Long Term Solutions to Loop-Flow Concerns

- Contract Sink Pricing -

Robert Pike
New York Independent System Operator

Market Issues Working Group

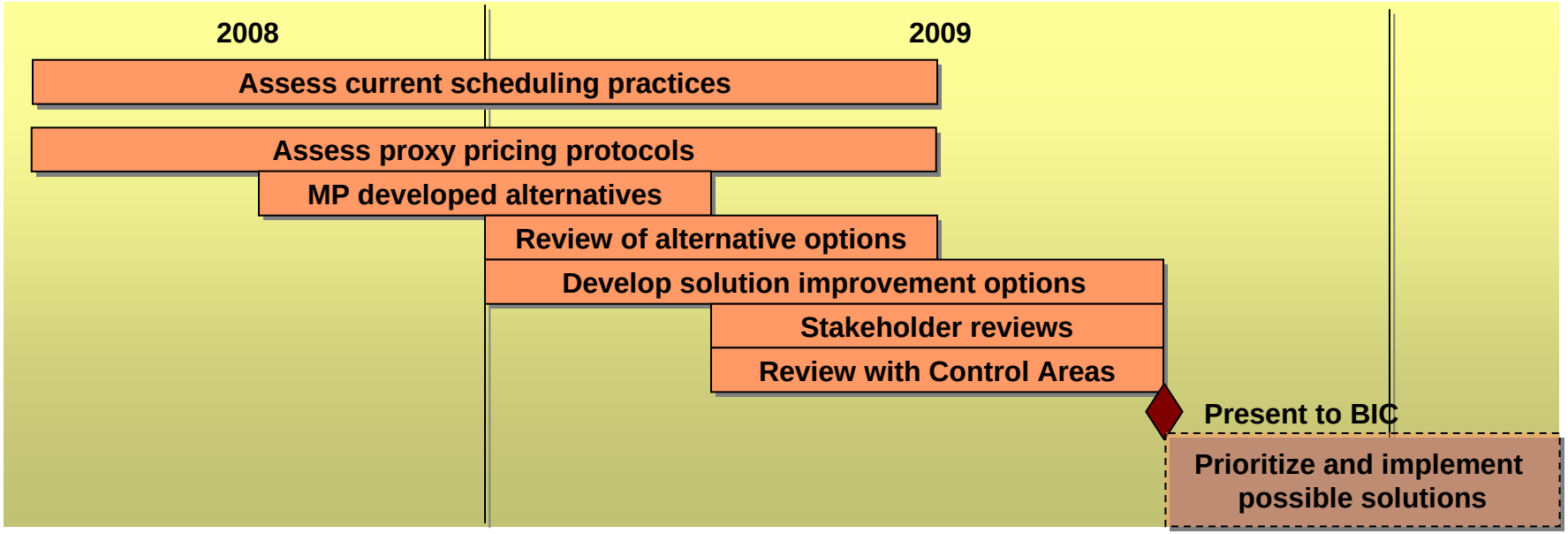
February 6, 2009

Discussion

- Review and establish thorough understanding of the existing issue and source of loopflows to facilitate examination of alternative proxy pricing methodologies.
- December 16, 2008 discussion
  - *Review of existing protocols and incentives for scheduling*
  - *Impact to existing protocols of controlling PARs*
- Today's discussion
  - *Review of contract sink pricing.*

Loop-Flow Solution Development

Description	Schedule
Assess proxy pricing protocols	Q2-2009
Market Participant developed alternative proposals	Q1-2009
Review alternative proposals	Q2-2009
Develop solution improvement options	Q3-2009
Stakeholder reviews	Q3-2009
Review options with control areas	Q3-2009
Present recommendations to BIC	Q3-2009



CONTRACT SINK PRICING

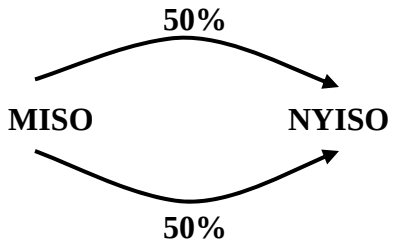
Under this approach, the NYISO would both model flow around Lake Erie to account for the current lack of OH-Mich PAR control and would model flows and price transactions based on the control area in which a transaction is scheduled to sink, rather than based upon the adjacent control area from which, or to which, the transaction enters or exists the NYCA.

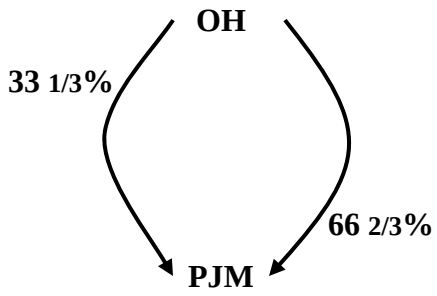
•Contract sink pricing requires consistency in modeling of transaction flows, congestion pricing and coordinated PJM-NYISO PAR operation.

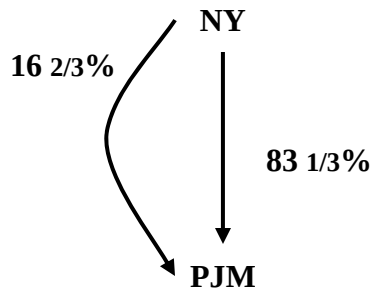
- PAR adjustment is utilized for direct PJM-NYISO transactions and is appropriate for indirect PJM-NYISO transactions. Is it still practical for:
  - MISO-NYISO?
  - Direct OH-NYISO?
- For the purpose of this presentation, it is assumed that all scheduled transactions results in adjustments to the NY-PJM PARs.

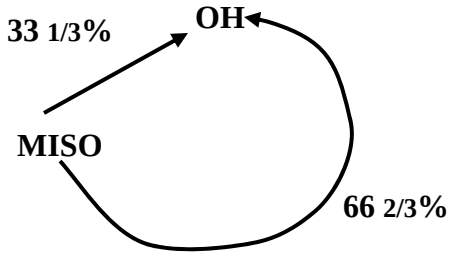
OVERVIEW

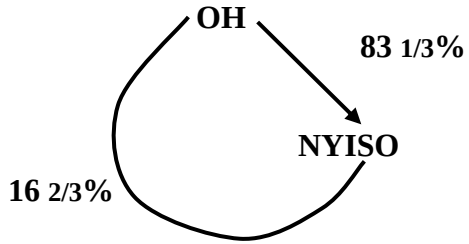
The following examples are based on the following distribution factors assuming the Ontario PARs not in operation.

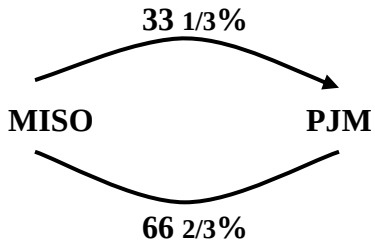






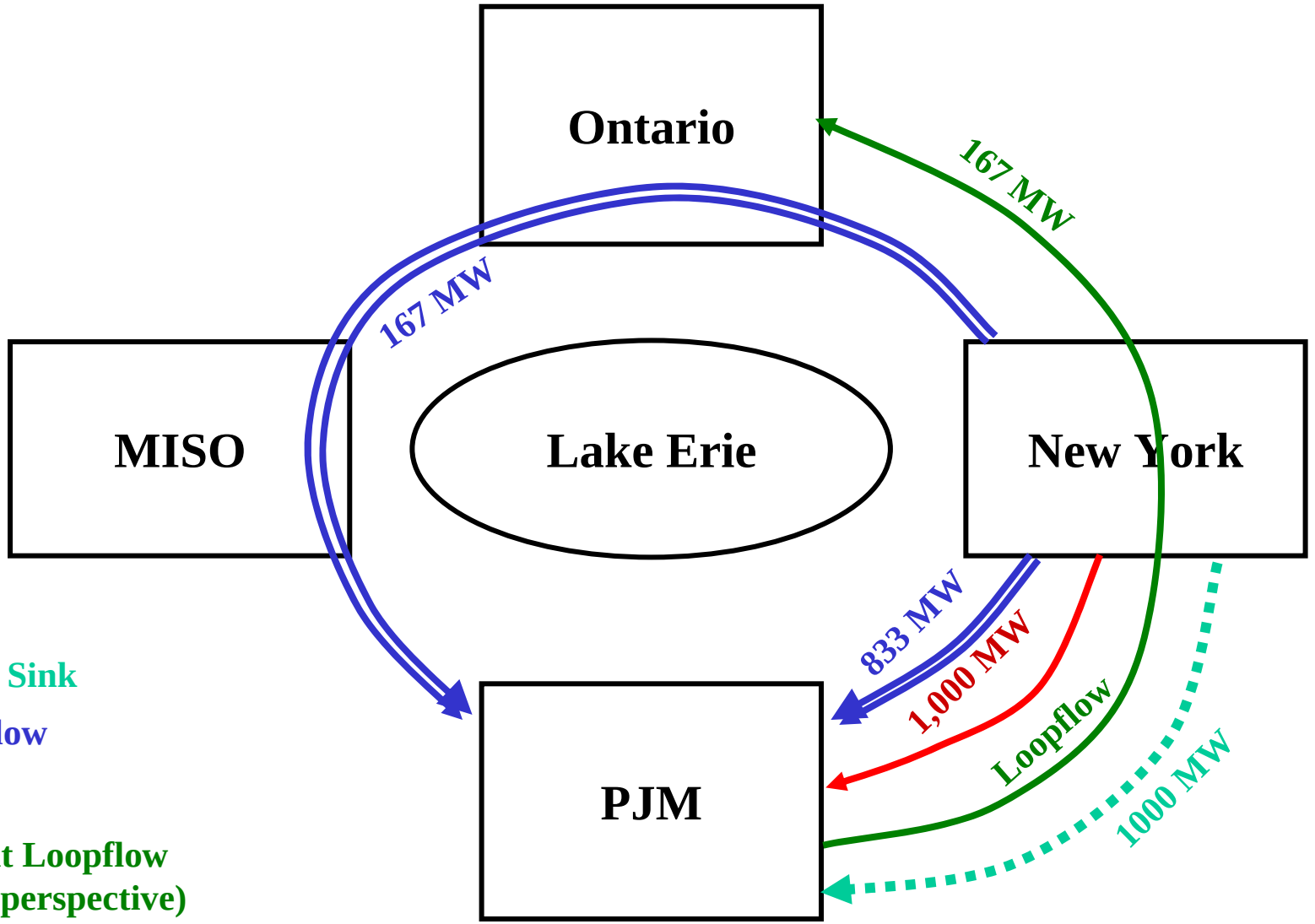






This Page Intentionally Left Blank

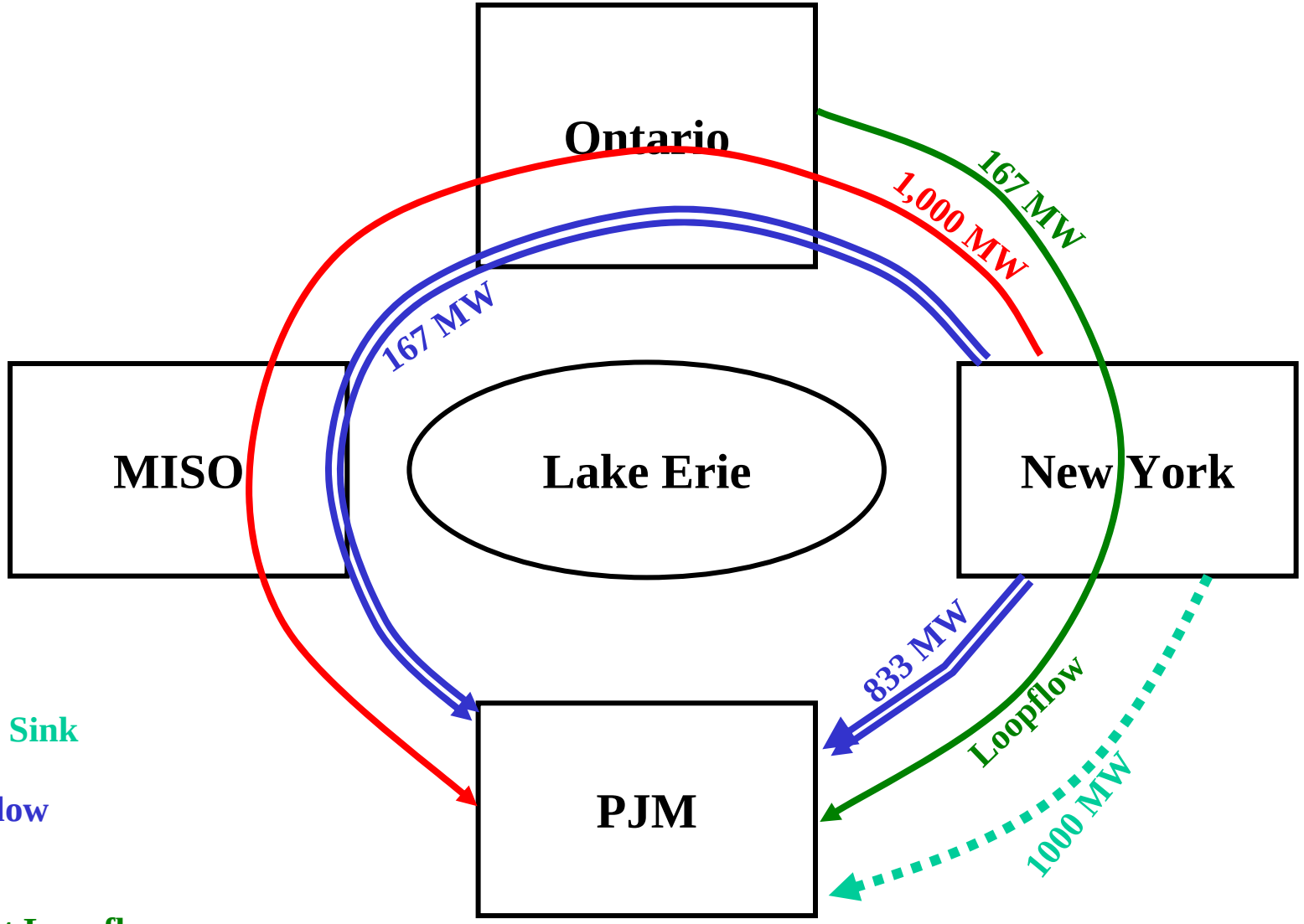
Direct NYISO-PJM Schedules
Contract Sink Model



NYISO-PJM

In this scenario the contract sink for a direct NYISO-PJM schedule is also the sink using the NYISO's current adjacent control area approach.

Indirect NYISO-PJM Schedules
Contract Sink Model



Contract Sink

Power Flow

Bid Path

Apparent Loopflow (NYISO perspective)

NYISO-PJM

The application of the contract sink pricing model to indirect schedules would more closely align the NYISO's interchange pricing model with the power flows associated with the indirect transaction schedules, reducing apparent loopflows from the standpoint of the NYISO.

- How much the application of contract sink pricing model would affect the profitability of scheduling indirectly would depend on how the NYISO modeled PAR schedules based on the level of indirect schedules.
  - To be effective at eliminating indirect scheduling, the PAR schedules between NYISO and PJM would need to be adjusted.

NYISO-PJM

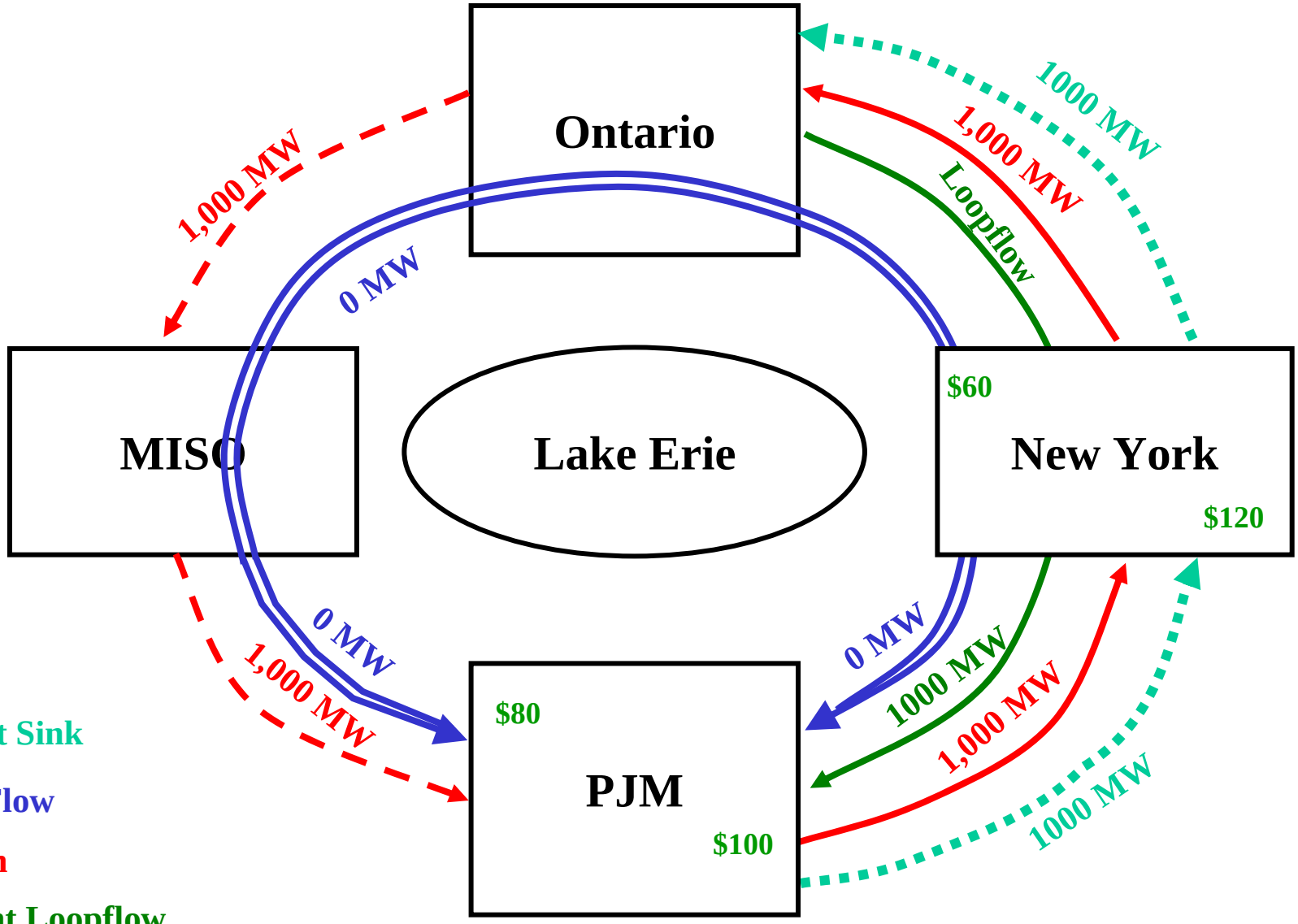
If the NYISO priced and managed indirect export transactions in the same manner as direct transaction, contract sink pricing would reduce the incentive to schedule indirect exports to PJM at times when Central East is binding with a substantial shadow price.

- Such a shift to contract sink pricing would correspondingly increase the price paid for exports to New York from PJM when Central East is binding.

If the incentive to schedule counterclockwise schedules arose solely from a combination of PJM's contract sink pricing and the lower NYISO price for exports sourced from the OH proxy bus, NYISO implementation of contract sink pricing would reduce the scheduling of counterclockwise wheels, without incentivizing the scheduling of chain transactions.

This Page Intentionally Left Blank

Counterclockwise NYISO-PJM Chain Schedules
Contract Sink Model

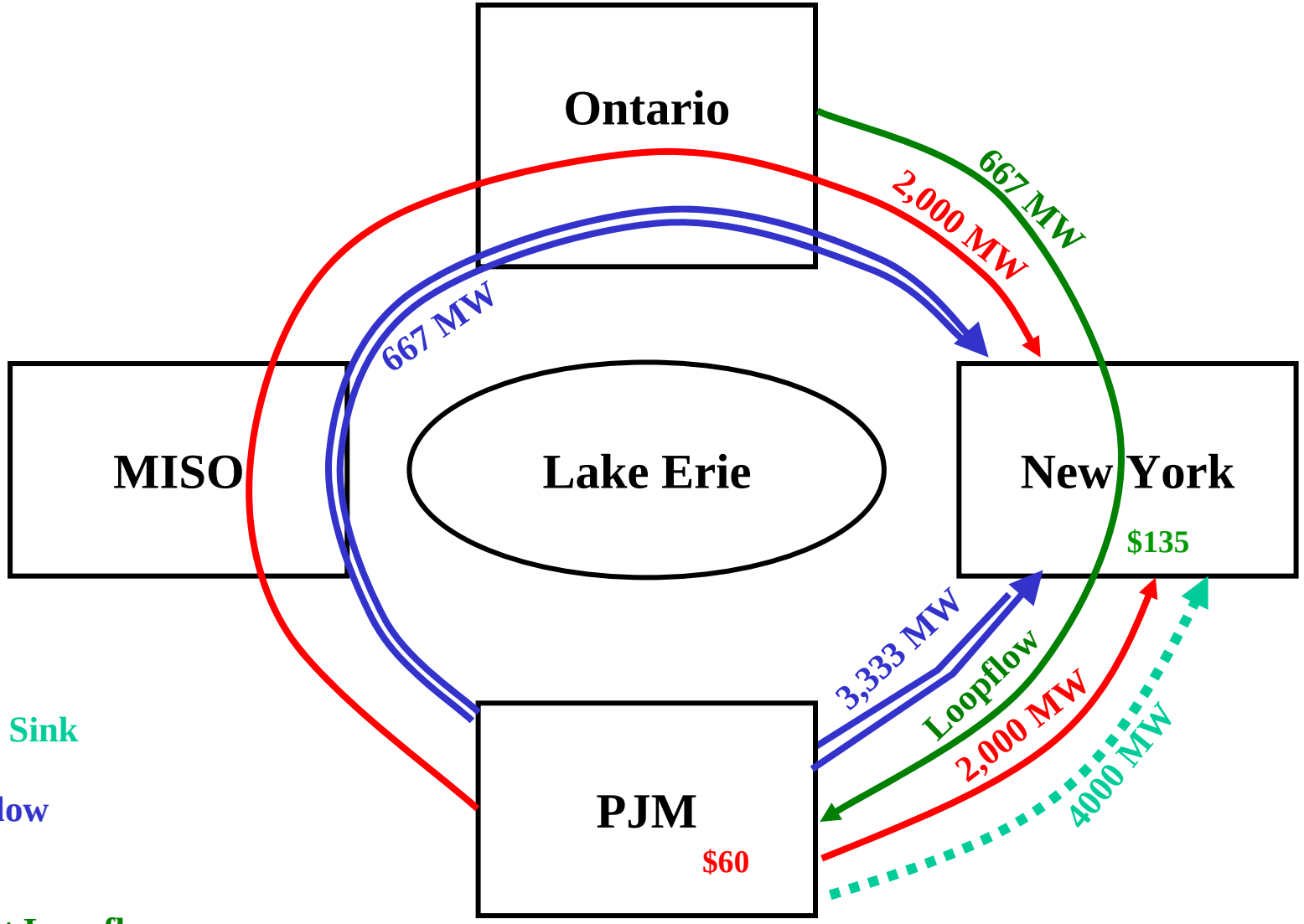


NYISO-PJM

If the incentive to schedule export transactions to PJM via the Ontario interface arose from the level of the NYISO OH proxy bus price relative to the PJM price, a financial incentive would exist for the scheduling of counterclockwise chain schedules.

- Increases in the NYISO price for indirect schedules to PJM could simply result in a shift to counterclockwise chain transactions.
- If market participants used counterclockwise chain schedules to deliver power from NYISO to PJM, there would again be clockwise loopflows.

Direct and Indirect NYISO-PJM Schedules
Contract Sink Model



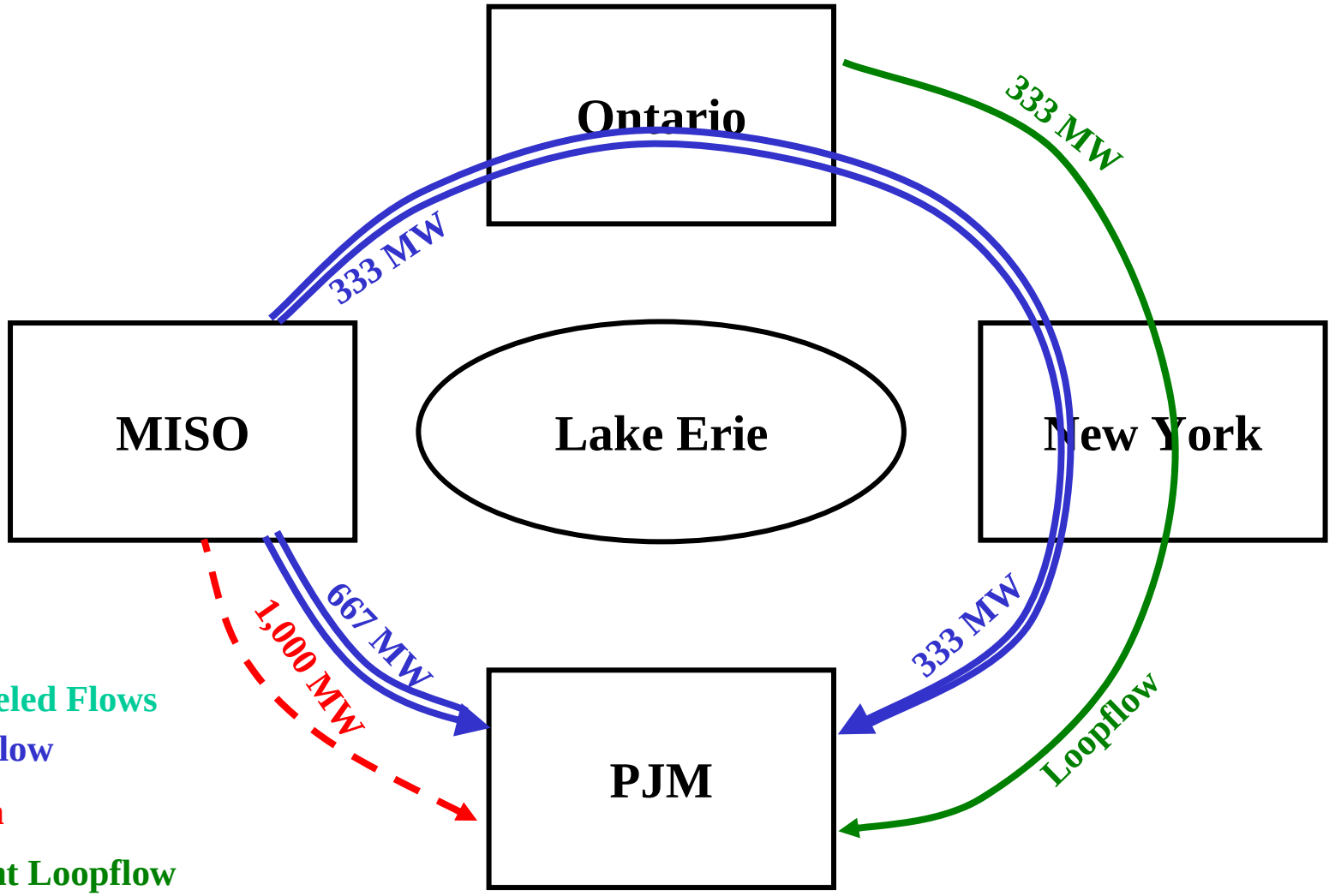
NYISO-PJM

- Managing reliability under a contract sink pricing model would require changes to the NYISO's management of schedules on the Ontario and PJM interfaces to avoid adverse reliability impacts when imports from PJM are profitable but need to be limited.
- The NYISO would need to shift to a system that enforced interface limits against flows calculated in a different manner than today.

PJM-MISO Scheduling

This Page Intentionally Left Blank

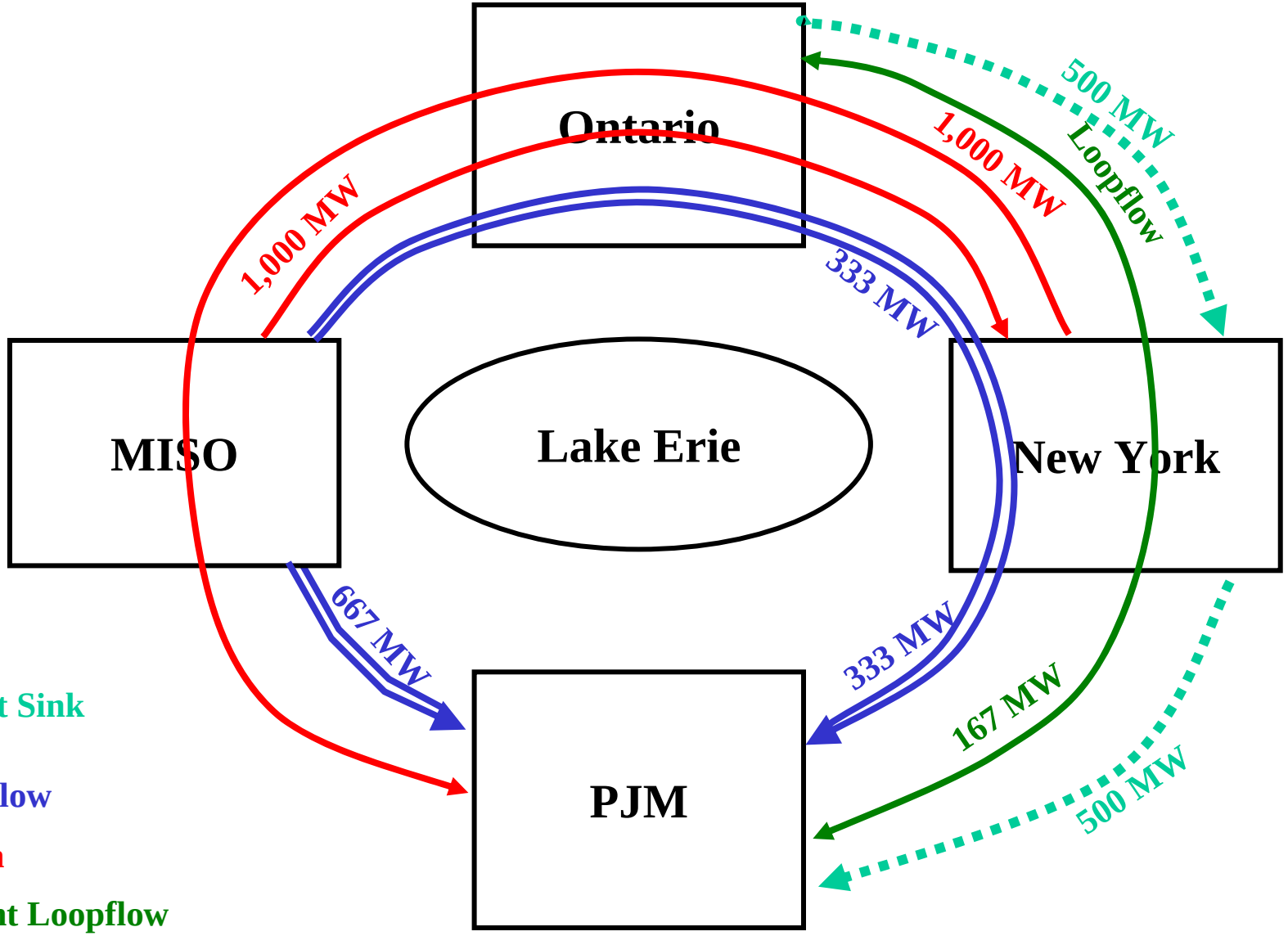
Direct MISO-PJM Schedules
Contract Sink Model



MISO-PJM

Since the NYISO is not on the contract path for a direct MISO-PJM transaction, switching to a contract sink model would not affect the NYISO's modeled flows nor the apparent loopflows through the NYISO resulting from these schedules.

MISO-PJM Offsetting Schedules
Contract Sink Model



Contract Sink

Power Flow

Bid Path

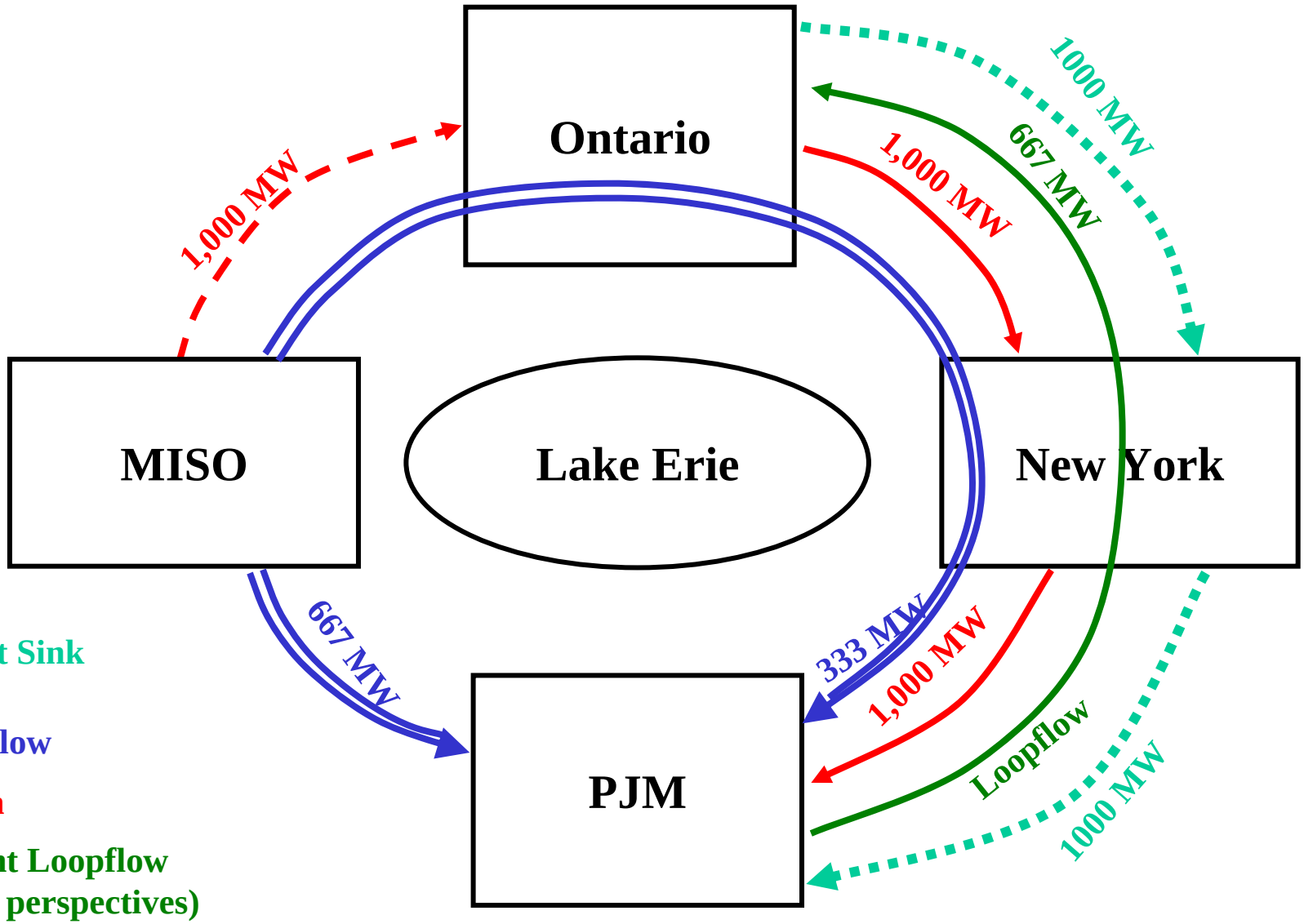
Apparent Loopflow (NYISO perspectives)

MISO-PJM

Applying the contract sink model to offsetting MISO-PJM schedules would align modeled flows with actual flows, reducing apparent loopflows from the standpoint of the NYISO.

- Under contract sink pricing, the NYISO prices for the MISO and PJM offsetting transactions would no longer be the same, reducing the incentive to schedule these transactions.

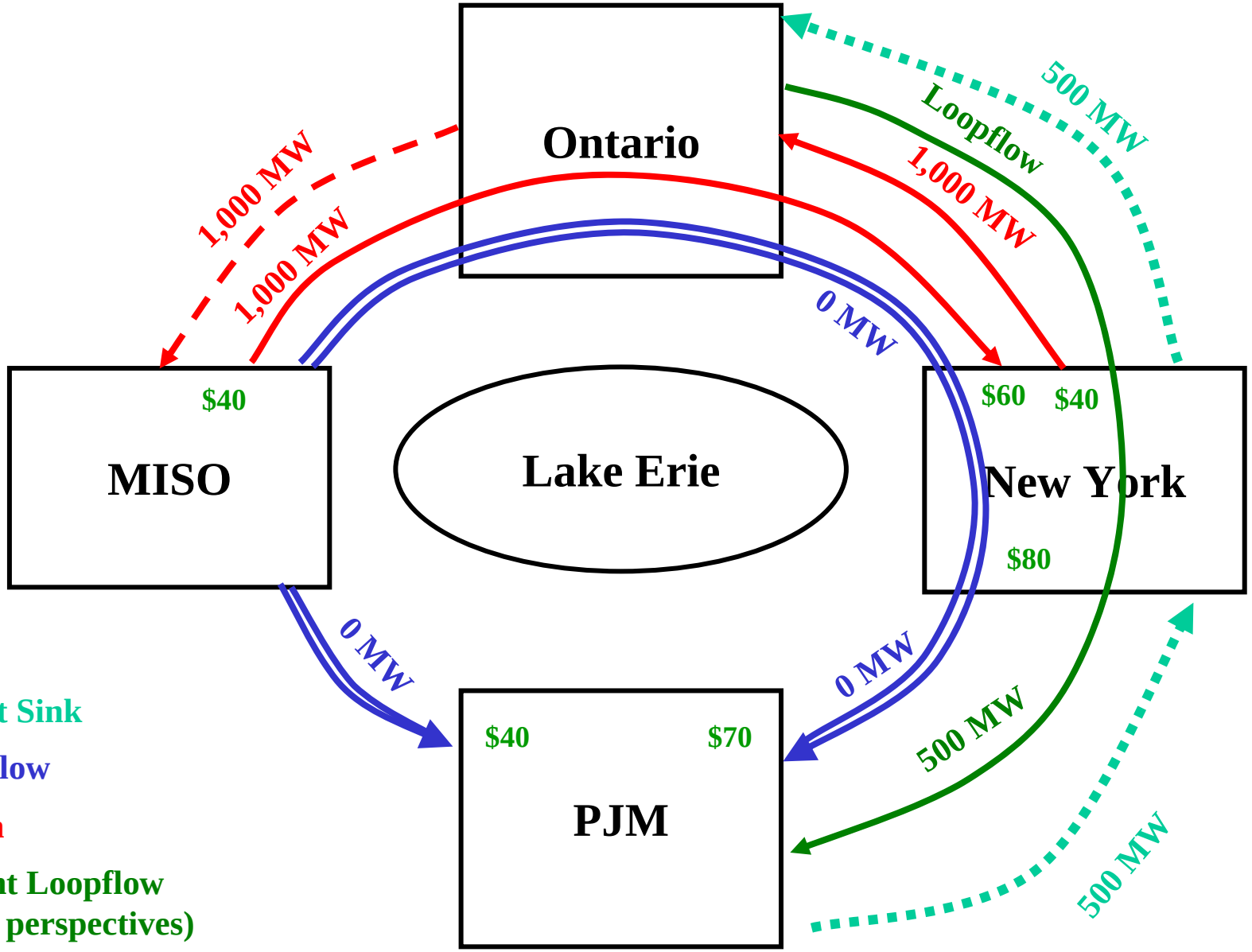
MISO-PJM Chain Schedules
Contract Sink Pricing



MISO-PJM

Applying contract sink pricing to chain schedules from MISO to IESO to NYISO to PJM would not result in any change relative to the NYISO's current method because both of the transactions visible to the NYISO sink in adjacent control areas.

Offsetting Chain Schedules
Contract Sink Pricing



CONTRACT SINK PRICING

Contract sink pricing could incent other kinds of offsetting transaction schedules between MISO and NYISO.

- Transactions sourced in MISO and sinking in New York would have a more favorable impact on central east than transactions sourced in Ontario. So if central east were binding, offsetting transactions could be scheduled under contract sink pricing that would produce no net power flows but dollar flows out of the NYISO.

CONTRACT SINK PRICING

Whether a NYISO shift to contract sink pricing would end the scheduling of indirect transactions would depend on assumptions used to price congestion, PAR management and impact of unseen transactions.

Regardless of whether the shift eliminated the scheduling of these indirect transactions:

- The shift would require other changes to the NYISO's scheduling and pricing to maintain reliability.
- The shift would expose the NYISO to other transaction scheduling patterns that could exploit a contract sink pricing system.

NEW YORK INDEPENDENT SYSTEM OPERATOR

The New York Independent System Operator (NYISO) is a not-for-profit corporation that began operations in 1999. The NYISO operates New York's bulk electricity grid, administers the state's wholesale electricity markets, and provides comprehensive reliability planning for the state's bulk electricity system.

www.nyiso.com