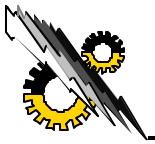

Joint Industry Electricity Steering Committee

BRITISH COLUMBIA UTILITIES COMMISSION

ORDER G-30-03

IN THE MATTER OF THE VANCOUVER ISLAND ENERGY CORPORATION CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY APPLICATION FOR THE VANCOUVER ISLAND GENERATION PROJECT

Intervenor Final Argument Of The Joint Industry Electricity Steering Committee

July 22, 2003

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SUMMARY

The Joint Industry Electricity Steering Committee (JIESC) recommends that the British Columbia Utilities Commission (BCUC) deny the request of the Vancouver Island Energy Corporation (VIEC/BC Hydro) for a Certificate of Public Convenience and Necessity (CPCN) for the proposed 265 megawatt electric power generating facility on Vancouver Island (VIGP). This recommendation results from the following assessment of the evidence:

- The cost of the power from VIGP is too expensive. When estimated costs are adjusted for the reality of peaking plant operation, current forward prices for natural gas, a reasonable capital cost structure, and an on-Island toll for gas transportation, the estimated cost of power produced by VIGP is $127.35 per megawatt in 2007/2008. This is 3.6 times the cost of power delivered to industrial customers under current tariffs.

Approving VIGP will be a costly decision borne by all customers. Should the project proceed the impact will extend far beyond Vancouver Island. With postage stamp rates throughout the province all customers will be affected. These include JIESC members whose businesses are dependent on the competitive power prices that now exist in BC. This is a competitive advantage that all of us, BC Hydro, the BCUC, and BC Hydro's customers must work hard to preserve.

- There are better ways to manage future power demand. The power shortage on Vancouver Island, after the retirement of the DC lines, is limited to a few hours per day during cold winter periods. This means that, in addition to base-load generation, there are load management and peak generation alternatives that would be much less expensive, and which could be promptly implemented. A program to manage load that includes appropriate compensation to participants should be one element of BC Hydro's plan to meet the electric power requirements on Vancouver Island.

- There are multiple lower cost options. Besides the possible expedited approval and construction of the twin 230 kv southern crossing, there are a number of options that have been identified (BC Hydro, NorskeCanada, Hillsborough Resources, Green Island Energy, and Maxim Power) totaling 618 megawatts that, we believe, are lower cost than VIGP. The JIESC does not wish to express a preference for one project over the other. However the JIESC notes that despite the potential to provide the necessary power at lower cost than

VIGP, VIEC/BC Hydro has opted to discount these projects, and others, as being too uncertain to consider seriously as an option to VIGP.

- There likely are economic ways to extend the life of existing assets. There is the opportunity to extend the life of the DC lines for several more years at a reasonable cost. VIEC/BC Hydro testimony was that it would be a waste of money since the DC lines will have to be replaced in any event. Since the annual 6% debt financing cost of the $700 million (Including the pipe-line) project, is over $40 million per year, extending the life of the DC line would appear to be a potentially attractive option.

- The JIESC urges the BCUC to eliminate the conflict of interest that will exist in a Call for Tenders. VIEC/BC Hydro's proposal to be awarded a CPCN conditioned on a Call for Tenders (CFT) for generating capacity in competition with their Vancouver Island plant should not be accepted. We are concerned that BC Hydro will bring a bias to the management of any CFT process that will make it very difficult for proponents to be confident of a fair evaluation. BC Hydro's bias towards VIGP is illustrated in VIEC/BC Hydro's final argument in paragraphs 204 and 205 where VIEC/BC Hydro suggests that no proponent will be able to compete given the advanced stage of VIGP. Further, we are not convinced that an independent monitor or even the active participation of the BCUC could eliminate this appearance of institutional bias.

The BCUC must consider this project from a very long range perspective. If built, VIGP would have a service life of many decades. Keeping energy costs under control requires diversification of energy sources. Just as any prudent investor would reduce risk by investing in several options rather than trying to pick the one best company for investment, reducing risk requires BC Hydro to diversify its power generation sources. Constructing VIGP ties the electric power supply on Vancouver Island to natural gas, a commodity whose price is determined by supply and demand forces throughout North America. The media reports introduced by the JIESC (see Exhibits 29 in their entirety) highlight that the power industry is reconsidering using gas-fired generation in future projects for a number of reasons, including increasing gas prices, increasing gas price volatility and concerns regarding the security and availability of natural gas supplies. A similar sentiment is expressed by the National Energy Board in its report entitled *Canada's Energy Future* filed by VIEC/BC Hydro in its response to BCUC IR 13.1 and 13.2 (see p. 41). We believe alternatives to this project including both generation and transmission should be thoroughly investigated through a CFT process.

INTRODUCTION

The JIESC has reviewed VIEC/BC Hydro's final argument and offers the following comments. While these comments deal specifically with concerns of the JIESC, the lack of any comment discussing or responding to any issue or comment contained in VIEC/BC Hydro's final argument should not be considered to be an acceptance or endorsement of either the evidence filed with the BCUC, the Application, or VIEC/BC Hydro's final argument, either in whole or in part.

The Joint Industry Electricity Steering Committee (JIESC) represents the major industrial users of purchased power that are BC Hydro customers. While not all our members take delivery at transmission voltage, our focus is the interests of transmission customers that purchase power under RS 1821 and other related tariffs. JIESC members purchase approximately 80% of the power sold to this customer class. Member companies are actively engaged in the manufacture of pulp and paper, mining and processing, electrochemical production, and other miscellaneous activities that are electric power intensive. Total employment in member company power intensive operations is approximately 15,000. The member companies are listed below:

JIESC MEMBER COMPANIES

B. C. Chemicals
**Boliden Westmin Resources
Canadian Forest Products Ltd.
Cariboo Pulp and Paper Co.
*Continental Lime Ltd.
Council of Forest Industries
Elk Valley Coal Corporation
ERCO Worldwide
Eurocan Pulp and Paper
Highland Valley Copper
**Homestake Canada Inc.
Howe Sound Pulp and Paper
Imperial Metals Corp.
**Luscar Limited
Methanex/Pacific Ammonia
NorskeCanada
Northgate Exploration Ltd (Kemess)
Pope and Talbot
Quesnel River Pulp
Scott Paper Ltd.
Taseko Mines (Gibralter)
Teck-Cominco Ltd.
*Texada Quarrying Ltd.
The Mining Association of BC
Thompson Creek Mining
West Fraser Timber Co.
*Western Industrial Clay Products
Westroc Inc.
Weyerhaeuser Company Ltd.
**Wheaton River Minerals Ltd.

Nexen Chemicals

*Not at transmission voltage. **Not connected to the grid.

The cost of electric power is not a small item to these companies. The mining sector requires electric power for material handling, size reduction, and pumping and processing. Typical power cost in a copper mine and concentrator would amount to 9¢ per pound or about 14% of typical production costs in BC.

In the pulp and paper sector, power consumption varies greatly with product line. Bleached and unbleached kraft pulp products are less power intensive and also provide a greater opportunity for internal cogeneration than newsprint and bleached chemi-thermo-mechanical pulp (BCTMP). The power intensive grades, newsprint and BCTMP represent about 40% of BC's pulp and paper production. Electric power consumption for these grades is typically 2500 kwh per tonne. At current BC Hydro rates for transmission customers, this represents about $90 per tonne or approximately 20% of newsprint production costs in BC.

The sector which is most dependent on electric power is the electro-chemicals where as much as 75% of the production cost results from the purchase of the necessary electric power. The electric power is used for conversion of sodium chloride into chlorine, caustic soda, and sodium chlorate.

For JIESC members, maintaining the competitive advantage now enjoyed by BC is essential if their businesses are to continue to exist and provide jobs and economic activity for British Columbia. While current prices are important, so too is confidence that effective cost based regulation by the BC Utilities Commission will provide stable and predictable rates for electric power over the long term.

Since the plan for constructing VIGP seemed likely to have an adverse impact on rates for industrial customers, the JIESC elected to become an active intervenor in this proceeding. Besides attending the hearing and cross examining witnesses, the JIESC also provided an expert witness, Mr. Sheldon Fulton, to provide testimony regarding natural gas prices and price risk. The JIESC appreciates the opportunity to participate in this process and is hopeful that it has contributed input that the BCUC will find helpful.

COST OF ELECTRIC POWER FROM VIGP

The direct evidence of Mr. Sheldon Fulton (Exhibits 29C and 29G) raises serious questions regarding gas prices, gas price volatility, and the resulting projected utilization rate in VIEC/BC Hydro's analysis of VIGP operating costs. Reproduced below are several paragraphs from the summary in his filed testimony:

> *In order to operate efficiently and effectively and produce electricity at sustainable prices, the VIGP must be able to respond to the short term variations in both gas prices and electricity prices. An assumption of a levelized gas price for the twenty-five years of operation ignores the cyclical, seasonal, and volatility characteristics inherent in the North American and regional gas markets and the negative impacts such characteristics have on the generating cost of the VIGP.*
>
> *Additionally, it is not sufficient to assume that the price of gas and the price electricity are so inter-related that the absolute level of gas prices is not relevant to the economics of the VIGP. Further, it is also not sufficient to assume that the time-of-day, day of the week, and week of the year can be ignored as to their impact on plant economics.*
>
> *The seasonal, cyclical and long and short term price volatility of gas must also be considered in the context of generating electricity in market dominated by hydro capacity. The price economics of the VIGP in competition with the Mid-C heavy and light electricity markets indicate that the plant's operation would be relegated to peak markets.*
>
> *Based on the analysis of the cost structure for the VIGP as set out in the Application for the 2007/08 year, the current natural gas market, tradeable on NYMEX out to 2009 indicates that the gas price assumption for that year is understated by 25% and as such the variable cost is $10.00/MWh lower than current gas market realities. The forward electricity market realities in the PNW as represented by the Mid-C market indicate that the VIGP would not be able to generate electricity at prices that would cover the gas costs for most off-peak hours. It is therefore probable and prudent that the plant will be operated as a peaking facility, as is the case for most commercial CCGTs that do not receive locational subsidies for operation in off-peak periods.*
>
> *Operation of the plant as a 5000 hour per year peaking facility increases the capital cost per megawatt of output by $20.00/MWh in 2007/08. The combined effect of peaking operation and current 2007/08 Sumas gas prices increases the cost for the facility from the projected $76.70/MWh to $107.75/MWh or 40% higher than determined by the Applicant There may however exist other operational reasons for the VIGP, but its resultant cost structure as a peaking facility makes it uneconomic to operate as a base-load facility based on electricity markets in BC and the PNW.*

In arriving at the estimated cost of $107.75 per MWh, Mr. Fulton has only made adjustments for a more realistic natural gas price and plant utilization that reflects volatility of gas and electric prices in the Pacific Northwest. The estimated cost still does not include an on-island gas transportation toll. Also, the estimated cost is based on a capital cost that assumes 100% debt

financing at 6% interest. The on-Island gas transportation toll will add between $2-4 per MWh. Assuming a minimal 20% equity at the required pretax return of 15.25% would add another $22 million per year or $16.60 per MWh. Using the mid-range $3.00 per MWh as an estimate for the on-Island toll, a reasonable estimate of the cost of power from VIGP would be $107.75 + $3.00 + $16.60 = $127.35 per MWh. This represents the cost of the power at the substation adjacent to VIGP and includes no allowance for transmission to customers. This cost estimate is 3.6 times higher than the cost of electric power delivered to industrial customers under current tariffs.

Mr. Fulton's analysis is based on the estimates provided in the original Application as further documented in subsequent IR's. Late in the hearing process VIEC/BC Hydro presented a revised cost estimate that suggested the real levelized estimated cost of power produced by VIGP had decreased to $59.60 per MWh from the real levelized estimated cost of $65.00 in the original Application. The principal cause of the revision was an increase in the projected cost of natural gas in US dollars which was more than offset by favorable changes in the exchange rate. (The US/Canadian exchange rate has since become less favorable) This 10% estimated cost reduction only further serves to demonstrate that fuel price volatility will certainly have a significant impact on the economics of VIGP. We have not used the VIEC/BC Hydro later forecast since Mr. Fulton's evidence updated the gas price forecast used in the original Application.

VIEC/BC Hydro claims they have performed a sensitivity analysis using higher gas prices and the VIGP project performs very well. In paragraph 126 of final argument, VIEC/BC Hydro states:

> *The sensitivity analysis indicates that VIGP performs well under high gas prices. While this may seem counterintuitive, it is consistent with the notion that efficient CCGT's become more economic relative to other less efficient gas-fired resources.*

As the only less efficient, and significant gas fired resource operated by BC Hydro is Burrard Thermal, the crux of the sensitivity analysis, which we agree is correct, is that it is cheaper to operate VIGP than Burrard Thermal at high gas prices. That argument provides little comfort for customers that will see the high gas costs flow through to higher prices under either scenario. With a heat rate of around 7,000 gigajoules/kwh, when gas costs go up $5.00 per gigajoule, the cost of power will from VIGP will increase $35.00 per MWh, or in direct proportion to the gas price. No "portfolio analysis" or "sensitivity analysis" can lead to any other conclusion.

Cost of Capital

The largest revision we propose with respect to the estimated cost of the power produced at VIGP relates to the cost of capital. In the analysis above we argue that using 100% debt at a cost of 6% is not the appropriate way to assign a cost of capital to VIGP. In her oral testimony, Ms Hemmingsen indicated that 6% is the cost of debt for VIEC/BC Hydro and financing the project would have the effect of increasing the debt of BC Hydro by the capital cost of the project. Therefore the cost of the output from VIGP should be evaluated using 6% as the cost of capital. BC Hydro's approach has some justification as it appropriately reflects the incremental costs to BC Hydro of raising additional capital since it is not likely to have an equity issue. However, BC Hydro's approach ignores the reality that no private entity could borrow funds in the credit markets without providing equity. The equity is the money "at risk" that protects the lender and creates the environment where the lender is willing to accept low, fixed rates. If VIGP were divorced from VIEC/BC Hydro as an independent entity and had a long term contract for the sale of electric power to BC Hydro under which BC Hydro agreed to assume all gas price risk, it would still be impossible to obtain 100% debt financing at a reasonable rate. It is our contention that, in fact, the financing of VIGP will effectively absorb some of BC Hydro's existing equity and that the cost of that equity should be reflected in the cost of VIGP. Further, given the high operating cost for VIGP and its expected low operating rate, we believe VIGP would be viewed as a very risky venture by prospective creditors. This assessment is further supported by the documented financial problems associated with merchant generating plants throughout North America.

BC Hydro is a regulated utility with cost based rates and the risks associated with gas prices and volatility will flow through to customers. In effect BC Hydro, if it is not putting its own equity at risk, is putting customer equity at risk through the potential of lost profits resulting from higher electricity rates during periods of high gas costs. The correct analysis of VIGP requires an equity component in its financing and a rate of return reflective of the cost of equity capital at risk. While the exact percentage of equity and the return required could be the subject of endless debate, we believe our use of 20% equity at a return of 15.25% is much more appropriate than the BC Hydro approach of 100% debt at an interest rate of 6%.

We further submit that the requirement for equity includes both GSX and VIGP. This results in an equity requirement of $140 million. The 15.25% is the rate of return that must be used in calculating VIEC/BC Hydro's return on equity for purposes of setting rates under current

government directives. This is the return used to determine the cost of equity that flows through to customers. It is the appropriate rate of return to use when calculating the cost that will be paid by customers for the power produced by VIGP.

LOAD MANAGEMENT AND PEAKING

As is explained in the Application, the need on Vancouver Island arises because of the expected retirement for "planning purposes" of the existing DC transmission facilities with a rated capacity of 240 megawatts until retirement in 2007. The VIGP is required to replace this transmission capacity. Examination of the load duration curve reveals that operation of the new facility to meet Island peak requirements is required for less than 10% of the hours per year (see evidence Sheldon Fulton, Ex. 29C, p. 29). On cold winter days, as illustrated by slide 21 provided by VIEC/BC Hydro at the pre-hearing workshop, the load will vary through the day by as much as 600 megawatts.

Furthermore, the testimony of VIEC/BC Hydro witnesses indicates that VIEC/BC Hydro has made no effort to explore load management with their customers to reduce the peaks and negate the need for new facilities. The JIESC is of the view that developing the ability of industrial customers to manage load is a possible option that deserves exploring. There are pulp and paper facilities in other jurisdictions that have installed excess pulping capacity and additional storage that allows reductions in load during peak hours without sacrificing total output. With Vancouver Island being one of the most expensive areas to serve, efficient use of transmission infrastructure requires evaluation of such opportunities and their development where economically attractive. For pulp and paper mills to develop such a capability additional investment in capacity and storage facilities would likely be required. It would seem feasible to negotiate an arrangement that would provide compensation to parties interested in managing their load in a manner that would reduce the investment required by BC Hydro.

VIEC/BC Hydro's witness, Dr. Pickel, testified that curtailment was quite unsuccessful in California where customers preferred paying up to $9,000 per MWh rather than curtail. The JIESC would suggest that the customer profile on the Island, with relatively few large industrial users, might very well be a different circumstance than California. It is our firm belief that contracts for load management could be negotiated that would be economically superior to VIGP.

Since the generating capacity needed on Vancouver Island is required for only a few hours per year, the JIESC suggested during the hearing that a peaking facility using distillate would be worthy of evaluation as an option to the proposed VIGP and GSX. In BC, peak demands for both gas and electricity occur in winter months, the precise time when additional generation capacity on Vancouver Island will also be required. As currently proposed VIGP will not have the ability to substitute distillate for natural gas. As explained by VIEC/BC Hydro the ability to burn distillate requires additional investment and introduces other operating and maintenance requirements that are costly. We continue to suggest that the distillate only option is worthy of evaluation. Such an evaluation may be possible through the CFT process.

GENERATION ALTERNATIVES

Through the hearing process the following alternative sources of capacity have been identified:

- BC Hydro's Ladore and Strathcona Generation Stations – 39 MW
- NorskeCanada proposal of 256 MW generation and an additional 108 MW of conservation and demand management
- Green Island Energy's proposal of 105 MW of wood fired generation
- Hillsborough Resources' proposal for 60 MW of coal fired generation
- Maxim Power suggests 50 MW of small cogeneration using natural gas

These proposals represent a total of 618 MW of potential capacity that has not been seriously considered by BC Hydro. Part of the problem has been BC Hydro's reluctance to consider these options on reasonable commercial terms. This has changed somewhat since the issuance of the Energy Policy and subsequent calls for customer based generation and green energy. But in both instances the maximum quantity BC Hydro would buy is stated to be 800 gigawatt hours, which is equivalent to one 100 MW plant operating at near 100% utilization. Besides being a small quantity, BC Hydro has dismissed potential suppliers, such as Hillsborough Resources, for lack of operating experience and financial capability. It is of concern to the JIESC that BC Hydro appears unwilling to engage in a program of contracting with alternative suppliers unless the supplier can guarantee the supply with nearly 100% certainty. We doubt that any independent

supplier will be able to meet the test. While we agree that the performance of an individual supplier may be subject to some uncertainty, the JIESC would suggest that this risk can be greatly reduced by developing a portfolio of suppliers using a diversified mix of resources to provide the electric power. Therefore, onerous performance guarantees should not be required for smaller scale projects in the portfolio intended to replace VIGP.

BC Hydro has also been unwilling to assume the gas price risk for co-generators using natural gas, a risk BC Hydro and its customers obviously bear with VIGP. We would urge the Commission to proceed in a fashion that will result in serious consideration of these and all other cost effective means of meeting the power requirements on Vancouver Island.

TRANSMISSION ALTERNATIVES

Transmission to Vancouver Island has the huge advantage of providing flexibility of supply source. With transmission BC Hydro can dispatch its own resources and buy power from the Northwest US or Alberta and deliver it to the Island. This flexibility will provide a huge real-world cost advantage that is hidden from view VIEC/BCHydro's decision to use gas-fired generation "as a proxy" for the cost of all new generation when comparing portfolios.

Mr. Elton acknowledged that there are different views within BC Hydro regarding the feasibility of maintaining the HVDC system. During the hearing there was no testimony that the HVDC system could not be maintained, only that it was costly and uneconomic to do so. It is our belief that BC Hydro should be required to determine the cost of maintaining the existing system in operation until some reasonable date, say 2010, and compare that option to other options when evaluating how to proceed. Further, that evaluation must include real world price levels and volatility for both natural gas and electric power. With the remaining cost of VIGP and the GSX pipeline at over $600 million, BC Hydro and its rate payers can afford substantial costs to maintain the HVDC system if the effect is to avoid the need to build VIGP and GSX.

It is further submitted that BC Hydro could cost effectively meet the needs of Vancouver Island through the combined strategy of third party generation, load management, maintenance of the HVDC system for two to three years beyond its expected retirement date. During that period of time, BC Hydro could proceed with the design and construction of the 230 Kv transmission line to the Island. It is to be recalled that the NPV analysis provided by VIEC/BC Hydro indicates that

the transmission line will be constructed in the 2008/10 time period in any event. We suggest that the time line simply be moved ahead.

RESPONSE TO APPLICANT'S FINAL ARGUMENT

The following discussion represents a response to specific portions of VIEC/BC Hydro's final argument and specifically, those portions of the argument that discuss the linkage between gas and electricity prices as set out in paragraphs 91 to 127 (pp 34 to 46). For convenience we have referred to the paragraph numbers of VIEC/BC Hydro's final argument accordingly.

VIEC/BC Hydro's final argument continues to maintain that the VIGP will be operated as a baseload facility within the market realities of the gas and electricity markets in the Pacific Northwest. That position appears to be based on the premise that "because the dominant incremental generation in western North America is expected to be natural gas-fired, the cost of generating electricity from combined cycle gas-fired generating stations is expected to establish the market price for electricity" (paragraph 91-pg 34). This statement implies a market-based relationship for operation of VIGP. However, the next nine points of VIEC/BC Hydro's argument tend to contradict that statement.

In paragraph 92 the underlying contention proposed by VIEC/BC Hydro is that older inefficient gas-fired generation acts as the swing supply for the total electric energy production in the WECC and goes on to suggest that California-based generators will establish the price of electricity. However, in paragraph 126 reference is made to Dr. Pickel's evidence "that he expects to see declining gas prices in Western US and Canada gas prices over the next few years, despite the projection that all but 8 percent of the generation additions will be gas-fired and that Dr. Pickel explained that the apparent contradiction arises because a number of more efficient gas-fired units are expected to replace some of the older units, so that increases in total gas consumption are unlikely to be large."

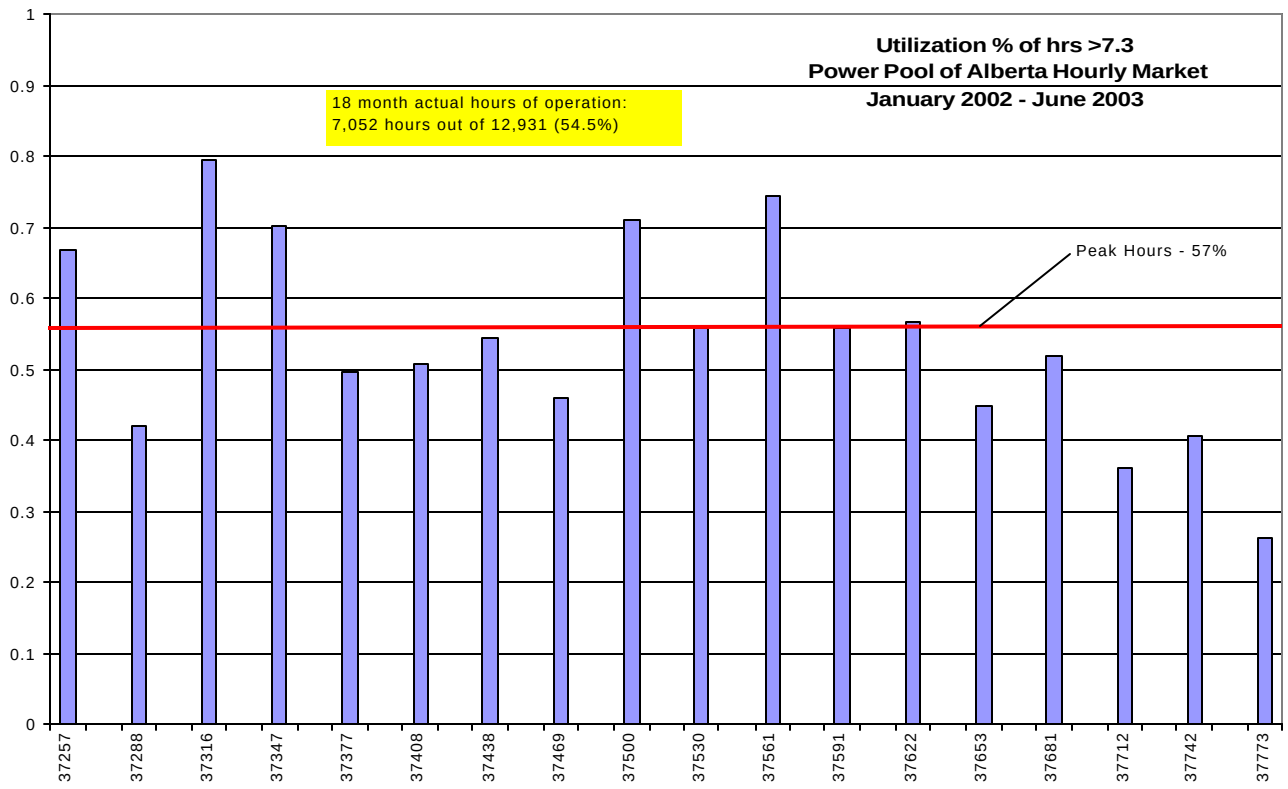
It would seem that both of these events cannot occur – either the less efficient units are going to be displaced by more efficient units which will lead to reduced demands for natural gas and reduced electricity prices arising from improved efficiencies, or the older ones will continue to be at the margin – consuming more natural gas which will result in gas prices increasing. In the first case scenario, the market dynamics would result in the VIGP not operating as a baseload unit when the market price for electricity in off-peak periods was below the unit's heat rate. In the second instance with higher gas prices the assigned operating costs for VIGP are understated.

In paragraph 93 the Alberta market is summarily dismissed by VIEC/BC Hydro as having no relevance to a consideration of the VIGP. Yet Alberta has the highest concentration of gas-based generation in the Pacific Northwest. Moreover, in its report, *Canadian Energy Supply,* at p. 40, the NEB anticipates that Alberta will become the largest market for gas used in electric power generation in Canada. Alberta currently enjoys the least cost supply of short-term gas in North America and is one of the major core production basins and has significant industrial demand for thermal output of gas-based generation. It is difficult to comprehend VIEC/BC Hydro's argument that the Alberta market is not relevant to BC operations. It is even more difficult to understand VIEC/BC Hydro's argument that the California market is so much more relevant than Alberta with respect to the economics of a CCGT located in Canada.

VIEC/BC Hydro's marginalization of Alberta appears to be inconsistent with the transmission inter-connect capacity between Alberta and BC – rated at 1,000MW for import and to the US rated at 2,000MW for import based on BC Hydro's web-site data. This would indicate at least a 50% relative influence of Alberta market as compared to the US PNW markets; and unlike other WECC markets, Alberta's primary electric energy trade is exclusively with BC. These same price differences that drive imports and exports between BC and Alberta will influence the economics of the operation of VIGP.

The analysis of the Alberta market on an hour-by-hour basis presented by Mr. Fulton and as recommended by Dr. Pickel in his June 25 supplemental analysis, indicates that a CCGT with VIGP operating efficiency would operate above the rated heat capacity of 7.3Gj/MWh for only 54.5% of the hours in the Alberta market. (Note: The figures and graphs below were presented as part of Exhibit 29C)

Figure 1 - VIGP-type utilization in the Alberta market



Paragraph 93 of VIEC/BC Hydro's final argument further suggests that "the hourly pattern in Alberta is not driven by trade by a hydroelectric generation area and a gas-fired generation area, so it differs in hourly characteristics from the coastal WECC market." This statement appears to belie VIEC/BC Hydro's notion that gas prices and electricity prices are inextricably linked, in the short term and the long-term even in areas with as high as 43% of generating capacity originating from gas-fired generation. One can only speculate as to why BC Hydro believes that an area that has only 16% of its generating capacity gas-fired and that has enormous hydro reserves to meet peak load requirements, would have electricity prices that exhibit a higher price correlation to gas prices than in Alberta where gas competes with baseload coal-fired generation and hence is much more likely to be the unit at the margin.

Paragraph 94 suggests that use of "the flexibility and storage capability of the hydroelectric system to "store" thermal generation from the VIGP and other sources off-peak" is the most likely operating characteristic for VIGP. The value of the storage capability of a hydro system was acknowledged by Mr. Fulton in his evidence and supported by Ms Farrell in her response to questions by Mr. Bois. It was acknowledged that if the VIGP plant is operated as a baseload facility then there will be significant periods of time during the year when the cost of the gas is greater than the value of the electricity generated. At such times VIEC/BC Hydro indicated that it would continue to operate VIGP and the "loss" incurred would be "stored" in the value of the water in the reservoirs for subsequent sale when electricity prices would be higher. However, that philosophy presumes that the loss can be recovered. It seems that this operating philosophy is akin to purchasing a stock with the hopes that it will increase in value. Regrettably, stocks do not always increase in value. In the case of a stock, the investor loses when the stock declines in value, however, in the case of VIGP; it is the ratepayer that pays for money losing decisions.

If the VIGP is built then VIEC/BC Hydro's operating plan may be a reasonable operating approach for the facility, but the considerations facing the BCUC are aptly described in paragraph 11 of the Applicant's Argument as being, "on the need and desirability of locating new electric generation on Vancouver Island – in particular, the need for VIGP – as well as considering the cost-effectiveness of meeting that need."

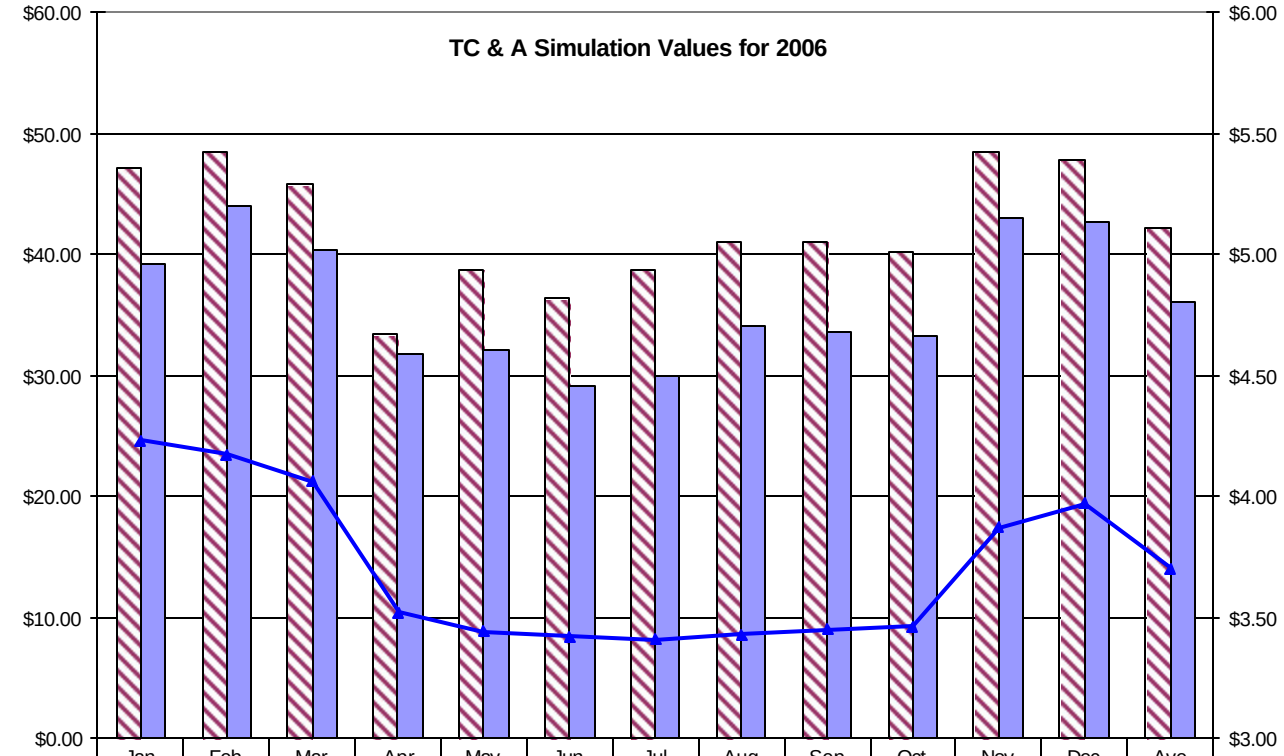
As Mr. Fulton observed, the operation of VIGP in off-peak hours wherein gas prices receive an indirect subsidy through the use of BC Hydro's "storage" capability has to be equivalently considered for all other alternative mechanisms for meeting the capacity shortfall on Vancouver Island. It was further contended that if such a consideration is given to these alternatives then the VIGP proposal is unlikely to be the most cost-effective means of "meeting the need".

VIEC/BC Hydro's argument in paragraph 95 appears to be a direct contradiction of the contention in paragraph 93 for the exclusion of Alberta as an irrelevant example. If BC is "the closest major coastal WECC participant to the gas production areas, gas-fired generation in BC will usually have cheaper incremental gas supplies" (which begs the question as to the geographic location of Alberta in WECC), then why would looking at the Alberta electricity and gas price relationships be of little relevance? Mr. Fulton testified that over the 12,931 hours between January 1, 2002 and June 25, 2003 the analysis of the Alberta market indicated that a

VIGP equivalent efficiency CCGT would operate in only 54.5% of the hours. That in a market which Mr. Engbloom acknowledged in cross-examination was a very liquid market for gas.

An analysis of Mr. Fulton's evidence reveals that a third of Alberta's gas-fired generating capacity comes from inefficient single cycle gas units, yet the marginal prices for electricity are not being set by these units. Prices are being set by coal units, imports of electricity from BC, and by more efficient gas-fired units. The JIESC suggests that VIEC/BC Hydro seems to want its cake and to eat it too; it wants the benefit of low gas prices for economic efficiency, and higher gas prices once transported to California to set the comparative electricity prices and contends that this relationship will result in very high utilization of VIGP and hence justify its existence. But Mr. Fulton's evidence indicates that the market reality for 2002, 2003, and for the foreseeable future of gas and electricity prices out to 2009 is that the relationship suggested by VIEC/BC Hydro has not existed and does not appear to exist for the next 6 years.

Figure 2 - Dr. Pickel's June 25 values for 2006

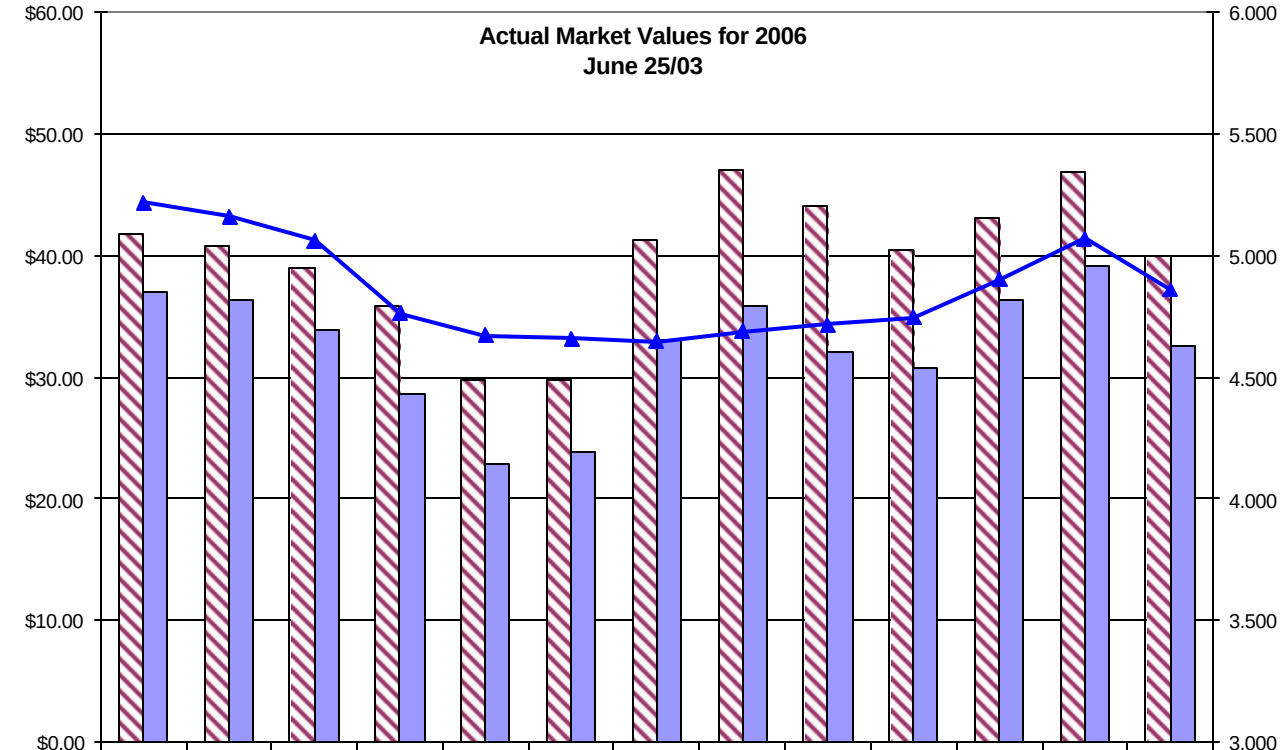


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
HL	$47.05	$48.45	$45.69	$33.32	$38.66	$36.29	$38.64	$41.04	$41.03	$40.20	$48.43	$47.81	$42.22
LL	$39.10	$43.96	$40.30	$31.70	$32.02	$29.16	$29.86	$34.01	$33.63	$33.27	$42.95	$42.69	$36.05
Gas	$4.23	$4.17	$4.06	$3.52	$3.44	$3.42	$3.41	$3.43	$3.45	$3.46	$3.87	$3.97	$3.70

It may be useful to contrive relationships between gas and electricity prices that provide economic justification for VIGP as was undertaken by Dr. Pickel's analysis of June 25. However

this contrived relationship should bear some resemblance to reality as contrasted in Figures 2 and 3. As much as one may "wish" for prices – the market is the market.

Figure 3 - Actual NYMEX and Mid-C prices for June 25



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
HL	$41.78	$40.86	$39.02	$35.81	$29.84	$29.84	$41.32	$47.06	$44.07	$40.40	$43.16	$46.83	$40.00
LL	$37.04	$36.32	$33.93	$28.68	$22.94	$23.90	$32.98	$35.85	$32.02	$30.83	$36.32	$39.19	$32.50
Gas	5.217	5.162	5.062	4.762	4.672	4.658	4.648	4.688	4.718	4.743	4.903	5.068	$4.86

Paragraph 96 refers to the model used by VIEC/BC Hydro. The modeling ascribed to this operational justification for VIGP is just that, a model. A look at Figures 2 and 3 provides a ready explanation for the high operational utilization factor that comes out of the model. The gas prices used by Dr. Pickel in the GE MAPS model for 2006 are much lower than the current NYMEX market for gas. It is quite easy to get a projected high utilization factor for VIGP when one uses low gas prices and high electricity prices, then the utilization factor works out nicely. However, in contrast, Mr. Fulton's evidence, based on actual market data indicates a much lower utilization rate for the VIGP.

It needs to be observed that Dr. Pickel's approach in the GE MAPS model differs from VIEC/BC Hydro's analysis with respect to dispatching the VIGP. While the GE MAPS model is stated to provide a more robust estimate of power prices, it is noteworthy that the current and near term

prices used in that model are quite different than the actual prices quoted in the market. The JIESC suggests that the information contained in the GE MAPS model is of little value in considering the present Application.

Moreover, in both the GE MAPS model and in VIEC/BC Hydro's system simulation model natural gas prices are treated as inputs not outputs. That is, neither model is predicting gas prices and electricity prices. Rather both models use gas prices as an input to the model. No evidence was presented during the hearings as to the forecasting models used by VIEC/BC Hydro to predict gas and electricity prices. If these gas prices are inherently too low, then the result will be higher VIGP utilization, and as evidenced by the gas price curve for 2006 in each of Figures 2 and 3, the gas prices in Figure 2 appear to be too low with respect to the market prices as reflected by NYMEX in Figure 3.

In paragraph 97 VIEC/BC Hydro attempts to discount the evidence of Mr. Fulton by arguing that prices and volatility alone do not matter. Rather, it is the relationship between electricity and gas commodities that will determine whether a plant is dispatched or not. That argument is premised on an economist's explanation of real world events. However, Mr. Fulton's evidence presents how the real world treats gas fired generation and regardless of whether VIEC/BC Hydro likes it or not, it cannot argue that from the premise that "if the real world doesn't match the output of my model, then the real world is wrong, because my model is always right". If only the real world operated in accordance with the models, life would be so much simpler.

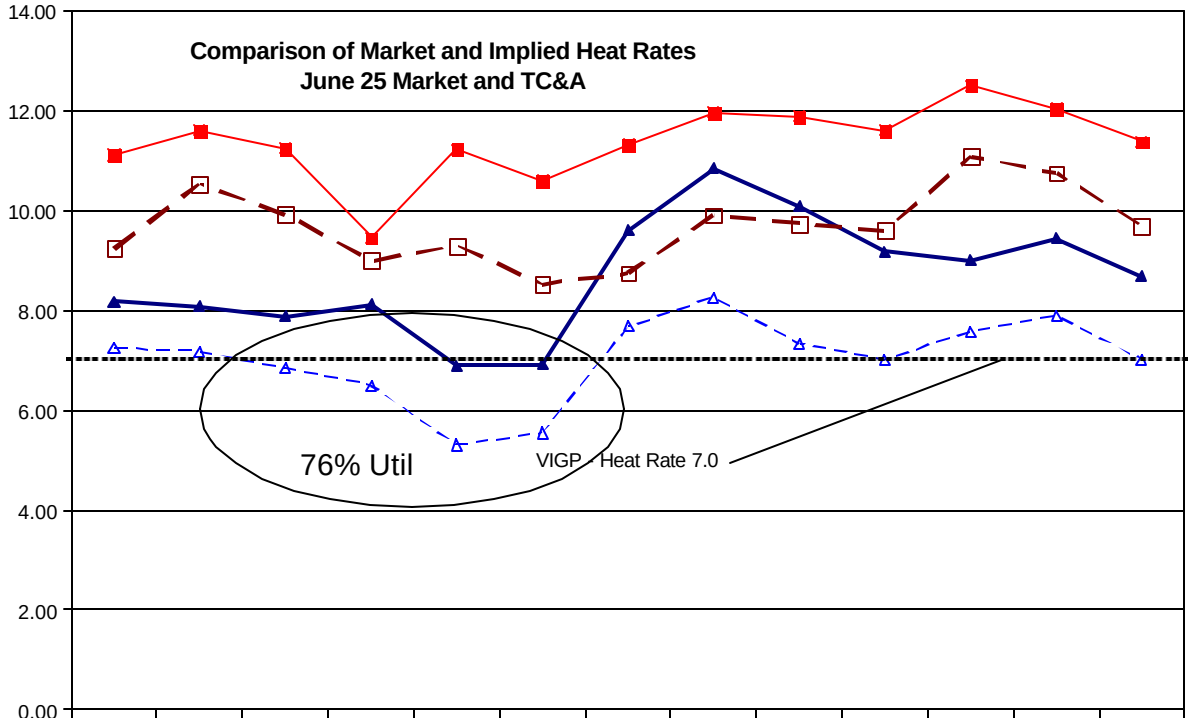
VIEC/BC Hydro's argument in paragraph 93 dismissed Alberta as non-relevant even though it is a real electricity market with real gas prices, real electricity prices trading 100% of all electricity in the province, and has 43% of capacity gas-fired. But because this market only justifies operation of a CCGT of VIGP efficiency for 54.5% of the hours, it is non-relevant. That position is inconsistent with the long term forecast of industry, which sees increase gas fired generation in connection with oil sands recovery, and with the NEB report which sees Alberta becoming the largest market for gas fired generation.

In paragraph 97 VIEC/BC Hydro appears to be ascribing a causal relationship between gas prices and electricity prices that simply does not exist in North America; "neither the price level nor the volatility of the individual commodities alone is what matters. It is how they relate to each other that determines the market heat rate and, thus the dispatch of generation facilities." But the analysis of the Alberta market carried out by Mr. Fulton was based on the actual gas prices and

the actual electricity prices for every hour of the day as determined by a merit-order pricing mechanism as prescribed by Dr. Pickel in the GE-MAPS model. Even using the methodology proposed by Dr. Pickel, Mr. Fulton's evidence is such that VIGP will be utilized only 54.5% of the time.

Paragraph 98 indicates that "Mr. Fulton's calculation of heat rates from forward electricity and gas prices is unsound. VIEC/BC Hydro argues that it is unsound, first because of illiquidity there are large bid/ask spreads in forward price and regional gas price quotations making their use in calculating heat rates unreliable. Second, location is important …" Figure 4 provides the calculated Market Heat Rates from Mid-C and NYMEX forward markets as compared to Dr. Pickel's modeled results. Conveniently the modeled results support high utilization for VIGP, therefore the market must be wrong.

Figure 4 - Resultant comparison of market and imputed heat rates



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
MHR HL	8.18	8.09	7.88	8.12	6.90	6.93	9.61	10.85	10.09	9.20	9.00	9.45	8.69
MHR LL	7.25	7.19	6.85	6.50	5.31	5.55	7.67	8.26	7.33	7.02	7.58	7.90	7.03
TC&A HL	11.12	11.62	11.25	9.47	11.24	10.61	11.33	11.97	11.89	11.62	12.51	12.04	11.39
TC&A LL	9.24	10.54	9.93	9.01	9.31	8.53	8.76	9.92	9.75	9.62	11.10	10.75	9.70

The BCUC is encouraged to remember that despite what models purport to forecast, the market is the market. Mr. Fulton demonstrated that the NYMEX Open Interest for 2006 on June 25,

2003, averaged 1131 contracts or an equivalent flow rate of 400Tjs/day for the year as compared to the VIGP's requirement of 45Tjs/day for baseload operations. That evidence can be interpreted to mean that as at June 25, 2003, a volume at least nine times greater than the VIGP's requirement has already traded for delivery in 2006. As Mr. Fulton indicated, liquidity is a measure of bid/offer spreads and willingness of a market to absorb volumes.

As indicated in Figure 2, Dr. Pickel's gas prices for 2006 average US$3.70/MMBTU. NYMEX prices for 2006 as indicated by Figure 3 average US$4.86/MMBTU. It is difficult to conceive a definition of illiquidity that would suggest or support a bid/offer spread of US$1.16/MMBTU for NYMEX. Mr. Fulton's evidence suggests that current market liquidity quotes to absorb VIGP size volumes are in the US$0.03 to US$0.05/MMBTU range. Using as much as a 6 cent spread for possible illiquidity in gas price still leaves Dr. Pickel's prices US$1.10/MMBTU or 23% below market.

A similar concern is raised with respect Mr. Fulton's use of the Mid-C electricity prices as VIEC/BC Hydro argues that Mid-C prices are too illiquid to represent reality. Yet the prices quoted by Mr. Fulton are for the over the counter market, which prices are regularly quoted by Powerex, as indicative prices for 2006, and at levels at which business is and can be done. These are prices wherein buyers and sellers are prepared to transact. In fact, despite criticizing the use of Mid-C prices by Mr. Fulton, BC Hydro as part of its proposed stepped rate design, (See Exhibit 29K, p. 5) is proposing to use Mid-C prices for determining the cost of new supply as determined by Powerex. A further alternative proposed by BC Hydro is to monitor the trade activity at Mid-C for a one year period and use that as a basis for determining a Tier 2 rate. It seems inconsistent to criticize Mr. Fulton's use of Mid-C as being representative of the market when BC Hydro proposes to use Mid-C to establish Tier 2 pricing in its stepped rate design.

It also needs to be observed that illiquidity is a two-edged sword, in that it cuts to both the buyer and seller in a market. The JIESC submits that VIEC/BC Hydro has used gas and electricity prices that show very favourable market heat rates, and hence justify the economics of the plant. However, the reality of the market is that VIEC/BC Hydro must buy the gas at the offer price and sell the electricity at the bid. If the bid/offer spread is as wide as suggested in paragraph 98, then that would result in a much lower utilization of VIGP than indicated by Mr. Fulton; not better. Mr. Fulton's evidence relating to prices is based on mid-market levels. If the market is illiquid for both gas and electricity then the offer price for gas will be higher, the bid price for electricity lower, and

the resultant market heat rate will be lower than Mr. Fulton's levels (as indicated in Figure 4) not higher as implied in paragraph 98.

Paragraph 99 of VIEC/BC Hydro's argument totally ignores the testimony of Mr. Fulton with respect to calculation of utilization factors that do not consider hourly dispatch. As was demonstrated by Mr. Fulton the utilization rate for CCGTs goes down, not up, when determined on an hourly basis versus time blocks such as for heavy and light load monthly pricing.

No where does Mr. Fulton ascribe an 85.6% utilization to VIGP. This calculation was based on a CCGT located at Sumas attached directly to the main gas transmission network and included a calculation based on July 2003 to June 2004 forward monthly prices as published by Powerex. Based on information published by Powerex, and introduced into evidence by Mr. Fulton, Mr. Fulton determined that operating at an 85.6% utilization, a VIGP like plant, located at or near Sumas, would lose $19.35/MWh versus losing $20.61/MWh operating with full utilization. The implied benefit of operating based on market prices for July 2003 to June 2004 is a saving of $1.30/MWh of output. The 85.6% utilization calculation for 2003/04 and 76% factor set out in Figure 4 are market indications of utilization not Mr. Fulton's modeled values.

Unfortunately the conclusions contained in paragraph 100 are the crux of the differences between using theoretical models and actual market reality. It suggests that VIGP's energy production will be competitive, that VIEC/BC Hydro's estimate of VIGP utilization is therefore reasonable, and as such the "value of the electric energy produced would offset the incremental cost of the capacity". But a look at Figure 4 heat rates as implied by Dr. Pickel's price modeling and for those prices set by the market for 2006, it is both the utilization factor and the level of contributions to non-operating costs that are in question.

Dr. Pickel's average heat rates for 2006 are 11.4 for peak energy and 9.7 for off-peak periods. Based on Mr. Fulton's evidence, these levels are actually closer to 8.7 for peak and 7.0 for off-peak, about 34% lower than Dr. Pickel's values. It is unlikely that at these market heat rates that there would be adequate margins to cover VIGP's fixed costs which the evidence indicates is estimated at $40+/MWh for 2007.

The discussion of gas prices in paragraphs 119 to 125 has the crux of the Applicant's argument summarized in paragraph 124. "Projects like the VIGP will be protected against short term price volatility because their gas supply will be managed by mixes of gas purchase contracts

specifically designed to mitigate this risk." Use of such a risk mitigation strategy is both commendable and recommended given the high price volatility of short term gas markets. However it is wrongly interpreted with respect to the normal operating procedures for CCGTs.

If a CCGT has acquired a longer term gas contract that results in a gas price that is below the current market price for gas and the short term market heat rate indicates that the plant should not operate (i.e. the MHR is below 7.3Gj/MWh), then the plant operator is better off financially selling the gas back to the market and not operating, rather than converting the gas to electricity, (which has a lower market value) and then "storing" this electric energy behind a dam for some possible future date when electricity prices are higher. Even though such an action is theoretically possible, it nevertheless represents a subsidy to the CCGT during those hours of operation. That subsidy must be valued and applied to all other alternatives for the resolution of Vancouver Island's potential capacity shortfall problem.

BCUC OPTIONS AND OUR RECOMMENDATION

While not offering a legal opinion, the JIESC's layman's assessment that the principal options facing the BCUC in ruling on VIEC/BC Hydro's Application for a CPCN are the following:

- Award the CPCN unconditionally
- Award the CPCN with conditions
- Delay issuance of the CPCN until certain conditions are met by the applicant
- Deny the CPCN

The recommendation of the JIESC is that the BCUC deny the requested CPCN. Preferably, this should be done in a fashion that will force BC Hydro to immediately and aggressively explore all other options and select the project (or portfolio of projects) and/or management approaches that will provide a Vancouver Island and the BC Hydro system as a whole, a considered and well-reasoned solution at much less cost than VIGP. Unless the BCUC is prepared to take that approach, we are doubtful that other approach will motivate BC Hydro to prepare a complete and rational assessment of the options available and select the best option for all of BC and the ratepayers. We are particularly concerned that any CFT process may not include transmission,

load management, and peaking facility options, but only capacity/generation projects as an alternative to VIGP.

Should the BCUC decide that a delay in issuance of a CPCN is appropriate, it would then have the task of laying out the necessary conditions for eventual issuance of the CPCN. Evaluating the alternatives in a comprehensive and complete way is a large and complex task. Further, there may be alternatives that are not yet apparent. We would urge the BCUC to impose conditions that effectively require a complete, rational, and objective assessment of all alternatives including transmission, on-island generation by third parties, and load management by industrial customers. We suggest the task must be completed "to the satisfaction of the BCUC", not BC Hydro.

Because of the difficulty writing specific conditions for a CPCN that are clear and unambiguous, we suggest never ending arguments are likely over whether VIEC/BC Hydro met the specified conditions. Therefore we believe a conditional CPCN to be essentially unworkable.

Finally, we submit that the issuance of an unconditional CPCN would fail to recognize the overwhelming evidence that proceeding directly to begin construction of VIGP and GSX would be adverse to the interests of all of BC Hydro's customers.

All of which is respectfully submitted this 22nd day of July, 2003.