpinned by long-term contracts
- Risk to our forecast surrounds capital costs and timing of revenue of project to be completed (Melancthon II and Wolfe Island)
- Lower than expected hydrology or wind reliability
- Equity dilution and interest rate risk with additional debt financing

# INVESTMENT HIGHLIGHTS – GREAT LAKES HYDRO INCOME FUND (GLH.UN –T)

Great Lakes Hydro Income Fund (GLH.UN-T) is the largest power income fund in North America with 1,015MW of power generating capacity and an average annual production of 3,875GWh. GLH.UN is a pure-play hydroelectricity company producing electricity exclusively from environmentally friendly hydroelectric resources.

The Fund completed its IPO on November 18, 1999 with three stations in Ontario and Quebec; the company now owns, operates and manages 26 hydroelectric generating stations located on eight river systems in four geographic regions across North America: (Quebec, Ontario, British Columbia and New England). Collectively these stations generate annual revenue of over $150M. Brookfield Power, which comprises all the power operations of Brookfield Asset Management, owns 50.1% of the Fund's outstanding units. In addition, most of the power generated is sold to Brookfield Power under long-term contracts with an average duration of 15-years and an average fixed price of $0.045/KWh.

Table 26: Long-life Assets and a Strong Partner

| Asset | Counter party | Years Remaining | Price (¢/KWh) |
|---|---|---|---|
| Quebec | Brookfield Power | 13 | 3.7 |
| Ontario | Brookfield Power | 16 | 5.9 |
| Ontario (Carmichael) | Ontario Electricity Financial Corp. | 35 | 10.7 |
| British Columbia | Brookfield Power | 15 | 3.6 |
| New England | Brookfield Power | 17 | 4.1 |
| | Central Maine Power | 3 | 14.7 |
| | Public Service of New Hampshire | 17 | 19.1 |
| **Weighted Average** | | **15** | **4.5** |

Source: Company reports

As a mature operator in this space GLH.UN is now experiencing modest growth with additional upside most likely to be achieved through accretive acquisitions of additional hydroelectric or run-of-river sites that can be brought into its portfolio to realize economies of scale and operating efficiencies. Though the Company has what are considered high quality assets, its limited growth profile presents few catalysts within the investment horizon that might materially impact cash flow and the Fund's unit price. GLH.UN has stated it is not, at this time, seeking to convert to a corporate structure from its current trust structure and will continue to pursue a strategy of reinvesting in its asset base to enhance the company's reliability and operating efficiencies, and to seek acquisition targets that meet the criteria of the fund. However, it would likely continue to assess the most appropriate option to enhance value as the new trust structure legislation approaches in 2011.

Key drivers at this point would be hydrology and thus increased production capacity utilization at any one of its sites over a given period of time, as well as M&A activity to expand the company's project portfolio.

Table 27: Project Portfolio

| | Number of Projects | % of Portfolio Concentration | Generating Capacity (MW) | % of Portfolio Capacity | Annual Long-term Average (GWh) | Capacity Utilization |
|---|---|---|---|---|---|---|
| **Quebec** | 4 | 15% | 249 | 25% | 1,492 | 68% |
| **Ontario** | 5 | 19% | 508 | 50% | 836 | 19% |
| **BC** | 2 | 8% | 82 | 8% | 523 | 73% |
| **New England** | 15 | 58% | 176 | 17% | 1,023 | 66% |
| **Total** | **26** | **100%** | **1,015** | **100%** | **3,874** | **44%** |

Source: Company reports

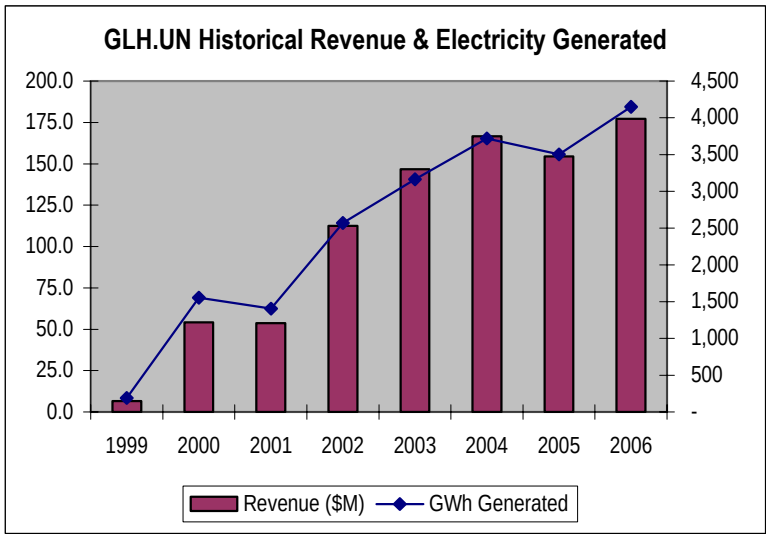
### *Geographical Diversification*

GLH.UN presents a strong portfolio of hydroelectric generating stations that are diversified by geographic base and revenue stream, offering little downside risk to investors. With a portfolio of mature assets, GLH.UN value creation going forward will likely be attained by unexpectedly favourable hydrology and capacity utilization across its asset base or through accretive acquisitions of meaningfully sized hydro projects. With this, we note that the recent acquisition of the Carmichael Falls Generating Station (20MW) in Ontario is evidence that GLH.UN is an acquirer of quality run of river projects.

### *Portfolio Additions*

GLH.UN's most recent addition to its asset base occurred in Ontario with the Carmichael Falls Generation Station. Carmichael Falls has an installed capacity of 20MW supplying 86GWh of electricity to the Ontario Electricity Financial Corporation (OEFC). The PPA is a take-or-pay contract with the OEFC subject to renewal in 2042, with no minimum or maximum delivery commitment and an average rate of $107/MWh escalating every year up to $138/MWh in 2011. From 2012 to 2020 the average fixed rate is $44/MWh with an annual escalation for the remainder of the term.

Figure 24: Historical Revenue and Electricity Output




Source: Company reports

Consensus

| Ticker | Rating | Trdg Curr | Local Price 1-Nov-07 | Target | Pot. Return | % of 52 week Low | High | Mkt. Cap. | Revenue CY07E | CY08E | EPS CY07E | CY08E | P/E CY07E | CY08E | EV/Sales CY07E | CY08E | EV/EBITDA CY07E | CY08E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSX:GLH.UN | NR | CAD | 19.38 | 19.21 | -1% | 117% | 90% | 936 | 172 | 180 | 0.82 | 0.93 | **23.6x** | **20.8x** | **8.9x** | **8.5x** | **12.6x** | **12.1x** |

Source: Bloomberg and Capital IQ

GLH.UN is currently followed by 7 analysts with an average twleve-month price target of $19.21

## *Risks*

We believe the following could pose risks to GLH.UN:

- Rising interest rates could impact GLH.UN unit price
- Operational issues
- Lower than expected hydrology (Q207 was lower than expected in Ontario and Quebec)
- An inability to grow its asset base through acquisitions

# INVESTMENT HIGHLIGHTS – INNERGEX RENEWABLE ENERGY (IEF.UN–T)

Innergex Renewable Energy (Innergex), a private company formerly known as Innergex Management Inc, announced its intention to complete its Initial Public Offering (IPO) on October 26, 2007. An independent developer and operator of renewable power generation facilities, Innergex has hydroelectric and wind power generating assets in varying stages of development and a 16% interest in Innergex Power Income Fund (TSX: IEF.UN).

Innergex's near-term focus is on opportunities in Quebec and British Columbia; the company will then likely evaluate future opportunities in the US (wind power) and concurrently pursue strategic acquisitions of development projects.

Innergex's portfolio consists of 40MW of operating capacity (8MW Glen Miller hydro facility and 32MW through its interest in IEF.UN), 9 development assets contracted under long-term EPA's (565MW gross - two thirds of which is anticipated to be online by 2010 - the balance by 2012 and together expected to generate $75M annual revenue by 2013), and 21 prospective projects to drive longer-term growth (1,638MW). With this, Innergex presents a new publicly-traded pure-play Canadian entrant into the space with a strong pipeline, an experienced management team in the wind power and river hydro space and a strong balance sheet (the equity required for the 293 MW of near-term projects with PPA's is already fully funded) that positions Innergex as a growth story and potential consolidator in the renewable energy/IPP space.

### *New Entrant Positioned for Growth*

#### Operating Projects:

8MW in operating power-generating facilities; Innergex also owns 16% of the assets of Innergex Income Fund that has 10 Hydro and 2 Wind projects with 32 MW of net capacity.

#### Development Pipeline:

565MW from 9 development projects with EPA's already contracted (5 hydro and 4 wind power)

#### Prospective Projects:

1,638MW from 21 prospective projects (3 hydro and 18 wind power) diversified geographically.

Innergex would be competing with both PCC and ROR in upcoming RFP's and Calls for Power in BC with both its run-of-river and wind power generating projects. We monitor the development of Innergex as an owner and operator of a portfolio of run-of-river hydroelectric plants and when considering its goal of expanding its asset base and its position as a potential consolidator in the space. Though wind power assets will likley be a key driver in the stock, it does have significant exposure to run-of-river hydro and a management team experienced with bringing deveopment projects into production (348MW of both hydro and wind projects).

Table 28: Project Portfolio

| Operating Projects | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Facility** | **Location** | **Type** | **Ownership** | **Gross Capacity (MW)** | **Average Generation (GWh)** | **PPA** | **Commercial In-Service Date** | **Expiry of PPA** | **Counter Party/ Power Purchaser** |
| Glen Miller | Ontario | Hydro | 100% | 8.0 | 41.5 | √ | 2005 | 2025 | OPA |
| **Total Operating** | **1** | | | **8.0** | **41.5** | **1** | | | |

Source: Company reports

| Development Projects with PPAs | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Facility** | **Location** | **Type** | **Ownership** | **Gross Capacity (MW)** | **Average Generation (GWh)** | **PPA** | **Commercial In-Service Date** | **Expiry of PPA** | **Counter Party/ Power Purchaser** |
| Umbata Falls | Ontario | Hydro | 49% | 23.0 | 109.1 | √ | 2008 | 2028 | OPA |
| Carelton | Quebec | Wind | 100% | 109.5 | 340.5 | √ | 2008 | 2028 | Hydro-Quebec |
| Ashlu Creek | B.C. | Hydro | 100% | 49.9 | 264.0 | √ | 2009 | 2029 | BC Hydro |
| Matawin | Quebec | Hydro | 100% | 15.0 | 62.5 | √ | 2009 | 2035 | Hydro-Quebec |
| Kwoiek Creek | B.C. | Hydro | 50% | 49.9 | 215.0 | √ | 2010 | 2050 | BC Hydro |
| Mkw'Alts | B.C. | Hydro | 100% | 47.7 | 156.0 | √ | 2010 | 2030 | BC Hydro |
| Montagne Seche | Quebec | Wind | 38% | 58.5 | 182.7 | √ | 2011 | 2031 | Hydro-Quebec |
| Gros Morne (Phase I) | Quebec | Wind | 38% | 100.5 | 312.5 | √ | 2011 | 2032 | Hydro-Quebec |
| Gros Morne (Phase II) | Quebec | Wind | 38% | 111.0 | 345.2 | √ | 2012 | 2032 | Hydro-Quebec |
| **Total in Development** | **9** | | | **565.0** | **1987.6** | **10** | | | |

Source: Company reports

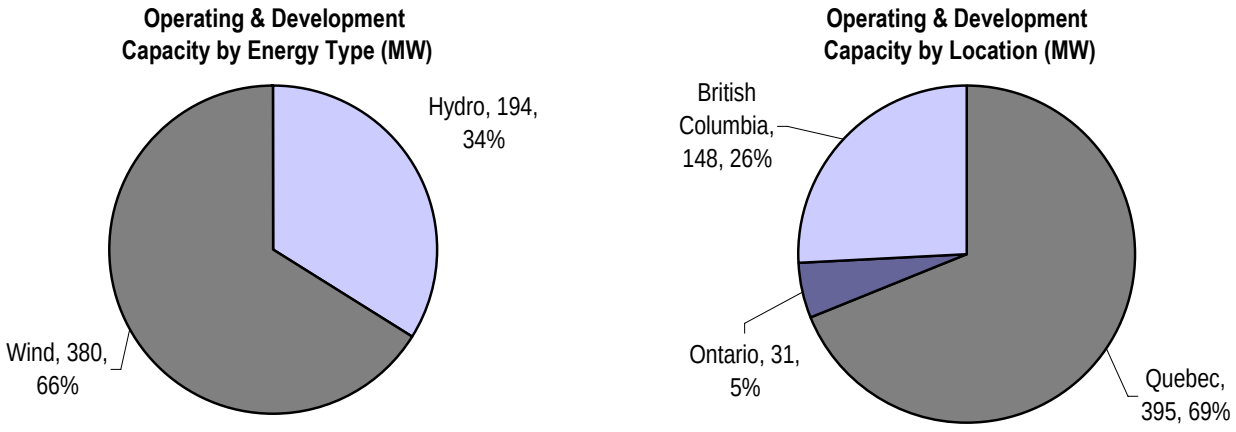
Table 29: ProspectiveProjects

| Prospective Projects | | | | | |
|---|---|---|---|---|---|
| **Facility** | **Location** | **Type** | **Ownership** | **Gross Capacity (MW)** | **Expected Power Purchaser** |
| Roussillon | Quebec | Wind | 100% | 108.0 | Hydro-Quebec |
| Kamouraska | Quebec | Wind | 100% | 124.5 | Hydro-Quebec |
| Massif-deSud | Quebec | Wind | 100% | 90.0 | Hydro-Quebec |
| Saint-Constant | Quebec | Wind | 100% | 70.0 | Hydro-Quebec |
| Club des Hauteurs | Quebec | Wind | 100% | 195.5 | Hydro-Quebec |
| Haute-Cote-Nord Est | Quebec | Wind | 100% | 170.0 | Hydro-Quebec |
| Haute-Cote-Nord Ouest | Quebec | Wind | 100% | 168.0 | Hydro-Quebec |
| Rivere-aux-renards | Quebec | Wind | 50% | 25.0 | Hydro-Quebec |
| Les Mechins | Quebec | Wind | 38% | 150.0 | Hydro-Quebec |
| Kipawa | Quebec | Hydro | 48% | 42.0 | Hydro-Quebec |
| Kokish | B.C. | Hydro | 100% | 9.9 | BC Hydro |
| Kaipit | B.C. | Hydro | 100% | 9.9 | BC Hydro |
| **Various Others in BC:** | | | | **475.0** | |
| Carp Forest | B.C. | Wind | 100% | | BC Hydro |
| Crater Mountain | B.C. | Wind | 100% | | BC Hydro |
| Mount Crucil | B.C. | Wind | 100% | | BC Hydro |
| Poplar Hills | B.C. | Wind | 100% | | BC Hydro |
| Nulki Hills | B.C. | Wind | 100% | | BC Hydro |
| Saxton Lake | B.C. | Wind | 100% | | BC Hydro |
| Sechelt Peninsula | B.C. | Wind | 100% | | BC Hydro |
| Tatuk Lake | B.C. | Wind | 100% | | BC Hydro |
| Trachyte Hills | B.C. | Wind | 100% | | BC Hydro |
| **Total Prospective** | **21** | | | **1637.8** | |

Source: Company reports

## *Development Capacity – Longer term Value Creation*

Figure 25: Development Capacity by Type and Location




Source: Company reports

## *Catalysts*

- Initial public offering – closing date XX
- February 2008 announcement of the winners of the Quebec 2,000MW RFP (Innergex has submitted bids for 322.5MW)
- Innergex intends to submit a bid into the recently announced Quebec Municipal Wind RFP
- BC's Clean Power Call (Innergex also intends to submit bids of almost 20MW into BC Hydro's Standing Offer Program)
- Project milestones leading to the commercial operation of hydro and wind power projects from 2008 – 2012 (~565MW of gross installed capacity)

## *Risks*

We believe the following could pose risks to BLX

- Execution risk – the near term and development pipeline of projects may not be brought on line within budget and as planned, missteps could impact the stock
- Supply risk – wind generating assets may face supply constraints and price increases, thereby impacting profitability
- Seasonality in electricity demand, wind conditions and hydrology
- Interest rate and financing risks for those projects in development
- Regulatory and political factors negatively impacting permitting and PPA's

# INVESTMENT HIGHLIGHTS – SYNEX INTERNATIONAL INC. (SXI–T)

Synex International Inc. (SXI-T) is an established independent power producer experienced in constructing, owning and operating small hydro projects in British Columbia and other parts of North America. It has the distinct advantage of having the in-house capabilities of its consulting engineering group, that may prove advantageous in bringing its selected development projects into commercial productiion. SXI owns and operates two hydroelectric facilities, 3.8MW Mears Creek and a 12.5% interest in 6.5MW China Creek Hydro, with installed capacity of 10MW, the Kyuquot regulated utility and a development pipeline of about 20MW of run-of-river hydro projects targeted to BC Hydro's 2006 Call and the Standing Offer Program (includes projects of < 10MW)

SXI is comprised of Synex Energy Resources Ltd (its electric energy division) and Sigma Engineering Ltd (its consulting engineering division). Sigma Engineering has a 24-year history of providing consulting services for the control, use and design of hydroelectric and other power generation facilities; hydrology and water related environmental assessments that provide a base-revenue generating business unit and measure of downside protection. Synex Energy initially concentrated on supplying energy to remote facilities (communities, mining and logging camps) but is now in position to leverage its small hydro expertise on a development pipeline of small projects in the BC Hydro 2006 Call and the upcoming B.C. Standing Offer Program.

SXI's near to medium-term focus will be to submit proposals into the 2008 Standing Offer Program in BC, with the aim of bringing 17.4MW from its pipeline of development projects into production starting in 2008 through to 2010.

## *An Integrated Run-of-River Company*

Table 30: Operating Projects

| Facility | Location | Type | Ownership | Gross Capacity (MW) | PPA | Commercial In-Service Date | Duration of PPA (yrs) | Counter Party/ Power Purchaser |
|---|---|---|---|---|---|---|---|---|
| Mears Creek | B.C. | Hydro | 100% | 3.8 | √ | 2004 | 20 | BC Hydro |
| Kyuquot Power Ltd. | B.C. | (powerline) | 100% | N/A | √ | 2006 | N/A | BC Hydro |
| China Creek Hydro | B.C. | Hydro | 13% | 6.5 | √ | 2005 | 20 | BC Hydro |
| **Total Operating** | **3** | | | **10.3** | **3** | | | |

Source: Company reports

Table 31: Development Projects

| Facility | Location | Type | Ownership | Gross Capacity (MW) | PPA | Commercial In-Service Date | Expiry of PPA | Counter Party/ Power Purchaser |
|---|---|---|---|---|---|---|---|---|
| Cypress Creek | B.C. | Hydro | 100% | 2.8 | X | N/A | N/A | N/A |
| McKelvie Creek | B.C. | Hydro | 100% | 3.4 | X | Oct 1/08 | N/A | N/A |
| Barr Creek | B.C. | Hydro | 100% | 4.0 | √ | May 1/09 | N/A | BC Hydro |
| Victoria Lake | B.C. | Hydro | 100% | 10.0 | √ | May 1/10 | N/A | BC Hydro |
| **Total in Development** | **3** | | | **20.2** | | | | |

Source: Company reports; Note: we expect the Cypress Creek project to be submitted to the BC Standing Offer Program

### *Catalysts*

- 2008 Bid submissions to BC's Clean Power Call and Standing Offer Program
- Project milestones leading to the commercial operation of hydro power projects from 2008 – 2010 (~20 MW of installed capacity)

### *Risks*

We believe the following could pose risks to SXI

- Execution risk – the near term and development pipeline of projects may not be brought on line within budget and as planned, mis-steps could impact the stock
- Interest rate and financing risks for those projects in development
- Regulatory and political factors negatively impacting permitting, PPA's and the Standing Offer Program contracts

# APPENDIX A: The BC 2006 Call for Power

The BC Hydro 2006 Open Call for Power was targeting the procurement of 2,500GWh per year of electricity from projects with capacity of 10MW or more, plus an additional 200GWh per year of electricity from projects with capacity of less than 10MW. The call was 'open' which meant that all proven generation technologies, except nuclear, would be eligible to participate in the Call. Terms of the EPAs ranged from 15 to 40 years, with commercial operation date targets of between October 1, 2007 and November 1, 2010 as determined by the bidder. In the call for tender (CFT) BC Hydro received 61 applications from 37 bidders with 53 separate projects. Only 48 of these projects proceeded to the evaluation phase.

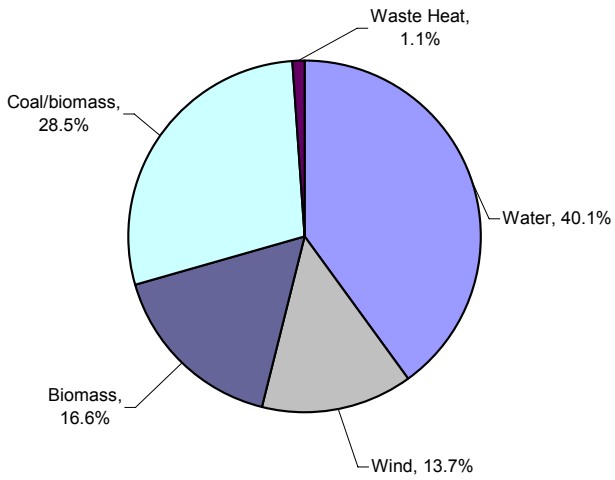
During the evaluation phase the normalized bid prices, green credits, hourly firm energy, greenhouse gas obligations and interconnection/transmission costs are assessed for each of the 48 projects. From this levelized comparative analysis, the optimal portfolio of projects was selected and EPAs were awarded. While pricing is a key consideration, the provincial target for 50% clean electricity and other non-price factors played a role in the selection of projects for EPAs.

## *Call Award Volumes*

EPAs were granted to 38 new IPP projects in mid-2006, which would potentially generate up to 6,471 GWH per year of electricity from large projects and 654 GWh per year from small projects. Large projects had an average plant gate price of $74/MWh and an average bid price of $87.50/MWh; small projects had an average plant gate price of $69.9/MWh and an average bid price of $76.80/MWh. The increase in award volumes in the 2006 Call was based on the unique characteristics of this Call (allowance for new technologies), the expected gap in forecasted load in the future, as well as allowances for attrition and outages.

BC Hydro has estimated there will be approximately 25-40% combined attrition and outage rates for the contracts awarded in the 2006 Call for Power. This is based on previous Power Calls, where roughly 20% of awarded contracts terminated early or were found to be unlikely to proceed at the bottom end of the range and up to 30% at the top end of the range. However, the 2006 Call was designed to reduce attrition with higher security requirements and a Risk Assessment analysis prior to submission. On the flip side, the 2006 Call did include technologies that were not previously allowed in previous BC Power Calls which may result in increased attrition rates. Figure XX details the EPAs awarded based on technology. While hydro projects still represented a majority of the power production, a diversity of technologies is represented.

Figure 26: Total Energy by Resource Technology




Source: BC Hydro

In terms of outages, the 2006 Call required bidders to quote a firm energy volume without accounting for planned outages. Historical outage rates published by the North American Electric Reliability Council were in the range of 5-10%. Also, BC Hydro's load forecast in the F2006 Call was roughly 3,000GWh per year short of more current forecasts for the 2011/12 timeframe. Even with the extra power contracts awarded in the F2006 Call, the system energy demand is still estimated by BC Hydro to be in a shortfall position by 1,300GWh for 2011.

### *Cost effectiveness*

Cost effectiveness includes consideration for least cost initiatives, but also for consideration of reliability, safety, timing, location, schedule for completion, financing arrangements, and public/First Nation impacts. BC Hydro believes the cost effectiveness is a more comprehensive benchmark in assessing the potential for individual projects than merely cost alone.

BC Hydro has affirmed that the F2006 Call was a competitive process as the results of this Call were similar to awards made in Ontario, Quebec and the Maritimes, as well as in some U.S. states within the same timeframe It is evident from the bid prices in these regions that inflationary pressures for new assets are pushing prices upwards by 40-70% across all resource types except for hydro which is about 20-25% higher.

### *Rate impact*

F2012 is the first full year that electricity is expected to be delivered under the EPAs granted in the F2006 Call. The average cost of supply at the plant gate in 2007 dollars is measured at $79.5/MWh. BC Hydro's current average electricity cost under the F07/08 RRA is $33.1/MWh. The first year rate impact (for 2007) of the F2006 Call is 8.1% This impact diminishes over time as the cost of electricity purchased under these agreements declines in line with inflation, as the load in BC grows and the revenue requirements for BC Hydro increase. The price of new electricity in the future is expected to increase regardless of the source primarily because of the magnitude of future energy needs. The cost of these electricity contracts, while they may appear costly currently, declines in real terms over time and allows for some stability in terms of price and volume of supply in the future.

## Table 32: Projects Awarded EPAs

| | Company | Project | Energy Source | Plant Capacity (MW) | Total Energy (GWh) | Current Status at Environmental Assessment Office |
|---|---|---|---|---|---|---|
| **Large** | Plutonic Power Corp | East Toba/Montrose Hydroelectric | water | 196.00 | 702.00 | Certified April 25, 2007; $250M investment; 580 construction jobs and 13 operating jobs |
| | AESWapiti Energy Corp | AESWapiti Energy Corp | coal/biomass | 184.00 | 1,612.00 | Pre-application stage;$300M investment; 550 construction jobs and 100 operating jobs |
| | Dokie Wind Energy | Dokie Wind Project | wind | 180.00 | 536.00 | Certified August 10, 2006; $600M investment; 300 construction jobs and 30 operating jobs |
| | Bear Mountain Wind Ltd Partnership | Bear Mountain Wind Park | wind | 120.00 | 371.00 | Certified August 20, 2007; $240M investment; 5 operating jobs |
| | 3986314 Canada Inc. | Canada-Glacier/Howser/East Project | water | 90.50 | 341.00 | Pre-application stage;$240M investment; 450 construction jobs and 4 operating jobs |
| | Green Island Energy | Gold River Power Project | biomass | 90.00 | 745.00 | |
| | Kwalsa Energy Ltd Partnership | Kwalsa Energy Project | water | 85.90 | 384.00 | |
| | Anyox Hydro Electric Corp | Anyox and Kisault River Hydroelectric Projects | water | 56.50 | 242.00 | |
| | Compliance Power CorpowUpper Stave Energy Ltd Partnership | Princeton Power Project | coal/biomass | 56.00 | 421.00 | Pre-application stage;$200M investment; 230 construction jobs and 40 operating jobs |
| | Upper Stave Energy Ltd Partnership | Upper Stave Energy Project | water | 54.70 | 264.00 | |
| | Mackenzie Green Energy | Mackenzie Green Energy Centre | biomass/other | 50.00 | 441.00 | Application under review;$230M investment; 200 construction jobs and 30 operating jobs |
| | Kwoiek Creek Resources Ltd Partnership | Kwoiek Creek Hydroelectric Project | water | 49.90 | 147.00 | Application under review (awaiting supplementary information);$90M investment; 100 construction jobs and 6 operating jobs |
| | Mount Hays Wind Farm Ltd Partnership | Mount Hays Wind Farm | wind | 25.20 | 72.00 | |
| | Canadian Hydro Developers | Bone Creek Hydro Project | water | 20.00 | 81.00 | |
| | Songhees Creek Hydro | Songhees Creek Hydro Project | water | 15.00 | 61.00 | |
| | Plutonic Power Corp | Rain R iver Hydroelectric Project | water | 15.00 | 51.00 | Currently not being pursued |
| | **Total large projects** | **16** | | **1,288.70** | **6,471.00** | |
| **Small** | Hydromax Energy | Lower Clowhom | water | 9.99 | 48.00 | |
| | Hydromax Energy | Upper Clowhom | water | 9.99 | 45.00 | |
| | Highwater Power Corp | Kookipi Creek Hydroelectric Project | water | 9.99 | 39.00 | |
| | Cogenix Power Corp | Log Creek Hydroelectric Project | water | 9.99 | 38.00 | |
| | Canadian Hydro Developers | Cloemina Creek Hydro Project | water | 9.95 | 31.00 | |
| | KMC Energy Corp | Tamihi Creek Hydro Project | water | 9.90 | 52.00 | |
| | Valisa Energy Inc | Serpentine Creek Hydro Project | water | 9.60 | 29.00 | |
| | Synex Energy Resources | Victoria Lake Hydroelectric Project | water | 9.50 | 39.00 | |
| | Second Reality Effects | Fries Creek Project | water | 9.00 | 41.00 | |
| | Renewable Power Corp | Tyson Creek Hydro Project | water | 7.50 | 48.00 | |
| | Hupacasath First Nation | Corrigan Creek Micro Hydroelectric Project | water | 6.65 | 19.00 | |
| | Axiom Power | Clin Creek Hydro Project | water | 6.00 | 27.00 | |
| | EnPower Green Energy Generation | Savona ERG Project | waste heat | 5.89 | 41.00 | |
| | EnPower Green Energy Generation | 150 Mile House ERG Project | waste heat | 5.89 | 34.00 | |
| | Maroon Creek Hydro Partnership | Maroon Creek Hydro Project | water | 5.00 | 25.00 | |
| | Spuzzum Creek Power Corp | Sakwi Creek Run of River Project | water | 5.00 | 21.00 | |
| | Canadian Hydro Developers | English Creek Hydro Project | water | 5.00 | 19.00 | |
| | Synex Energy Resources | Barr Creek Hydroelectric Project | water | 4.00 | 15.00 | |
| | Raging River Power and Mining | Raging River 2 | water | 4.00 | 13.00 | |
| | Synex Energy Resources | McKelvie Creek Hydroelectric Project | water | 3.40 | 14.00 | |
| | Advanced Energy Systems | Cranberry Breek Power Project | water | 3.00 | 11.00 | |
| | District of Lake Country | Eldorado Reservoir | water | 0.80 | 4.00 | |
| | **Total small projects** | **22** | | **150.04** | **653.00** | |
| **Expansion** | Brilliant Expansion Power Corp | Brilliant Expansion 2 Project | water | 120.00 | 226.00 | |
| **Total** | | | | **1,558.74** | **7,350.00** | |

# APPENDIX B: The BC 2002/3 Call for Power

There were 16 successful bid applications in the 2002/03 Green Power Generation Call in BC out of 70 qualification statements submitted into the Call, from which 30 projects then pre-qualified to participate in the tender process. We note that BC Hydro had originally planned to acquire 800GWh/year from this Call for Power, however BC Hydro clearly decided to exceed the original target. Electricity contracts of up to twenty years were awarded to 14 hydro, one landfill gas and one wind energy project, with about 1,800GWh/yr of new electricity generation. Under the terms of the EPAs, these projects were to be operational by September 30, 2006. Out of the total, only two projects have actually been built. It is believed that issue was the fixed maximum price of $55/MWh (growing at 0.5CPI annually) stipulated in the EPA contracts for this Call. Many of the projects submitted into this Call for Power could not be economically viable at that price point.

Projects built under the terms of the EPA include the China Creek Hydro project and the Maxim Landfill Gas Cogeneration project. While these other projects did not meet the terms of the EPA agreement from this Call for Power, it does not mean that the projects have been deserted or terminated. In fact, we expect to see a number of applications from projects that won EPAs in this Call, in the Clean Call for Power, bid at much higher price points.

Table 33: Status of 2002/3 Call for Power Projects

| | Company | Project | Energy Source | Plant Capacity (MW) | Total Energy (GWh)/year | Location |
|---|---|---|---|---|---|---|
| **Large** | Coast Mountain Hydro Corp. | Forrest Kerr Run-of-River Hydroelectric Project | water | 112.00 | 541.00 | Stewart |
| | Stothert Power Corp. / Global Renewable Energy Partners Inc. | Holberg Wind Energy Project | wind | 58.50 | 176.00 | Holberg |
| | Cloudworks Energy LP | Mkw'alts Creek Hydro Project | water | 45.00 | 154.00 | Mount Currie |
| | Ledcor Power Inc. | Ashlu Creek Water Power Project | water | 42.00 | 200.00 | Squamish |
| | Ucona River Joint Venture | Ucona River Hydro Project | water | 35.00 | 125.00 | Gold River |
| | Interpac Resources Ltd. | Spuzzum Creek Power Project | water | 29.00 | 90.00 | Boston Bar |
| | Pacific Rim Power Corp. | Zeballos Lake Hydroelectric Facility | water | 21.85 | 93.00 | Zeballos |
| | Regional Power Inc. | Bear Hydro Project | water | 16.00 | 77.00 | Sechelt |
| | **Total large projects** | | **8** | **359.35** | **1,456.00** | |
| **Small** | Advanced Energy Systems 1LP | South Cranberry Creek Power Project | water | 6.60 | 33.00 | Revelstoke |
| | Hupacaseth First Nation | China Creek Small Hydroelectric Project | water | 5.60 | 25.00 | Port Alberni |
| | Synex Energy Resources Ltd. | Cypress Creek Hydroelectric Project | water | 3.10 | 11.00 | Gold River |
| | Princeton Energy Inc. | Hunter Creek Hydroelectric Generation Project | water | 2.40 | 10.00 | Hope |
| | Maxim Power (BC) Inc. | Maxim Landfill Gas Cogeneration Project | biogas | 1.85 | 15.00 | Delta |
| | Princeton Energy Inc. | Berkey Creek Hydroelectric Generation Project | water | 1.50 | 6.50 | Hope |
| | Larson Farms Inc. No. 593815 | Pierce Creek Hydroelectric Generation Project | water | 0.77 | 3.00 | Chilliwack |
| | **Total small projects** | | **7** | **21.82** | **103.50** | |
| **Expansion** | Brilliant Expansion Power Corporation | Brilliant Expansion Project | water | 120.00 | 203.00 | Castlegar |
| **Total** | | | **16** | **501.17** | **1,762.50** | |

Source: BC Hydro

# APPENDIX C: The BC Hydro 2000/01 Call for Power

With the completion of the 2000/01 BC Hydro Call for Power 23 projects were awarded 20-year EPAs. However, since that time approximately four projects (we believe: Siwash Creek, Tete Creek, Fitzximmons Creek, Tsable River Small Hydro) have officially withdrawn from the process (a withdrawal fee applies) leaving 18 small hydro and one green landfill gas projects. The estimated potential for all the remaining projects was about 900GWh/yr. We note that the price per MWh was also capped in this Call for Power at $55/MWh growing at 0.5CPI annually.

Table 34: Status of 2000/1 Call for Power Projects

| Company | Project | Energy Source | Plant Capacity (MW) | Total Energy (GWh)/yr | Location | Project Updates |
|---|---|---|---|---|---|---|
| Raging River Power & Mining Inc | Raging River Project | water | 1.75 | 13.0 | Port Alice | Connected to grid in 2002 |
| Pacific Cascade Hydro Inc. | HPS Eagle Lake C2 Micro Hydro | water | 0.2 | 1.2 | West Vancouver | Commercial operation in May 2003 |
| Rockford Energy Corp | Brandywine Creek Project | water | 7.0 | 38 to 42 | Whistler | Started producing power October 2003 |
| Renewable Power Corp. | McNair Creek Project | water | 9.8 | 38.0 | Gibsons | Began operation November 3, 2004, owned by MC Hydro Holding Corp. |
| Morehead Valley Hydro | Siwash Creek | water | 0.5 | | Lytton | |
| Synex Energy Resources Ltd. | Mears Creek | water | 3.8 | | Gold River | Constructed in 8 mths; began operating late January 2004 |
| Lorenz Holdings | Tete Creek | water | 2.4 | | Tete Jaune | |
| Eaton Power Corp. | Furry Creek | water | 10.5 | 44.0 | Howe Sound | Owned by Furry Creek Power Ltd.; constructed in 29 mths, began operations early June 2004; final project costs at $18.8M |
| Ledcor Power Inc | Fitzsimmons Creek | water | 3.4 | | Whistler | |
| Innergex Inc. | Tsable River Small Hydro | water | 4.5 | | Courtenay | |
| East Twin Creek Hydro Ltd. | Hystad Creek | water | 6.0 | 20.0 | Valemount | Connected to grid in June 2002; owned by IPP East Twin Creek Hydro Ltd. |
| Canadian Hydro Developers Inc.; Brascan Power | Pingston Creek Small Hydro | water | 30.0 | 198.0 | Revelstoke | Began operation in spring 2003; designed, constructed and co-owned by Brascan and KHD |
| Canadian Hydro Developers Inc.; Brascan Power | Upper Mamquam River Small Hydro | water | 25.0 | | Squamish | $39M project completed in less than 2.5 years |
| Rutherford Creek Power Ltd. | Rutherford Creek Small Hydro | water | 50.0 | | Pemberton | Began operations in May 2004; took less than 2 years to build |
| Epcor Power Development Corporation | Miller Creek Small Hydro | water | 29.0 | | Pemberton | Began operation May 2003 |
| **Total** | | | **183.9** | | | |

Source: BC Hydro - www.bchydro.com/info/ipp/ipp979.html

# APPENDIX D: ENERGY CONVERSION TABLE

| Reference Unit | Conversion Factor | Unit | Unit | Conversion Factor | Reference Unit |
|---|---|---|---|---|---|
| megawatt-hour | 3.6E+27 | attojoule | attojoule | 2.78E-28 | megawatt-hour |
| | 3412141.63313 | BTU (international) | BTU (international) | 2.93E-07 | |
| | 3414425.94972 | BTU (thermochemical) | BTU (thermochemical) | 2.93E-07 | |
| | 859845227.859 | calorie (international) | calorie (international) | 1.16E-09 | |
| | 859845.227859 | calorie (nutritional) | calorie (nutritional) | 1.16E-06 | |
| | 860420650.096 | calorie (thermochemical) | calorie (thermochemical) | 1.16E-09 | |
| | 3.6E+16 | dyne-centimeter | dyne-centimeter | 2.78E-17 | |
| | 2.25E+28 | electron volt | electron volt | 4.45E-29 | |
| | 3.6 | gigajoule | gigajoule | 0.277777778 | |
| | 8.604206500E-10 | gigaton | gigaton | 1162222222 | |
| | 0.001 | gigawatt-hour | gigawatt-hour | 1000 | |
| | 36709783668300 | gram force-centimeter | gram force-centimeter | 2.72E-14 | |
| | 367097836683 | gram force-meter | gram force-meter | 2.72E-12 | |
| megawatt-hour | 1341.02209 | horsepower-hour | horsepower-hour | 0.0007457 | megawatt-hour |
| | 509802957596 | inch-ounce | inch-ounce | 1.96E-12 | |
| | 31862684849.8 | inch-pound | inch-pound | 3.14E-11 | |
| | 3600000000 | joule | joule | 2.78E-10 | |
| | 859845.227859 | kilocalorie (international) | kilocalorie (international) | 1.16E-06 | |
| | 860420.650096 | kilocalorie (thermochemical) | kilocalorie (thermochemical) | 1.16E-06 | |
| | 2.25E+25 | kiloelectron volt | kiloelectron volt | 4.45E-26 | |
| | 36709783668.3 | kilogram force-centimeter | kilogram force-centimeter | 2.72E-11 | |
| | 367097836.683 | kilogram force-meter | kilogram force-meter | 2.72E-09 | |
| | 3600000 | kilojoule | kilojoule | 2.78E-07 | |
| | 0.000860420000 | kiloton | kiloton | 1162.222222 | |
| | 1000 | kilowatt-hour | kilowatt-hour | 0.001 | |
| | 3600000 | kilowatt-second | kilowatt-second | 2.78E-07 | |
| | 3412.14163313 | MBTU | MBTU | 0.000293071 | |
| | 2.25E+22 | megaelectron volt | megaelectron volt | 4.45E-23 | |
| megawatt-hour | 3600 | megajoule | megajoule | 0.000277778 | megawatt-hour |
| | 8.60420650096E-7 | megaton | megaton | 1162222.222 | |
| | 1 | megawatt-hour | megawatt-hour | 1 | |
| | 367097836.683 | meter-kilopond | meter-kilopond | 2.72E-09 | |
| | 3.6E+15 | microjoule | microjoule | 2.78E-16 | |
| | 3.6E+12 | millijoule | millijoule | 2.78E-13 | |
| | 3.6E+18 | nanojoule | nanojoule | 2.78E-19 | |
| | 3600000000 | newton-meter | newton-meter | 2.78E-10 | |
| | 34.1214115649 | therm | therm | 0.029307111 | |
| | 34.1214115649 | therm (EC) | therm (EC) | 0.029307111 | |
| | 34.129563407 | therm (US) | therm (US) | 0.029300111 | |
| megawatt-hour | 0.860420650096 | ton (explosives) | ton (explosives) | 1.162222222 | megawatt-hour |
| | 284.345136094 | ton-hour (refrigeration) | ton-hour (refrigeration) | 0.003516853 | |
| | 1000000 | watt-hour | watt-hour | 1.00E-06 | |
| | 3600000000 | watt-second | watt-second | 2.78E-10 | |

Source: Online.unitconverterpro.com

# APPENDIX E: RUN-OF-RIVER GLOSSARY

| | Term | Definition |
|---|---|---|
| **A** | | |
| | Alternating current (AC) | Electrical current that continually reverses direction of flow. The frequency at which it reverses is measured in cycles-per-second, or Hertz (Hz). The magnitude of the current itself is measured in amps (A). |
| | Alternative fuels | Other fuels that can be substituted for the fuel in use. In the case of natural gas, the most common alternative fuels are distillate fuel oils, residual fuel oils, coal and wood. |
| | Ambient | Natural condition of the environment at any given time. |
| | Ampere (A) | A measure of electric current; one A of current represents one coulomb of electrical charge moving past a specific point in one second (1 C/s = 1 A). |
| | Ampere-hour (Ah) | A unit of for the quantity of electricity obtained by integrating current flow in amperes over the time in hours for its flow; used as a measure of battery capacity. |
| | Amplitude | The maximum extent or magnitude of a vibration or other oscillating phenomenon from the equilibrium position or average value. |
| | Attenuator | A device that reduces the amplitude of a vibration or other oscillating phenomenon. |
| **B** | | |
| | Baseload Plants | Electricity-generating units that are operated to meet the constant or minimum load on the system. The cost of energy from such units is usually the lowest available to the system. |
| | Biodiesel | Biodegradable transportation fuel for use in diesel engines that is produced from biomass (organically derived fats or oils). |
| | Biodiversity | Refers to the variety of ecosystems and animal, bird, fish and plant species. |
| | Bioenergy | Useful renewable energy produced from organic matter. Organic matter may be directly used as a fuel or processed into liquids and gases. |
| | Biofuels | Liquid fuels, such as ethanol and biodiesel, made from biomass. These fuels can be used in their pure form or blended with gasolines. |
| | Biomass | Organic materials containing stored chemical energy. Includes forest residues, agricultural crops and wastes, wood and wood wastes, livestock wastes, animal wastes, fast-growing trees and plants, and municipal and industrial wastes. |
| | Biomass fuel | Liquid, solid or gas fuel produced by conversion of biomass. |
| | Biopower | Use of biomass to generate electricity or industrial heat and steam. |
| | BTU | British thermal unit. The quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit at standard conditions. (Equal to 252 calories.) One Watt hour equals 3,413 BTU. |
| **C** | | |
| | Capacity (electric) | The maximum volume of power that can be produced or delivered under specified conditions by a generator or system, measured on an instantaneous basis, usually expressed in megawatts |
| | Capacity Factor | Capacity factor is the ratio of the actual energy produced in a given period, to the hypothetical maximum possible, i.e. running full time at rated power; the percentage of the maximum possible power generated by the unit |
| | Capacity peaking | The capacity of facilities or equipment normally used to supply incremental gas or electricity under extreme demand conditions. Peaking capacity is generally available for a limited number of hours per day at a maximum rate |
| | Catchment | The catching or collecting of water, especially rainfall or reservoir or other basin for catching water. |
| | Clean energy | Energy from renewable sources (e.g. wind, solar, hydropower). |
| | Climate change | Term used to describe the view that the earth's temperature and climate will change, in part, due to the buildup of greenhouse gas emissions from human activities. |
| | Co-firing | Practice of introducing biomass into the boilers of coal-fired power plants. |
| | Cogeneration | Production of electricity and useful thermal energy (steam) from a common fuel source, such as natural gas. |
| | Combined cycle | Two or more generation processes operating in parallel, so as to increase the energy output from a power system. In a combined-cycle power plant, the waste heat from a gas turbine provides heat for a steam turbine. |
| | Cross axis tidal turbine | A configuration of tidal stream turbine rotor that rotates such that blades move around an axis perpendicular to the flow. |
| | Cubic meter per second (Cumecs) | A measurement of water flow representing one cubic metre of water moving past a given point in oone second. |
| | Cumulative effects | Changes to the environment caused by an activity in combination with other past, present and reasonably foreseeable human activities. |
| | Cumulative impact | The sum total of all effects of multiple projects or land uses. |
| **D** | | |
| | Dam | A concrete or earthen barrier constructed across a river and designed to control water flow or create a reservoir. |
| | Diversion reach | The section of river in a run-ofriver hydropower project between the intake to the penstocks and the tailrace. The diversion reach is the river section with reduced water flows. |
| | DOE | US Department of Energy |
| **E** | | |
| | Efficiency | The ratio of the useful energy output of a machine or other energy-converting plant to the energy input. |
| | Electricity Purchase Agreement (EPA) | 25-year agreement between BC Hydro and an Independent Power Producer that describes the terms under which BC Hydro will purchase electricity. |
| | Energy output | The annual energy output is estimated using the Capacity Factor (CF) as follows: Energy (kWh/year) = P (kW) x CF x 8760 |
| | Environmental assessments | Planning and decision-making tool used by industry and regulators to identify the environmental impacts and costs of proposed electricity projects, and potential solutions. Power companies are potentially subject to environmental assessments for new power projects or changes to existing facilities |

| | Term | Definition |
|---|---|---|
| **F** | | |
| | Feedstock | Any material converted to another form or product. |
| | Firm energy | The amount of energy that can be generated given the region's worst historical water conditions. It is energy produced on a guaranteed basis. |
| | Flow rate (Q) | The volume of water passing per second, measured in m3/sec. For small projects, the flow rate may also be expressed in litres/second or 1 m3/sec. |
| **G** | | |
| | GHG | Greenhouse gas emissions |
| | Gigawatt (GW) | A measurement of power equal to a thousand million Watts. |
| | Gigawatt-hour (GWh) | A measurement of energy. One Gigawatt-hour is equal to one Gigawatt being used for a period of one hour, or one Megawatt being used for 1000 hours. |
| | Green energy | Energy that is renewable and has low environmental impacts. Green energy is often certifi ed according to specifi c criteria, e.g. EcoLogo criteria (see www.environmentalchoice.com). |
| | Greenhouse effect | The warming of the Earth's surface caused by the presence of carbon dioxide and other gases in the atmosphere that trap the heat of the sun. |
| | Greenhouse gases | Gases that trap heat near the Earth's surface. These include carbon dioxide, methane, nitrous oxide and water vapor. These gases occur through natural processes (such as ocean currents, cloud cover, volcanoes) and human activities (such as the burning of fossil fuels). |
| | Grid | Network of high-voltage transmission lines for distributing power to customers. |
| | Grid-connected | An energy producing system connected to the utility transmission grid. Also called Grid tied. |
| | Gross head | The maximum available vertical fall in the water, from the upstream level to the downstream level |
| | Groundwater | Water located underground, in the cracks and spaces in soil, sand and rock. |
| **H** | | |
| | HADD | Harmful alteration, disruption or destruction. Refers to temporary or permanent negative changes to fish habitat under the Federal Fisheries Act. |
| | Headpond | Area flooded upstream of a small dam on a river to ensure sufficient flow at the penstock. |
| | Hydrocarbon | An organic compound containing only hydrogen and carbon. There are hundreds of these compounds and they may occur as gases, liquids or solids. |
| | Hydroelectric project | The complete development of a hydroelectric power site, including dams, reservoirs, transmission lines, and accessories needed for the maintenance and operation of the powerhouse and any other hydroelectric plant support facilities. |
| **I** | | |
| | IEA | International Energy Association |
| | Independent Power Producer (IPP) | Any corporation or entity potentially eligible for an electricity purchase agreement with BC Hydro. |
| | Installed capacity | Amount of power that can be generated at a given moment if all power plants are running at the same time at full capacity |
| | Intake | The entrance to a turbine at a dam, diversion works, or pumping station. |
| **J** | | |
| | Joule (J) | The energy conveyed by one Watt of power for one second, unit of energy equal to 1/3600 kilowatt-hours. |
| **K** | | |
| | Kilowatt (kW) | A unit of electrical power, one thousand Watts. |
| | Kilowatt-hour (kWh) | The amount of energy that derives from a power of one thousand Watts acting over a period of 1 hour. The kWh is a unit of energy. 1 kWh=3600 kJ. |
| **L** | | |
| | Load | The simultaneous demand of all customers required at any specified point in an electric power system. |
| | Load factor | Ratio of the amount of electricity used during a specific time period to the maximum possible use during that period, expressed as a percentage. |
| **M** | | |
| | Megawatt (MW) | Energy sufficient to power 500 homes. |
| | Megawatt-hour (MWh) | A measurement of power with respect to time (i.e. energy). One megawatt-hour is equal to one megawatt being used for a period of one hour, or one kilowatt being used for 1000 hours. |
| | Mid-C pricing | The Mid-Columbia hub is a source of price disovery for power traders in the Northwest US. The NYMEX provides financially settled futures contract based on the average peak day price for the electricity market hub consisting of the non-federal dams along the mid-Columbia River in Washington state. (Power plants and connected facilities are connected by a 230-kilovolt transmission system and 13 transmission paths into and out of the hub) |
| **N** | | |
| | National Energy Board (NEB) | The federal regulatory agency in Canada that authorizes oil, natural gas, and electricity exports; certifies interprovincial and international pipelines, and designated interprovincial and international power lines; and sets tolls and tariffs for oil and gas pipelines under federal jurisdiction. |
| | Net head | The actual head seen by a turbine will be slightly less than the gross head due to losses incurred when transferring the water into and away from the machine. |
| | Non-renewable resources | Natural resources that cannot be replaced after they have been consumed. This term applies particularly to fossil fuels such as coal, oil and natural gas, but also applies to other mineral resources found in the Earth's crust. |
| | NREL | National Renewable Energy Lab in the US |

| | Term | Definition |
|---|---|---|
| **O** | | |
| | Off peak | A period of relatively low demand for electrical energy, such as the middle of the night. |
| | O&M Costs | Operation and maintenance costs. |
| | Ontario Energy Board (OEB) | A regulatory tribunal that has regulatory oversight of natural gas and electricity matters in the province of Ontario and also provides advice on energy matters referred to it by the Government of Ontario. |
| **P** | | |
| | Peaking Plants | Electricity generating plants that are operated to meet the peak or maximum load on the system. The cost of energy from such plants is usually higher than from baseload plants. |
| | Penstock | Pipe that brings water from the river to power turbines located at a lower elevation. |
| | Power | The energy converted per second, i.e. the rate of work being done, measured in watts (where 1watt = 1 Joule/sec. and 1 kilowatt = 1000 watts). The power available is proportional to the product of head and flow rate. |
| | Powerhouse | A building that contains turbines. |
| | Public interest | Usually intended to mean the interest of the public generally as opposed to the interest of an individual or company. |
| | PUC | Public Utility Commission, a state agency which regulates utilities. In some areas known as Public Service Commission (PSC). |
| **R** | | |
| | Renewable energy | Naturally occurring energy sources that are continually replenished. Examples of renewable energy are wind, solar and water. |
| | RECs (renewable Energy Certificates) | The associated benefits of environmental attributes created by a reduction in carbon, mercury, nitrogen and sulphur emissions in comparison with hydrocarbon based power generation. A Renewable Energy Certificate (REC) represents beneficial ownership of the environmental attributes of low-impact renewable energy. These certificates are accumulated, accounted for and transferred separately from the supply of electricity. This allows consumers to purchase electricity and RECs from separate organizations. RECs are purchased annually to offset the buyers' indirect emissions associated with hydrocarbon based power generation. In the United States, RECs are also known as Green Tags. |
| | Renewable Portfolio Standards Program (RPS) | A policy that requires those who sell electricity to have a certain percentage of renewable power in their mix. |
| | Riparian | Pertaining to the banks of a stream. Often used to refer to plant communities and species infl uenced and sustained by nearby water. |
| | Run-off | The amount of precipitation appearing in surface streams, rivers and lakes; defined as the depth to which a drainage area would be covered if all the run-off for a given period of time were uniformly distributed over it. It is also that part of precipitation, snow melt or irrigation water that runs off the land into streams or other surface water. |
| | Run-of-River | A type of hydropower project with little or no reservoir storage capacity. Power is derived from only the river's natural flow. |
| **S** | | |
| | Small hydro | The threshold between small and large hydro is not well defi ned, but small hydro projects generally have a generating capacity of less than 50 megawatts. |
| | Species at Risk | Species designated as threatened, endangered, or 'of concern' by the provincial and/or federal governments. |
| | Stakeholders | People with an interest in industry activities that affect them. They may include nearby landowners, Aboriginal communities, recreational land users, other industries, environmental groups, governments and regulators. |
| | Substation | An electrical facility where the voltage of incoming and outgoing circuits is changed and controlled |
| | Sustainable | Ecosystem condition in which biodiversity, renewability and resource productivity are maintained over time. |
| | Sustainable development | Development that meets the needs of the present without compromising the ability of future generations to meet their own needs (as defined by United Nations World Commission on Environment and Development). |
| **T** | | |
| | Tailrace | Short man-made channel between the powerhouse (that contains the turbines) and the river to which diverted water is returned. |
| | Transmission line | The wires (usually overhead, but sometimes buried) that convey electricity from its point of production to population centers. |
| | Transmission capacity | The maximum amount of electricity that can be transmitted through a particular set of power lines. |
| | Turbine | A bladed, rotating engine activated by the reaction or impulse, or both, of a directed current of fluid. In electric power applications, such as geothermal plants, the turbine is attached to and spins a generator to produce electricity. |
| | Turbine (water) | A rotary engine that converts power from moving water into electric energy. |
| **W** | | |
| | Water Licence | A licence granted by the Province of BC's water comptroller that allows for the diversion, use and/or storage of a predetermined quantity of surface water. Water licences are currently granted for a renewable term of 40 years, and were formerly granted in perpetuity. |
| | Watershed | An entire drainage basin including all living and nonliving components of the system. |
| | Watt (W) | The unit of electrical power commonly used to define the electricity consumption of an appliance. The power developed when a current of one ampere flows through a potential difference of one volt; 1/746 of a horsepower. 1 Watt = 1 Joule/s. |
| | Watt hour (Wh) | A unit of energy equal to one Watt of power being used for one hour. |
| | Weir | A dam in a river to stop and raise the water, for the purpose of conducting it to a mill, forming a fishpond, or the like. When uncontrolled, the weir is termed a fixed-crest weir. Other types of weirs include broad-crested, sharp-crested, drowned, and submerged. |

Source: BC Hydro, US DOE, Centre for Energy

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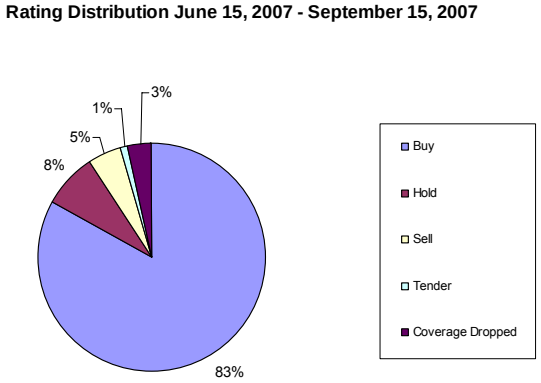


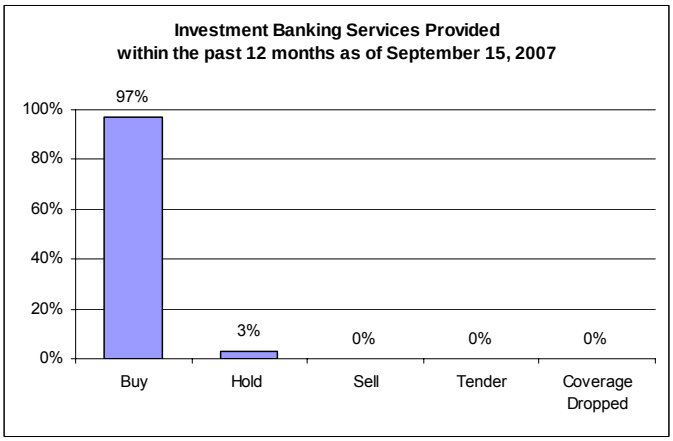


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