

# ***HQT OATT Phase 2 Evidence***

## **Imbalance Pricing and Related Issues (Schedules 4 and 5)**

Régie de l'énergie

DOSSIER: R-3669-2008 Phase 2

DÉPOSÉE EN AUDIENCE

Date: 18/04/2011

Pièces n°: C-6-96 EBT

***WK(Bill) Marshall, P.Eng.***

***WKM Energy Consultants Inc***

***Bill.Marshall@rogers.com***

***WKM  
Energy***

## **Objective of the FERC Orders**

The general purpose of FERC Order 890 and the follow up re-hearing orders as stated in the SUMMARY is *“amending the regulations and the pro forma open access transmission tariff adopted in Order Nos. 888 and 889 to ensure that transmission services are provided on a basis that is just, reasonable and not unduly discriminatory or preferential.”*

More specifically the changes in each of the Orders *“are designed to:*

- (1) strengthen the pro forma OATT to ensure that it achieves its original purpose of remedying undue discrimination;*
- (2) provide greater specificity to reduce opportunities for undue discrimination and facilitate the Commission’s enforcement;*
- (3) increase transparency in the rule applicable to planning and use of the transmission system.”*

## ***FERC Requirements in Order 890***

FERC's objective regarding imbalance pricing is to eliminate the variability and confusion in the industry but also ensure that the level of charges provides the proper incentive to **keep schedules accurate without being excessive**

The Commission adhered to the following three principles:

- “(1) the **charges must be based on incremental cost** or some multiple thereof;*
- (2) the charges must **provide an incentive for accurate scheduling**, such as by increasing the percentage of the adder above (and below) incremental cost as the deviations become larger; and*
- (3) the provisions must **account for the special circumstances presented by intermittent generators** and their limited ability to precisely forecast or control generation levels, such **as waiving the more punitive adders** associated with higher deviations.” (890 P663)*

## ***FERC Requirements in Order 890***

Tiered approach to imbalance pricing based on the above three principles for

Energy Imbalance (Schedule 4 in proforma - 5 in HQT tariff)

Generator Imbalance (Schedule 9 in proforma – 4 in HQT tariff)

Three bands defined as

1. Up to 1.5 percent of the scheduled energy (or two megawatts)
2. Between 1.5 and 7.5 percent (or two to ten megawatts)
3. Greater than 7.5 percent (or 10 megawatts)

Pricing for each band as

1. Incremental /decremental cost for monthly net
2. +/-10% of incremental /decremental cost hourly
3. +/-25% of incremental /decremental cost hourly

# ***FERC Requirements in Order 890***

## **Definition of Incremental and Decremental cost**

*“Incremental cost and decremental cost represent the Transmission Provider’s actual average hourly cost of **the last 10 MW dispatched for any purpose**, e.g., to supply the Transmission Provider’s Native Load Customers, correct imbalances, or make off-system sales” (proforma schedules)*

## **Costs can include commitment and O&M costs**

*“Costs should **only be the additional costs** incurred by the transmission provider due to the imbalance” (890 P689)*

## **Use of opportunity costs**

*“Consider proposals to include recovery of **legitimate and verifiable opportunity costs** on a case-by-case basis ... [but] ... **not lead to over-recovery of costs**” (890-A P311)*

## **Use of market proxy costs**

*“.. must represent **a valid alternative to the incremental cost calculation**” (890 P692)*

# **FERC Requirements in Order 890**

## **Penalties of +/-10% and +/-25% apply to Band 2 and Band 3**

*“Such an approach [based on a tiered structure] recognizes the link between **escalating deviations** and **potential reliability impacts** on the system while keeping imbalance charges **closely related to incremental costs.**” (890 P72)*

*“The Commission adopts in the pro forma OATT imbalance provisions **similar to those implemented by Bonneville.** We agree with commenters that a **graduated bandwidth approach recognizes the link between escalating deviations and potential reliability impacts** on the system.” (890 P663)*

*“We also **decline to** institute a larger bandwidth or **eliminate the penalty structure...**” (890A P271)*

# ***FERC Requirements in Order 890***

## **Penalties for intentional deviations are not required**

In the NOPR, the Commission noted that Bonneville imbalance provision includes additional charges for “*intentional deviations*”.

*“The Commission recognizes the need to provide transmission customers with the appropriate incentives not to intentionally dump power on the system or lean on other generation. **We do not believe, however, that separate penalties for intentional deviations need to be generically imposed in the pro forma OATT.** The tiered imbalance penalties adopted in this Final Rule generally provide a sufficient incentive not to engage in such behavior. **Proposals to assess additional penalties for intentional deviations will continue to be considered on a case-by-case basis, subject to a showing that they are necessary** under the circumstances. We note that any such tariff provisions must include clearly defined processes for identifying intentional deviations and the associated penalties.” (890, P676)*

# ***FERC Requirements in Order 890A***

**Penalties for intentional deviations are not required**

***“The Commission denies rehearing of the decision in Order No. 890 not to impose generic penalties for intentional deviations. We continue to believe that it is appropriate to maintain the status quo of aggregating net generation over the hour in the pro forma OATT. To the extent a transmission provider wishes to adopt additional penalties for intentional deviations, it may do so provided it can show they are necessary under the circumstances.” (890A P298)***

## ***Proxy Pricing Formula for Quebec***

**Régie Decision D-2009-015 ordered HQT to develop a reference price for energy imbalance that is based on the hourly market prices in adjacent areas.**

*“La Régie considère que l’utilisation d’un prix de marché satisfait l’objectif d’offrir une juste compensation au fournisseur du service, sans créer d’opportunités d’arbitrage pour les clients du Transporteur.*

*La Régie est d’avis que le prix de référence doit refléter les prix horaires sur les marchés limitrophes, ajustée des coûts de transport.” (p. 111)*

**The decision indicates that**

- **« un prix de marché »** is sufficient
- HQT would be **fairly compensated**
- There is no need for **a double penalty** of +/-10 or 25 plus a fixed price

**The decision is consistent with FERC objectives and principles**

# ***WKM Imbalance Proposal***

**Utilizes tiered approach consistent with the FERC 890 principles**

1. based on incremental cost
2. provides an incentive for accurate scheduling
3. special circumstances presented by intermittent generators

**Applies the three bands defined by FERC**

1. Up to 1.5 percent of the scheduled energy (or two megawatts)
2. Between 1.5 and 7.5 percent (or two to ten megawatts)
3. Greater than 7.5 percent (or 10 megawatts)

**Applies the penalty structure approved by FERC**

Band 2 is +/-10%

Band 3 is +/-25% (intermittent generators are exempt)

**Determines incremental cost consistent with both FERC approach and the Régie decision**

Adjacent market price for **the last 10 MW dispatched by Hydro Quebec** adjusted for transmission

## ***HQT Imbalance Proposal***

### **Agreeable points with WKM**

Applies three bands consistent with FERC Order 890

Applies market prices for Band 1 adjusted for transmission consistent with the Régie decision

Applies penalty adders of +/-10% and +/-25% for bands 2 and 3

Provides relief for intermittent generators from band 3

### **Unacceptable points**

There are different incremental and decremental prices

Incremental price is highest of NE, NY and Ont

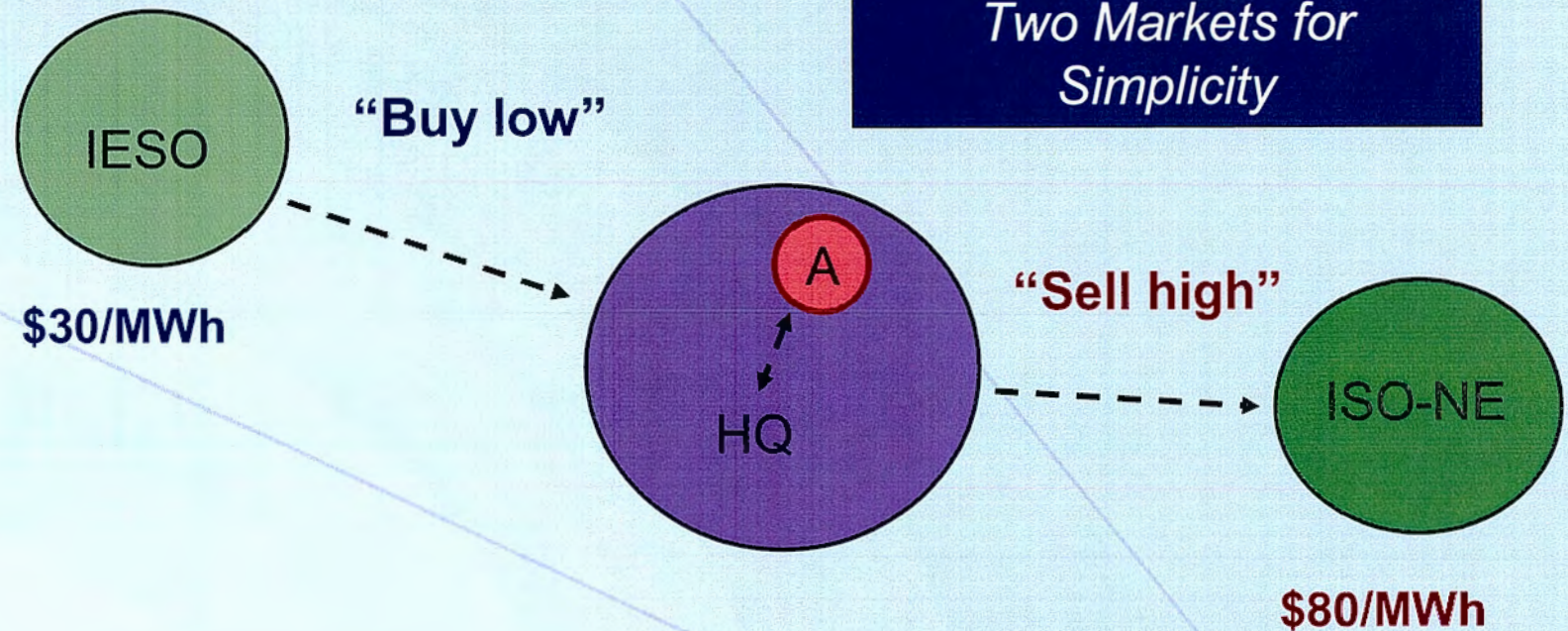
Decremental price is lowest of NE, NY and Ont

Additional fixed penalty prices are added to the market prices

Minimum incremental price of \$100/MWh in Bands 2&3

Maximum decremental prices of \$25/MWh in Band 2 and \$0/MWh in Band 3

## Dr Orans Presentation in Support of HQT



Simplicity ignores the reality of HQ activity in the markets  
Do they always buy low?  
Do they always sell high?  
We need more detailed understanding

## ***WKM Imbalance Pricing***

Objective is to comply with the Régie decision to use market prices from an adjacent area.

- **But what price?**

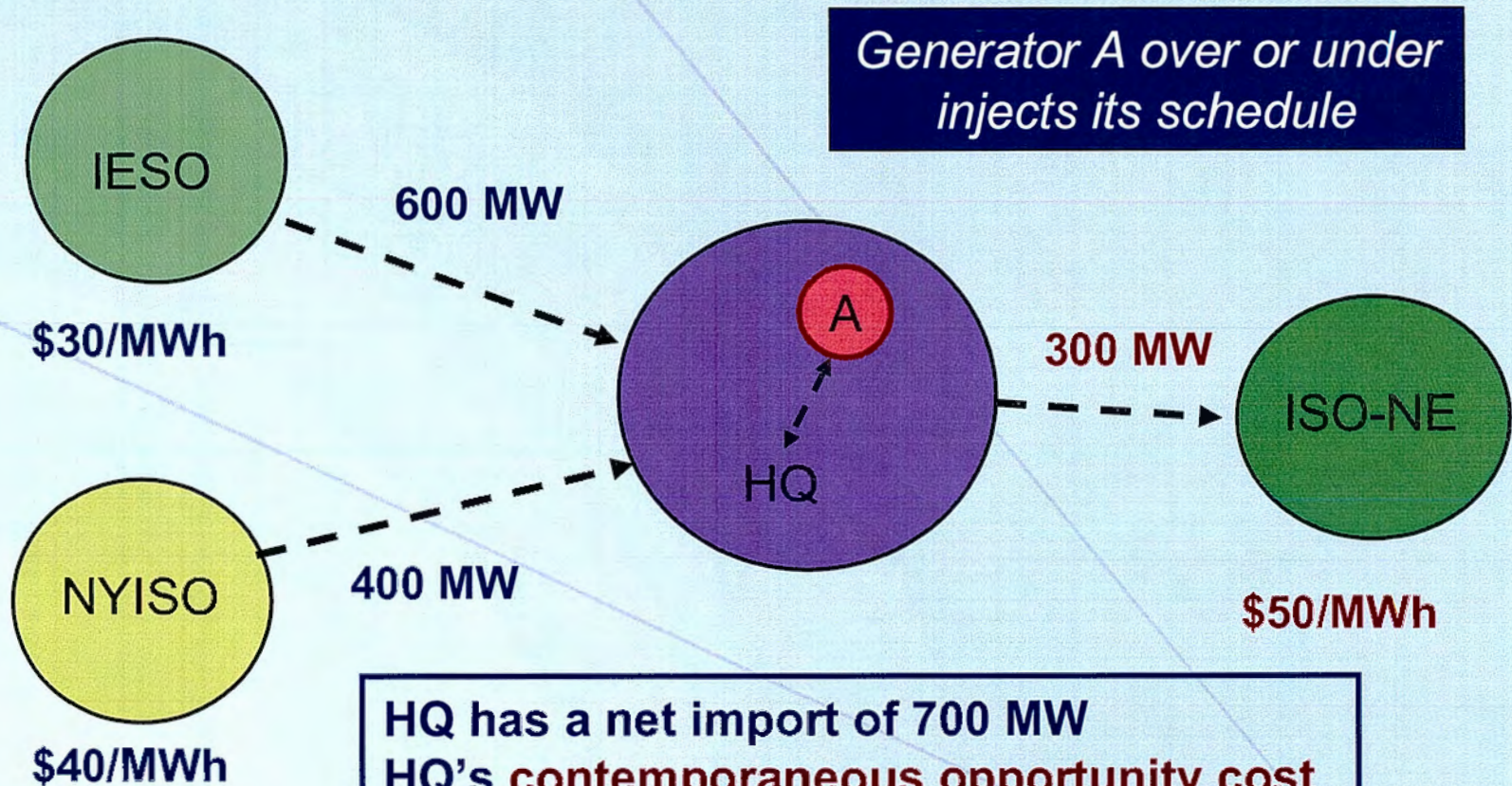
Approach is to determine for the “***last 10 MW dispatched for any purpose***” by Hydro Québec either

- the delivered cost of imports or
- the “***opportunity value to Hydro Québec***” of exports

Two situations are considered to determine a price for imbalance

- When Hydro Québec (HQD & HQP) is a **net importer** then HQ is a buyer but at what price
- When Hydro Québec (HQD & HQP) is a **net exporter** then HQ is a seller but at what price

## **WKM Imbalance Proposal** **HQ is a Net Importer**

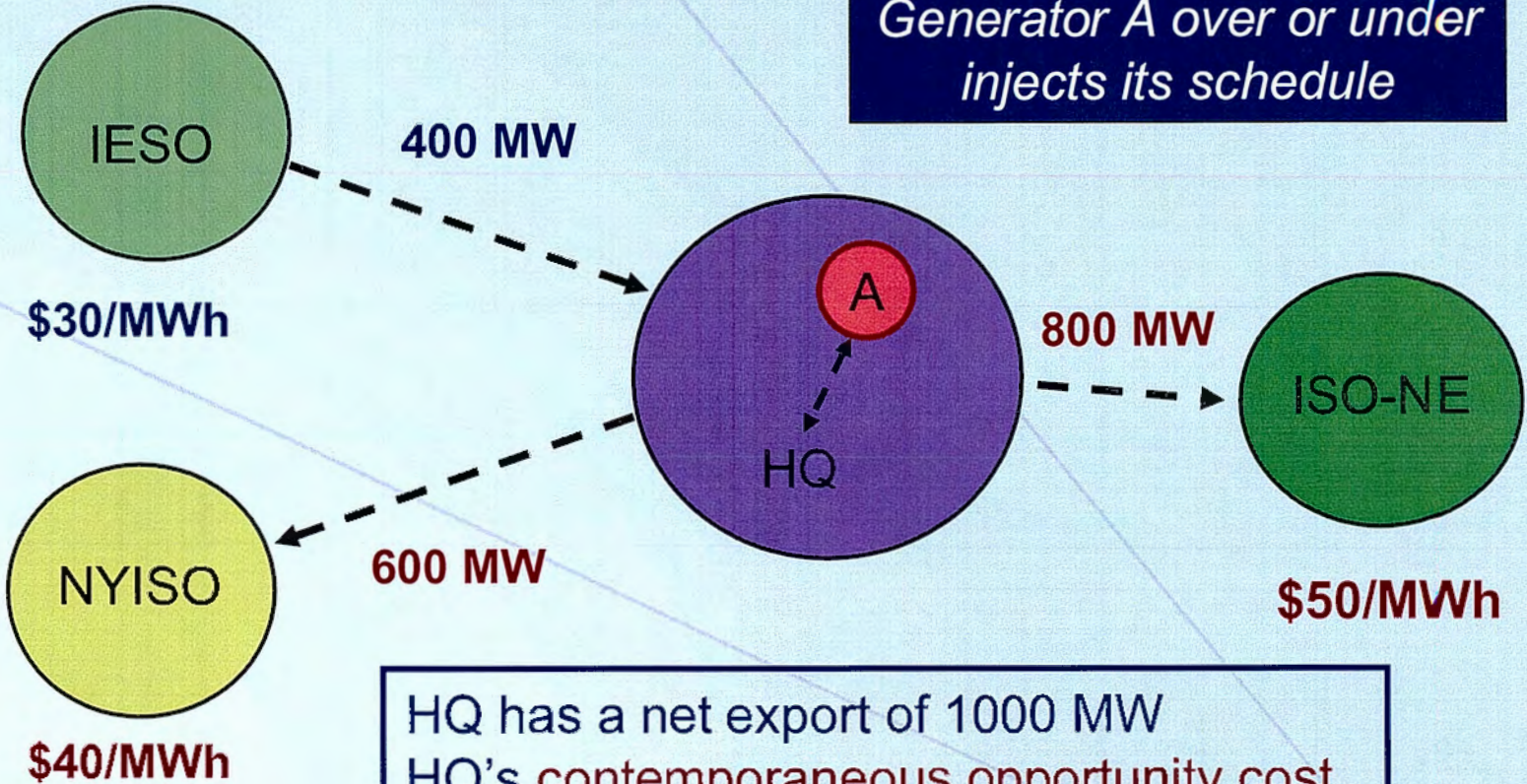


**WKM**  
**Energy**

# WKM Imbalance Proposal

## HQ is a Net Exporter

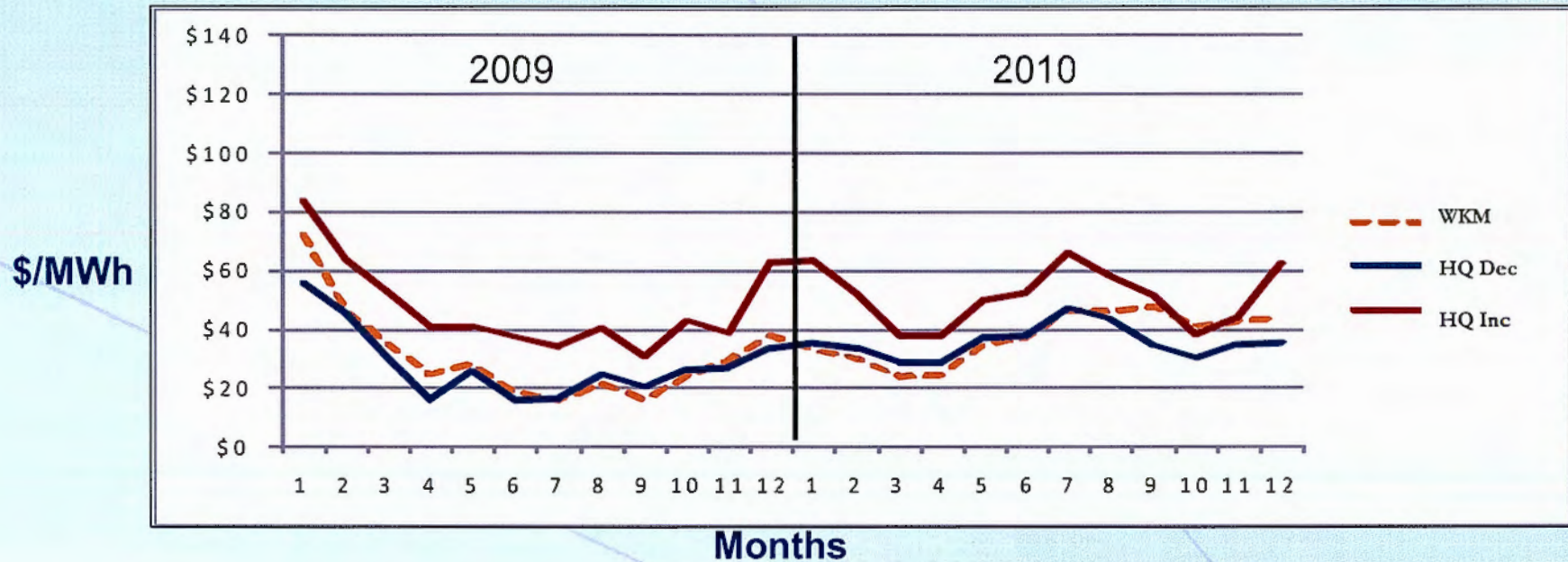
Generator A over or under injects its schedule



HQ has a net export of 1000 MW  
HQ's contemporaneous opportunity cost is the value of the last 10 MW dispatched to sell to NYISO at **\$40/MWh less** transmission adjustments

**WKM**  
*Energy*

# ***WKM Imbalance Proposal***



*Proposal reflects HQ market behaviour*

- HQ often sells to lowest price market
- HQ sometimes buys from highest price market
- HQ is not able to use storage to always “buy low and sell high”
- HQ real behaviour is counter to Dr Orans’ assumptions in response to IR 7.1 at page 10 of his presentation (HQT-43 Doc 2)

***WKM  
Energy***

## ***Critique of WKM Imbalance Proposal by Dr. Orans and HQT***

**Critique and rebuttal has been focused on the following areas:**

- WKM proposal provides significant “*arbitrage opportunities*” that need to be blocked
- All imbalanced schedules and especially arbitrage cause harm to HQT’s “*grid reliability*”
- The WKM proposal violates “*cost causation*” and “*user pay*” principles and would create a “*revenue shortfall*” that HQT would need to deal with
- Bonneville is similar to HQ and has similar imbalance pricing

**Each is addressed in the following slides**

## ***Critique of WKM Imbalance Proposal (Arbitrage Opportunities)***

IR 7.1 response by Dr Orans to Régie (HQT-29 Doc 1)

- 1MW intraday arbitrage value (12 lowest to 12 highest hours) is estimated by Dr. Orans at \$158,000
- The \$158,000 compares to penalty recovery in the HQP formula for 1MW imbalance in Band 2 of up to \$380,000 and in Band 3 of up to \$550,000

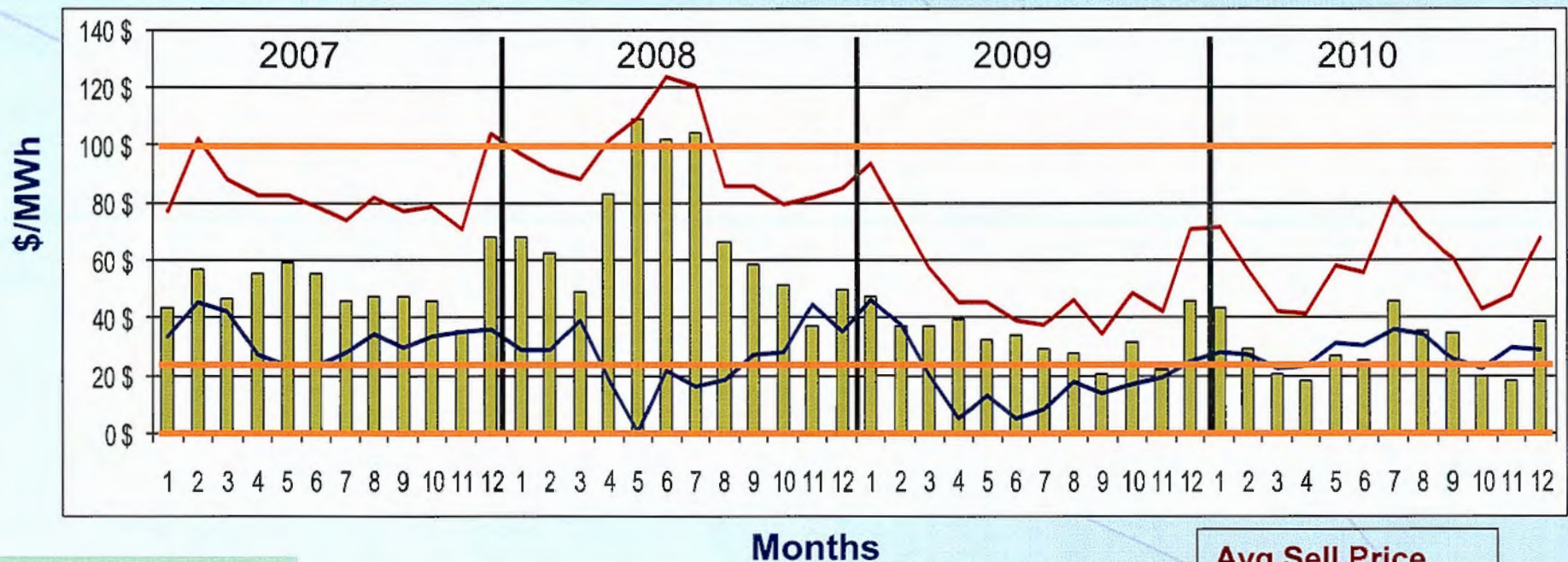
Dr Orans presentation (HQT-43 Doc 2)

- Fixed prices are not penalties but value of HQ storage but no data was provided
- 2008 was acknowledged as an unusual year but 2009 and 2010 were not considered

# Critique of WKM Imbalance Proposal (Arbitrage Opportunities)

Extending Dr Orans' analysis\* for intraday trading to 2007 and 2010:

- Confirms that 2008 was an unusual year
- Shows that the "value" of HQP storage (even with perfect knowledge of the day ahead market and 100% available access) is much less than \$100/MWh



\* HQT-43 Doc 2 slide 12  
WKM data assumptions in Attachment A

**Avg Sell Price**  
**Avg Buy Price**  
**Avg Difference**  
**HQP Fixed Prices**

**WKM**  
**Energy**

## ***Critique of WKM Imbalance Proposal (Arbitrage Opportunities)***

*“Marshall’s proposal encourages deviations during 50% of hours”*

- This is based on the assumption that “HQ is a net exporter during high market price hours and a net importer during low hours”
- Our previous analysis has shown this to be false
- This would require perfect future knowledge of prices by hour in all three neighbouring markets
- This is a hypothetical analysis not based on reality

## ***Critique of WKM Imbalance Proposal (Harm Grid Reliability)***

### **Imbalances and arbitrage could harm HQT's "grid reliability"**

- No evidence on reliability impact was provided only that any deviation contributes to reducing reliability
- WKM submits that the relative impacts are very small
  - Total long term firm Pt-to-Pt by others totals about 600 MW
  - 10% Deviation (all schedules in same direction) is 60 MW
  - 30% variation in 700 MW of existing wind is 210 MW
  - 30% variation in 4,500MW of planned wind is 1,350 MW
  - HQT 10 minute operating reserve is 1000 MW
  - Load in Québec Interconnection varies from about 15,000 to 35,000 MW
- If there is a rare issue HQT has rights "in its sole discretion" to "take whatever actions .. are reasonably necessary" to maintain reliability (13.6, 14.7 of the Tariff)
- FERC maintains that +/-10% & +/-25% charges are sufficient to address reliability

## ***Critique of WKM Imbalance Proposal (Cost Causation/User Pay/Revenue Shortfall)***

It violates “*cost causation*” and “*user pay*” principles and would create a “*revenue shortfall*”

- This assumes that
  - HQT must accept the HQP offer
  - HQP maximum and minimum prices are true “opportunity costs”
  - HQT and HQP can legitimately contract for imbalance service
- It ignores the issue that HQ Corporation is the Transmission Provider and not HQT
- The role of HQ Corporation needs to be examined

# Issue of HQ Corporation as the Transmission Provider

## Québec Law

The Act respecting the Régie de l'énergie (S. 2) defines "electric power carrier" as "Hydro-Québec when carrying on electric power transmission activities"

The HQ tariff (S. 1.62) defines "Transmission Provider" as "Hydro-Québec when carrying on electric power transmission activities"

The Hydro Québec Act (S. 29) confirms HQ as an integrated utility as it "may generate, acquire, sell, transmit and distribute power."

## FERC View

Response to IR 9.1 of C-6-33 traces FERC's view that the "Transmission Provider" is the integrated utility corporation

*"Because a transmission provider may use its system in different ways (e.g., to integrate load and resources when serving retail native load, to make off-system sales or purchases, or to serve wholesale requirements customers), the Commission set for hearing the factual issues associated with identifying those uses, as well as any potential impediments or consequences to providing comparable services to third parties". (Order 888, P. 37)*

## ***Critique of WKM Imbalance Proposal (Cost Causation/User Pay/Revenue Shortfall)***

HQ Corporation is the “*Transmission Provider*”

The Régie has the exclusive jurisdiction to fix the rates (s. 31(1))

These issues raised by Dr Orans and HQT are eliminated with a Régie approved formula based on different “*opportunity costs*”

- “***User pay***” is met as per Orans in HQT-29-Doc2 Q1a (ACEF)
- “***Cost causation***” is satisfied with proper “***opportunity costs***”
- The “***revenue shortfall***” is an internal HQ Corporation issue and is not part of any tariff revenue requirement that HQT or the Régie must deal with

## ***Rebuttal of WKM Imbalance Proposal (Bonneville similar to HQ)***

Dr Orans in HQT-43-1, Doc. 2, page 13 and Undertaking # 9 (B-169)

BPA is similar to HQ

- Predominate hydro utility with storage
- Applies separate buy and sell price and storage value
  - Band 3 only using highest/lowest incremental price each day
  - Penalties for intentional deviations of \$100 or 125% of highest
- Pricing for Bands 1 and 2 based on Mid C market prices with separate consideration for on peak (HLH) and off peak (LLH)

Correction is required for Band 3

The highest and lowest incremental costs are **not as Dr Orans reported** for the day but are for the HLH and LLH sub periods in each day.

## ***HQT Imbalance Proposal Overview***

The proposal is **inconsistent with FERC** Order 890

The proposal **discriminates and is unduly punitive** as evident in the imbalance prices for Hour 8 Jan 16/09

Charges for band 3 short schedule = \$494.01/MWh

Payment for band 3 long schedule = \$0.00/MWh

Fixed prices are **not the value of storage** in the HQT system but are **double penalties**

HQT pricing is **not in the public interest of Québec** as it discourages transmission use by third parties and limits open access

## ***WKM Imbalance Proposal Overview***

The proposal is based on market prices adjusted for transmission as required by the Régie in its Phase 1 Decision D-2009-015

### **The proposed market prices**

- Reflect the value of the “last 10 MW dispatched” by HQ
- Reflect the market behaviour of HQ including its use of storage to buy and sell
- Are the “true opportunity cost” value of energy to HQ

The resulting imbalance prices are consistent with FERC and fulfill HQ Corporation’s obligation to provide reciprocal transmission access such that HQUS can maintain its Power Marketing Authorization

Appendix B in the WKM evidence (**updated in IR 2.5 in C-6-36**) details wording for Schedules 4 and 5 for easy implementation

# ***Attachment A***

## ***Data Assumptions re Slide 16 Analysis***

### **Market Prices**

- Real time hourly prices for each market (NYISO Zone M, ISO-NE Phase 2 and IESO HOEP) acquired through data provider ZE Power

### **Exchange rates**

- Daily close rates from the Bank of Canada

### **Transmission adjustments**

- Same fees as provided in HQT proposal for buying or selling from/to each market

### **Interchange flows**

- Total flows on ON-HQT, LAW-HQT, MASS-HQT and NE-HQT acquired through data provider ZE Power
- Vermont and NB interconnections were ignored
- Results would be an approximation of actual Net import or net export
- Real net import/export position of HQ requires access to HQT OASIS and detailed hourly analysis of all schedules