

June 12th, 2018

MAG Energy's Feedback to Intertie Congestion Pricing proposal

IESO has stated multiple times that intertie transactions are important for reliability reasons and preventing global market power. Furthermore, import transactions provide possibility for lower-cost supply options, and at times of lower demand, when internal generation is not required to meet provincial needs, exports are an efficient way for the Ontario system to earn revenues to help cover fixed costs that otherwise would have to be paid for by Ontario consumers. The IESO's 2014 report "*Review of Ontario Interties*" made it clear that intertie transactions are a benefit to the province for many reasons, including reducing costs to Ontario consumers.

IESO's Market Renewal should seek to increase the benefit of intertie transactions. However, MAG believes that the current intertie congestion pricing proposal will have the opposite effect and the proposal will discourage the full and efficient scheduling of the interties and will harm IESO's market as a whole.

The proposed Method 2 limits the settlement price of imports and increases the settlement cost of exports when the intertie is scheduled to full capacity. The proposed method will discourage importers and exporters from fully scheduling the interties even when the predispach price signals would indicate that the interties should be fully scheduled.

The Method 2 pricing proposal will incentivize importers to offer less MWs into the Ontario market and to increase their offer prices, which is opposite to IESO's desired outcome. Example 2 below demonstrates that an importer who is bidding according to the price signals may be penalized with a substantial drop in revenue as soon as 1 MW more is imported to fully schedule the intertie. Under the current proposal, the importer could reduce the financial penalty it suffers by reducing the amount offered to reduce the risk of the intertie being fully scheduled.

Method 2 will have a similarly negative effect on the export market as it will also incentivize exporters to reduce the amount of power exported from Ontario and to reduce their bid prices. Example 3 below demonstrates that Method 2 exposes exporters to a very high risk of financial loss, with no opportunity to earn a proportionate level of reward. There will be much less incentive for exporters to participate in the Ontario market if the risk of loss is much higher than the opportunity for a reasonable profit.

Another problem with the current proposal is that it severely discriminates between importers and generators. Importers bring as much value to the Ontario power system as do generators as they both represent important supply options, and importers should not be placed in a worse economic position than generators. The RT Import Offer Guarantee does not eliminate the discrimination. Examples 1 and 4 below demonstrates that even with the RT IOG the current intertie proposal (Method 2) will result in situations where importers will earn much less revenue than generators, even though both the importer and the generator are offering at the same or similar price.

Example 1 – When internal transmission constraint is no longer binding

Assuming the import line capacity is 100 MW, there are no intra zone transmission constraints and the load is solely non-dispatchable so it doesn't affect the pricing. At the moment of final intertie schedules, i.e. at the hour-ahead predispach, the import line is full at 100 MW and there is congestion between Zone 1 and Zone 2 due to a transmission line being partially constrained to 170 MW.

However in real-time, the line is back to its full capacity of 300 MW, resulting in a disparity between the settlement price of the import supplier and the generators near the intertie. This discrepancy will create an amount required to be allocated. In IESO's current system, the over collected amount is allocated in the Transmission Rights Clearing Account. However, in the new single schedule market, IESO plans to settle the TRs based on the day-ahead market. Since the loads will pay exactly the same price as the generators will receive to produce, we are interested to know which market participants will inherit this over collected amount. Note that this amount exists even if method 1 (status quo) is being implemented but method 2 can only result in a larger collection.

The examples provided by IESO in the December presentation did not show what would happen in case internal transmission constraints changed between hour-ahead predispach and real-time. Our example emphasizes the fact that imports will not be settled as internal resources in those situations.

FULL INTERTIE

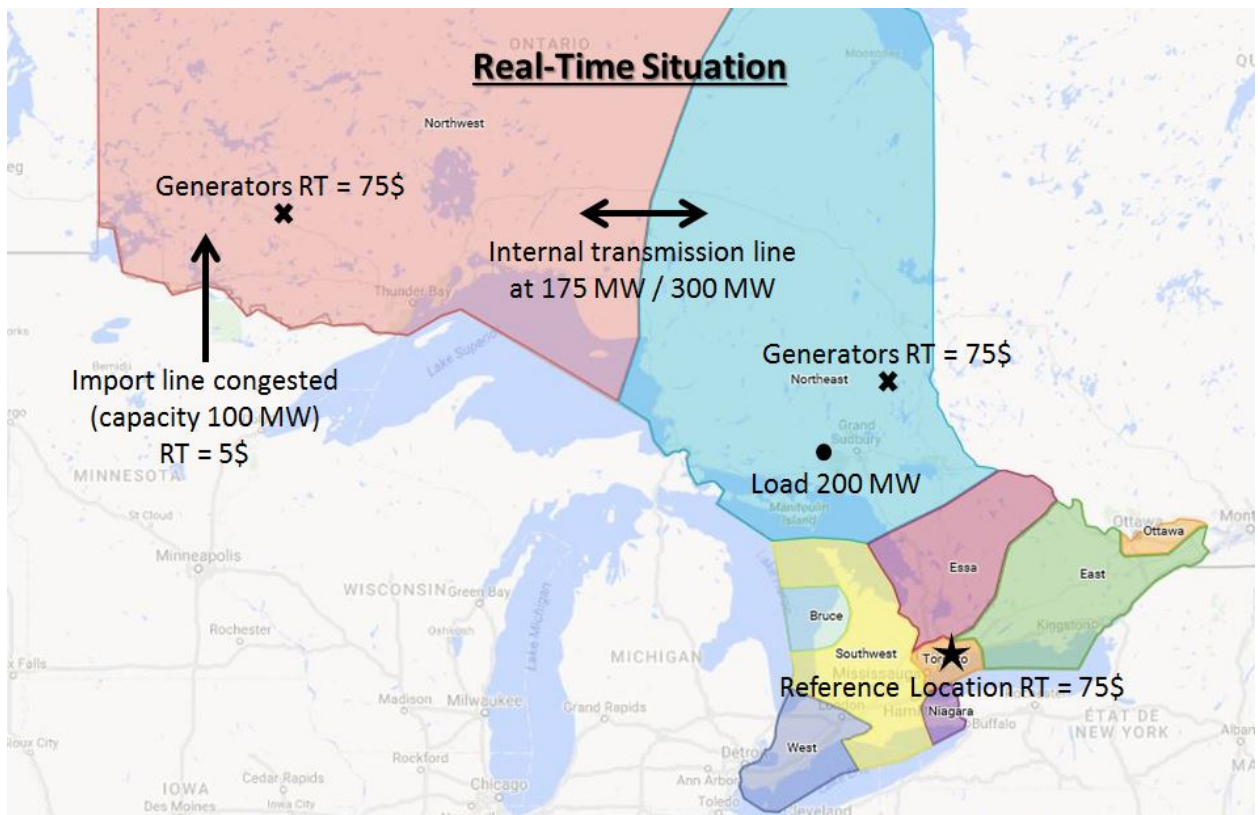
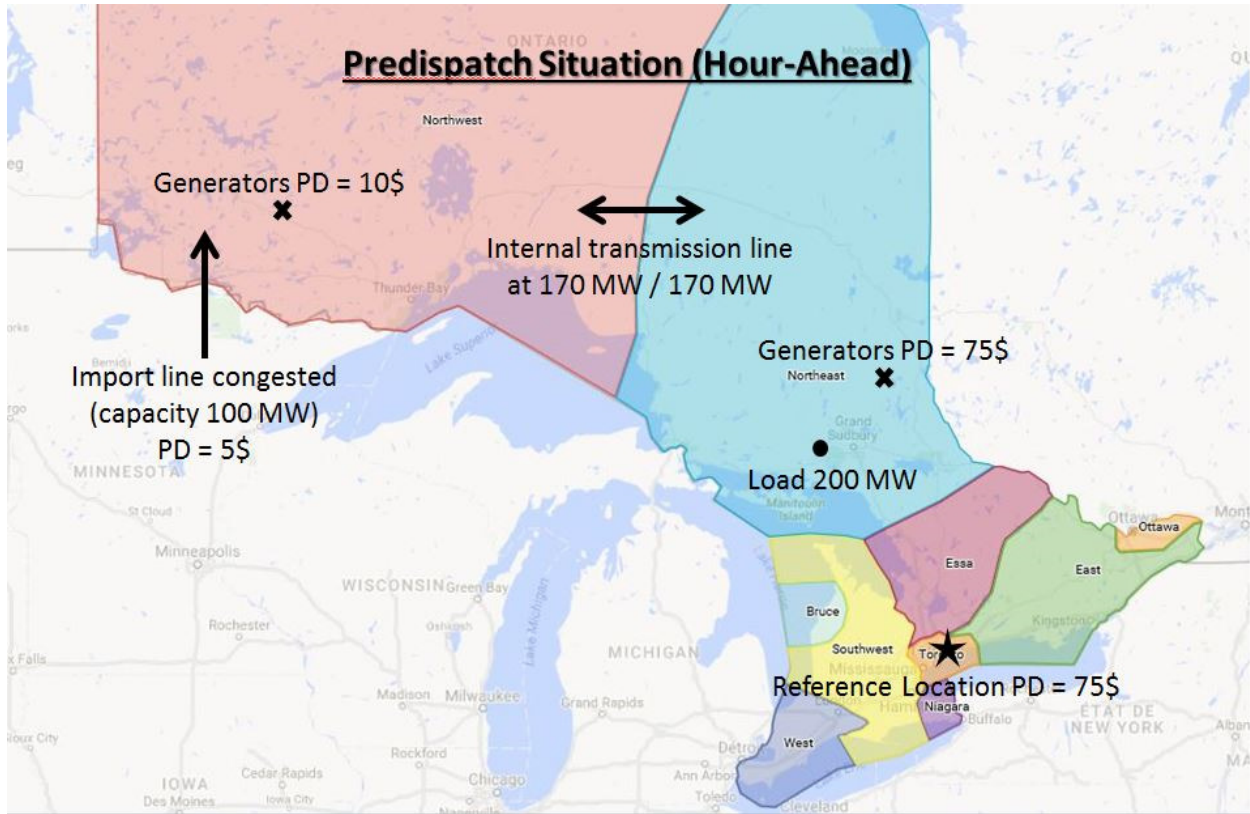
PREDISPACH SITUATION (HOUR-AHEAD)

ZONE 1					ZONE 2 (LOAD 200 MW)				
	OFFER MW	OFFER PRICE	SCHEDULED MW	PD PRICE		OFFER MW	OFFER PRICE	SCHEDULED MW	PD PRICE
IMP A	100	\$5	100	\$5	GEN E	20	\$50	20	\$75
GEN B	25	\$6	25	\$10	GEN F	20	\$75	10	\$75
GEN C	25	\$8	25	\$10	GEN G	20	\$100	0	\$75
GEN D	25	\$10	20	\$10	GEN H	20	\$105	0	\$75
TOTAL MW				170	TOTAL MW				30

REAL-TIME SITUATION

ZONE 1					ZONE 2 (LOAD 200 MW)				
	OFFER MW	OFFER PRICE	SCHEDULED MW	RT PRICE		OFFER MW	OFFER PRICE	SCHEDULED MW	RT PRICE
IMP A	100	-\$2,000	100	\$5	GEN E	20	\$50	20	\$75
GEN B	25	\$6	25	\$75	GEN F	20	\$75	5	\$75
GEN C	25	\$8	25	\$75	GEN G	20	\$100	0	\$75
GEN D	25	\$10	25	\$75	GEN H	20	\$105	0	\$75
TOTAL MW				175	TOTAL MW				25

	<u>METHOD 1</u>		<u>METHOD 2</u>	
	AMOUNT	PRICE/MWh	AMOUNT	PRICE/MWh
LOADS COST (200 MWh)	\$15,000	\$75	\$15,000	\$75
IMPORTERS REVENUES (100 MWh)	\$7,000	\$70	\$500	\$5
GENERATORS REVENUES (100 MWh)	\$7,500	\$75	\$7,500	\$75
NET TO ALLOCATE	\$500		\$7,000	



Example 2 – When a single megawatt is worth thousands of dollars

The discrimination shown in the previous example will create an incentive to not fully schedule the line when needed, contradicting IESO’s objective to encourage efficient bids and offers.

If the imports were to be reduced by 1 MW and be replaced by internal generation, the value of the next available MW, most likely a higher-cost supply option, would represent the real cost of power and the imports should be settled according to it.

Under method 2, the importers settlement discrepancy for only 1 MW less of import is so extreme that MAG believes the volume at the interties will decrease significantly in order to reduce the risk of being penalized. In the following example, assuming the same hour-ahead predispach situation as example 1 except the congested import line, the settlement discrepancy is 7000\$; does it make sense? The difference between those situations for only 1 MW seems to be unfair and unreasonable.

INTERTIE NOT FULL

PREDISPATCH SITUATION

ZONE 1					ZONE 2 (LOAD 200 MW)					
	OFFER MW	OFFER PRICE	SCHEDULED MW	PD PRICE		OFFER MW	OFFER PRICE	SCHEDULED MW	PD PRICE	
IMP A	99	\$5	99	\$10	GEN E	20	\$50	20	\$75	
GEN B	25	\$6	25	\$10	GEN F	20	\$75	10	\$75	
GEN C	25	\$8	25	\$10	GEN G	20	\$100	0	\$75	
GEN D	25	\$10	21	\$10	GEN H	20	\$105	0	\$75	
TOTAL MW			170		TOTAL MW			30		

REAL-TIME SITUATION

ZONE 1					ZONE 2 (LOAD 200 MW)					
	OFFER MW	OFFER PRICE	SCHEDULED MW	RT PRICE		OFFER MW	OFFER PRICE	SCHEDULED MW	RT PRICE	
IMP A	99	-\$2,000	99	\$75	GEN E	20	\$50	20	\$75	
GEN B	25	\$6	25	\$75	GEN F	20	\$75	6	\$75	
GEN C	25	\$8	25	\$75	GEN G	20	\$100	0	\$75	
GEN D	25	\$10	25	\$75	GEN H	20	\$105	0	\$75	
TOTAL MW			174		TOTAL MW			26		

	FULL INTERTIE (FROM EXAMPLE 1)		INTERTIE NOT FULL	
	AMOUNT	PRICE/MWh	AMOUNT	PRICE/MWh
LOADS COST (200 MWh)	\$15,000	\$75	\$15,000	\$75
IMPORTERS REVENUES	\$500	\$5	\$7,425	\$75
GENERATORS REVENUES	\$7,500	\$75	\$7,575	\$75
NET TO ALLOCATE	\$7,000		\$0	

Example 3 – Export transaction analysis

Suppose a market participant forecasts NY RT price at 60\$ and IESO RT price at 40\$. IESO’s preferred outcome would be for the exporter to bid at the IESO intertie at 60\$, which is the price expected to be received in NYISO. If the export line is fully scheduled with a congestion price of 20\$, under method 2, the settlement outcome for the exporter highly depends on IESO’s capacity to accurately forecast real-time. Assuming there is no bias between forecasted and real-time prices in IESO as discussed in June 7th meeting, this result in all nine scenarios shown below having the same probability to happen.

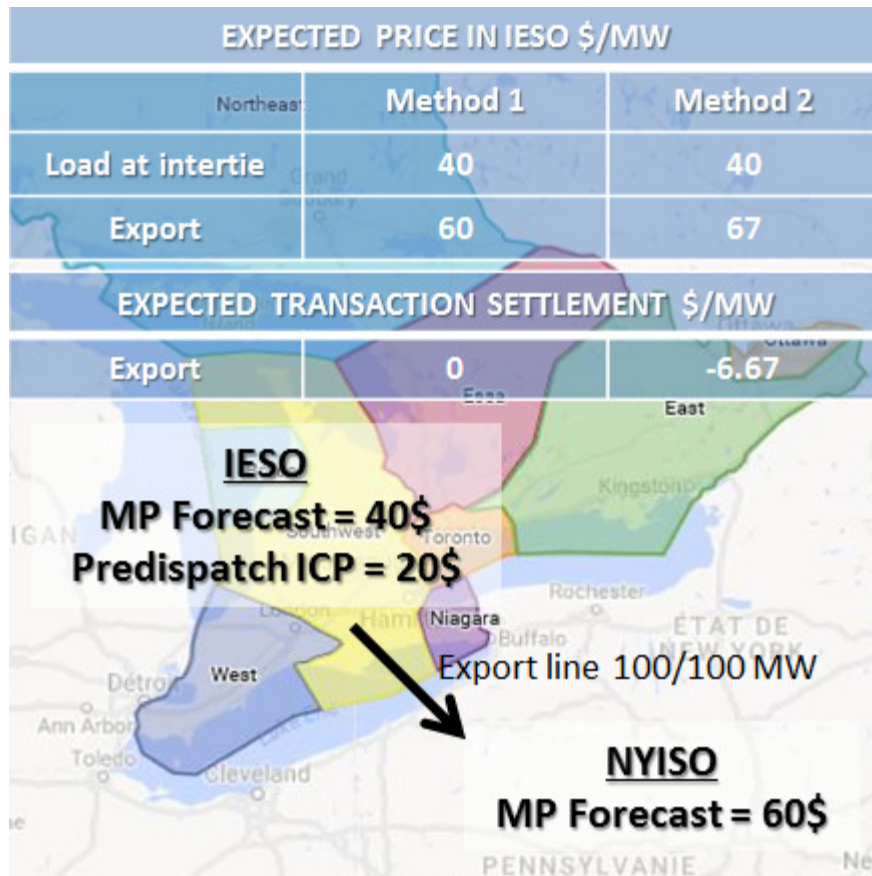
Export transaction settlement \$/MW

Method 1 (expected transaction settlement = 0\$/MW)

		NY RT Price			
		NY RT = 40	NY RT = 60	NY RT = 80	
IESO RT Price	Intertie RT < PD	Intertie RT price = 0 Export Settlement price = 20	20	40	60
	Intertie RT = PD	Intertie RT price = 40 Export Settlement price = 60	-20	0	20
	Intertie RT > PD	Intertie RT price = 80 Export Settlement price = 100	-60	-40	-20

Method 2 (expected transaction settlement = -6.67\$/MW)

		NY RT Price			
		NY RT = 40	NY RT = 60	NY RT = 80	
IESO RT Price	Intertie RT < PD	Intertie RT price = 0 Export Settlement price = 60	-20	0	20
	Intertie RT = PD	Intertie RT price = 40 Export Settlement price = 60	-20	0	20
	Intertie RT > PD	Intertie RT price = 80 Export Settlement price = 80	-40	-20	0



This example shows that there will be incentive for the exporter to not bid according to its expected cost in the neighboring market. Under method 2, the market participant will lose money doing this transaction on average, even if he took risk to provide efficiency to the markets. Overtime, this will result in less transaction scheduled on the transmission lines. Under method 1, the market participant would make nothing but lose nothing on average. This is the best outcome to be targeted in intertie scheduling. Under this settlement method, a fully scheduled line that is priced in IESO as the expected revenue in NYISO will not penalize the market participant and it will preserve the incentive to schedule transactions.

With main export interties being full at least 50% of the hours in 2017, the high risk of limited gains for exporters will most likely result in a decrease in such transactions. This should be a concern for Ontario-based generators but also for other market participants as exporters pay fees that would otherwise be paid by Ontario consumers. As per IESO's 2014 report "Review of Ontario Interties", exports have reduced costs for Ontarians by approximately \$300 million in 2013.

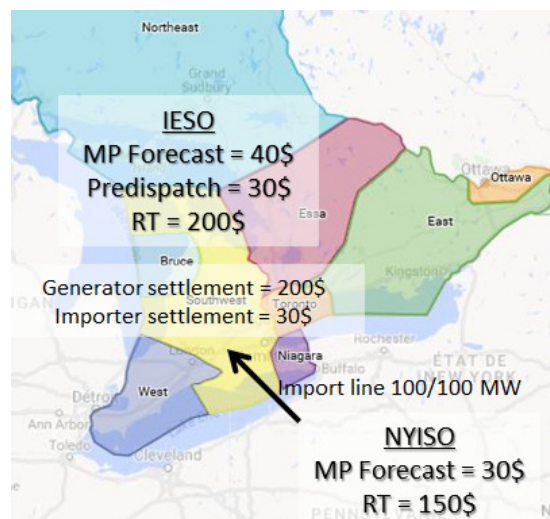
Exports are an efficient way to manage periods of surplus baseload generation and as imports are important for IESO market, exports from IESO to other neighboring jurisdictions are as important for them.

Example 4 – Settlement discrepancy between supply options

One of the goals of Market Renewal should be to maintain and improve the flexibility on the interties so that the interties can help to meet changing supply-demand conditions in Ontario. However, the congestion pricing proposal will reduce the flexibility on the interties because in situations of high uncertainty and volatility, the congestion pricing proposal provides an incentive for importers and exporters to reduce the amount of power flowing through the interties so as to avoid the financial penalties associated with a fully scheduled intertie. In other words, the Method 2 proposal incentivizes the inefficient scheduling of the interties.

Suppose a market participant forecasts IESO RT price at 40\$ and NYISO RT price at 30\$. According to the IESO, the market participant should offer power in IESO at 30\$, which is its expected cost in NYISO. The import line is fully scheduled and the PD price in IESO is 30\$. In real-time however, the situation changes and both markets value their power higher at 150\$ in NYISO and 200\$ in IESO. The importer will then pay 150\$ in NYISO and be rewarded only 30\$ in the IESO, although its offer was in line with IESO's preferred outcome. An internal generator who also offered in IESO at 30\$ would receive 200\$ per MW which is the value of their power, even if the generator had minimal marginal cost. The discrepancy between the settlements is unfair and discriminatory as the importer is offering as much value to the Ontario market as the generator.

The Method 2 proposal exposes the importer to a high level of risk without a commensurate level of possible reward. In this example, as shown in the following table, the importer lost \$120/MW because of the volatility in the market, but if the situation had followed the market participant forecast, the importers expected profit would only have been \$0/MW. Importers and exporters will be very reluctant to expose themselves to such high levels of risk when the possible rewards are so very limited.



	<u>Offer</u>	<u>Scheduled</u>	<u>Revenue</u>	<u>Cost per</u>	
	<u>Price</u>	<u>MW</u>	<u>per MW</u>	<u>MW</u>	<u>Total P&L</u>
Generator A	\$50	100	\$200	\$50	\$15,000
Generator B	\$200	100	\$200	\$200	\$0
Importer	\$30	100	\$30	\$150	-\$12,000

MAG would like to reiterate that importers/exporters face different risks than dispatchable generators/loads. First, the costs and benefits of the former are not known beforehand since the other jurisdiction's price is also not known. Secondly, by being scheduled one hour ahead for the whole next hour, importers and exporters face greater price risk. The market situation can greatly vary between the scheduling time and the delivery time. Generators and loads, settled on a five minute basis, can adapt quickly to market conditions while importers and exporters can't. The current proposal limits the exporter revenues by limiting the gains from a lower real-time price but allowing the risk coming from a higher real-time price, and vice versa for importers. We are not talking about a consistent price bias, only about the fact that even if on average forecasted prices are the same as real-time prices; it happens in every market that prices will go above and below forecasts.

IESO stated that a market participant can hedge its real-time risk by taking a day-ahead position, and then hedge its day-ahead risk with FTR. However, it is highly unlikely that all transactions will occur in day-ahead as power needs and intertie outages vary overtime. This assumption is very risky and it is therefore extremely important to establish a bulletproof real-time market, one that does not penalize market participants for responding to the need of the IESO to stabilize normal minute-to-minute fluctuations.

MAG strongly believes that real-time settlement should not be based on predictions. A market participant should not be disadvantaged compared to others if the IESO fails to produce an accurate forecast. It is worth to point out that US markets sometimes are not able to accurately forecast RT prices; however none of them will penalize market participants if the RT price is different than the forecasted price. Method 1 would lead to settlements in line with locational value near the interties.

As IESO single schedule market design evolves, we are starting to see resemblances with NYISO market:

- Zonal settlement for loads;
- Nodal settlement for generators;
- Intertie transactions scheduled hour-ahead based on bids, offers and market forecasts.

MAG would like IESO to provide more explanations as to why they are not proposing an intertie settlement methodology such as the one NYISO has implemented and how their proposal is better for IESO market participants.

Currently, IESO states that their methodology will price imports/exports in a manner consistent with generators/loads pricing. However, we feel that it is not the case and that an intertie should not be seen as an internal transmission line.

Conclusion

The current proposal for Intertie Congestion Pricing when the interties are fully scheduled will have the following consequences:

- Importers/Exporters will have a great incentive to reduce volume at the interties.
- Importers will have an incentive to increase their offer price (↗Ontario Price).

- Importers/Exporters will have a greater risk in most situations.

IESO seems to assume that the current market conditions are representative of the future ones, although adding a day-ahead market and this real-time intertie congestion pricing methodology will most likely change the dynamics. MAG believes market efficiency will be greatly reduced with the implementation of method 2 and thinks IESO should contact its neighboring jurisdictions/ISOs/RTOs before going forward as the volume at the interties may decrease significantly.

Following June 7th meeting, we feel we can agree with the four following principles. We had those principles in mind when we created the previous examples.

- 1- The new Real-Time market will need to be efficient and work properly on a stand-alone basis. The fact that there will be a Day-Ahead market should not influence the decision regarding the settlement method of intertie congestion.
- 2- In order to create correct incentives for intertie transactions, the IESO needs to look at the transactions as a whole and not only at the transaction on IESO's side. While implementing CTS transactions, NEISO, NYISO, PJM and MISO looked at the whole transaction to maximize the schedules and bring efficiency to the markets.
- 3- It is logic to think that a market participant losing money for a specific transaction on average will stop doing this transaction overtime. Market participants will only engage in transactions if they are able to generate positive returns.
- 4- If IESO prices are at 100 \$ and NYISO prices are at 20 \$ for an hour, the best possible outcome regarding the design of intertie flows would be for the import line to be fully scheduled. This was mentioned by IESO in a previous presentation.

As discussed in the meeting, we are still thinking about a third method that would be in line with IESO's concerns and market dynamics. However, as we have been working for years with NYISO, CAISO and other markets, we strongly feel that method 1 works very well and gives the right incentives to schedule intertie transactions.

Also, MAG would like to know what will happen with the intertie congestion collected in RT, either under method 1 or 2, as seen in the examples above. This money will not be distributed to TR holders as it is today. This could represent huge amounts that need to be thought of in this part of the process.

Should you have any further questions regarding this document, please feel free to contact me.

Sincerely,

Alexandre Villeneuve
Head Trader, MAG Energy Solutions