

IMO Market Evolution Program Day Ahead Market Project

Topic: Day Ahead Market - Allocation of Uplifts

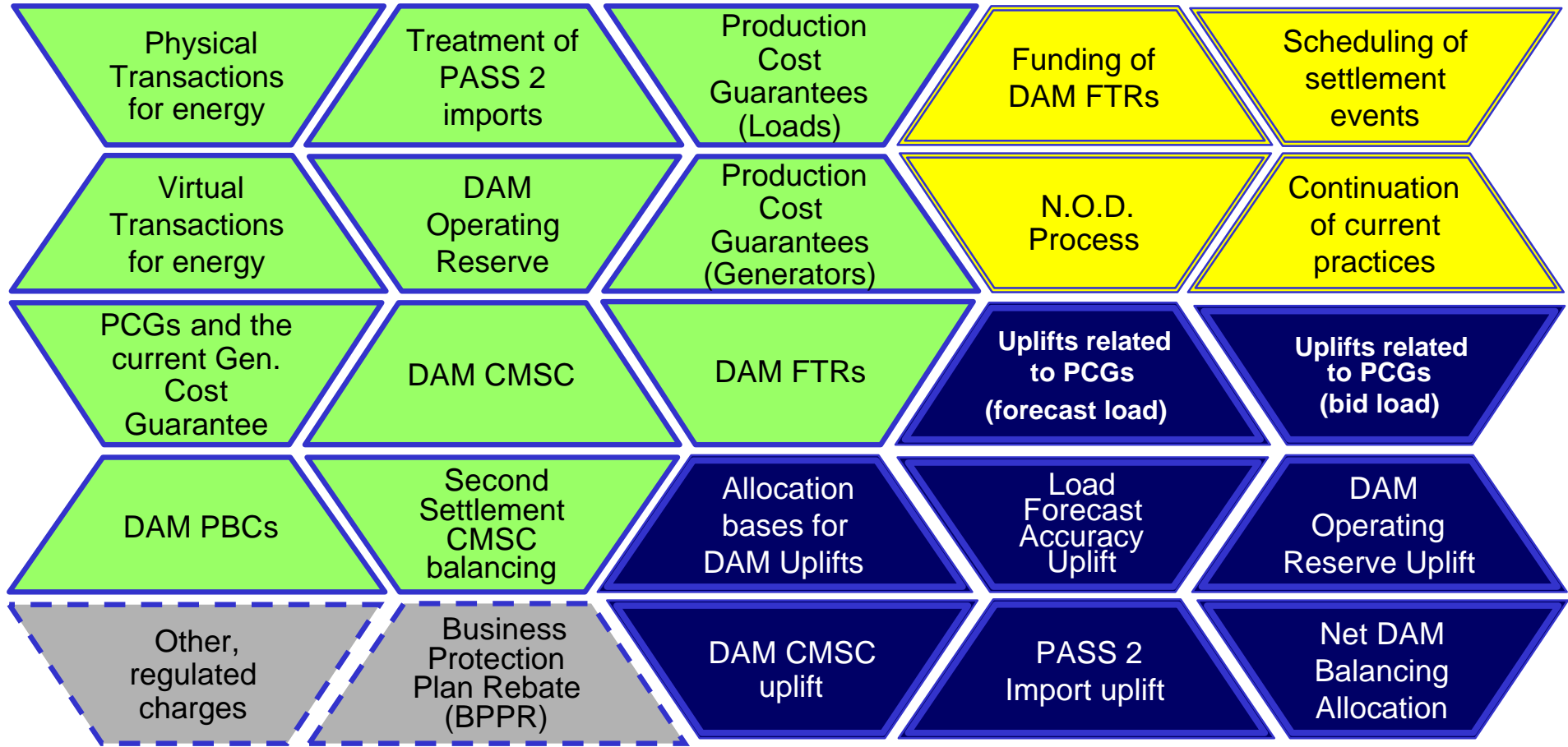
Presentation to the Commercial Reconciliation Sub-Committee

Tuesday, August 31, 2004

DAM Strawman - Settlements Topics

Settlements

Includes....

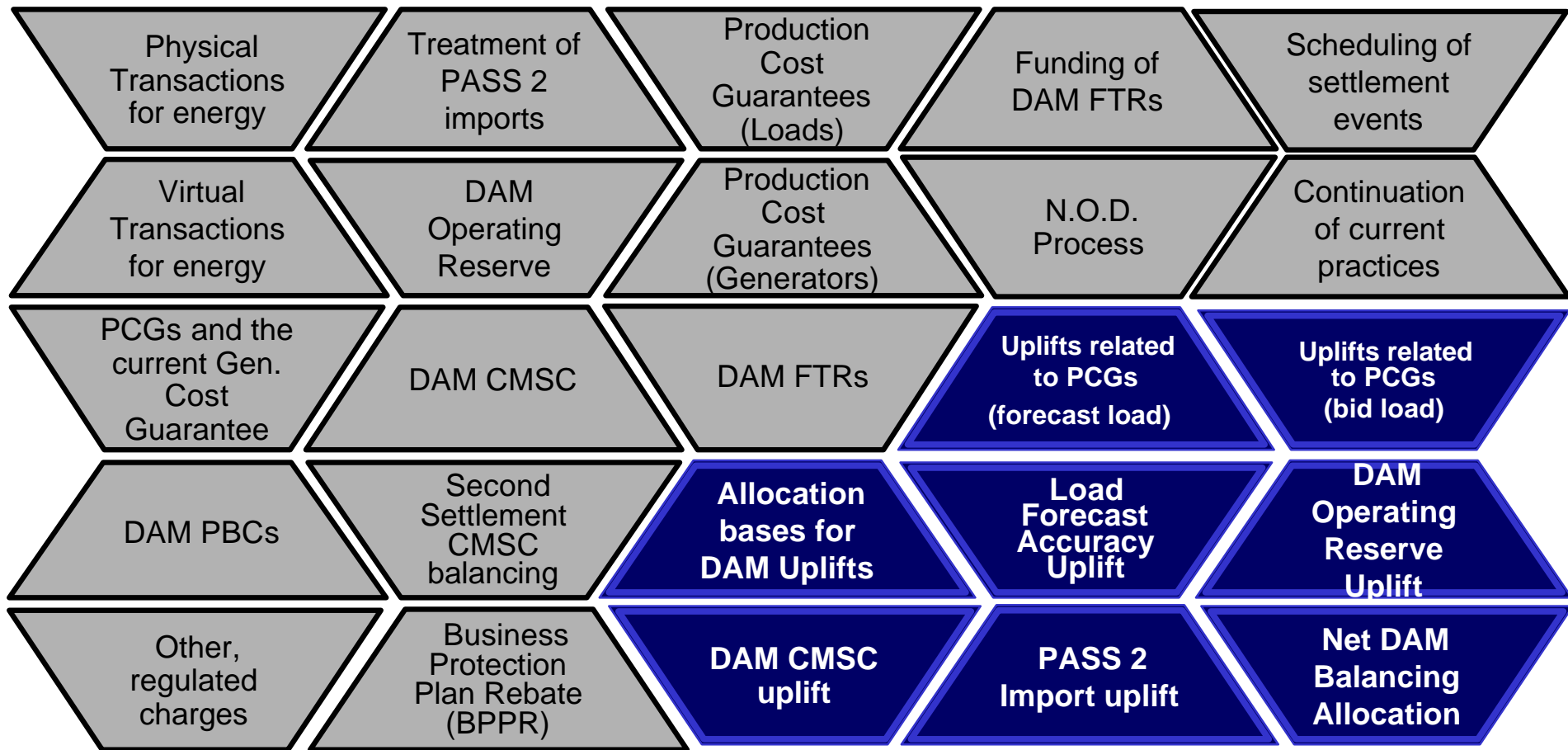


Legend:



Settlements

Settlements - Today's Discussion Topics



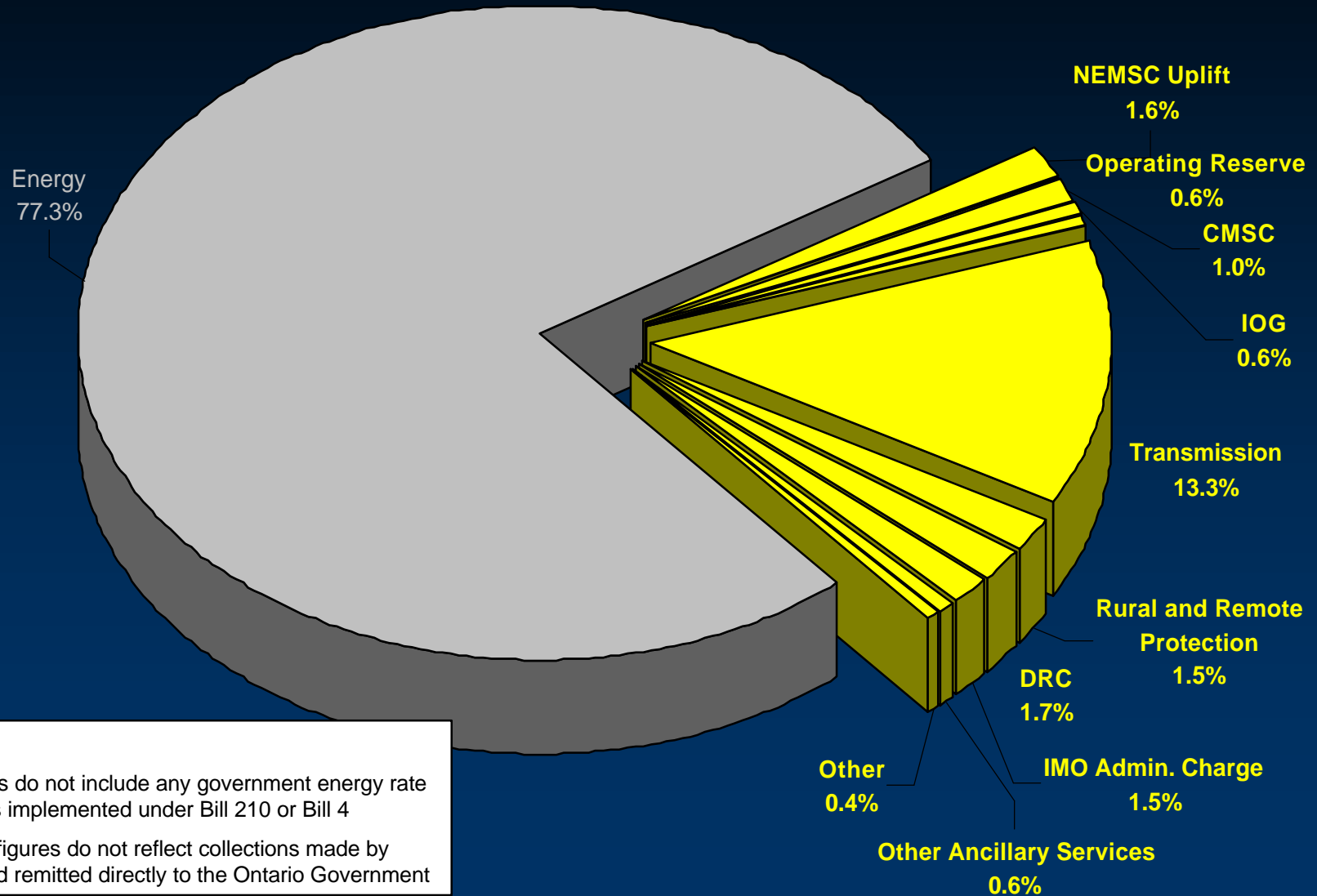
Today's Presentation:

- The **current** context of Cost Allocation in the IMO Administered Markets:
 - Financial Context
 - Decision-making Authority
 - Sources of common costs
 - Technical Aspects of Uplift Allocation
- Cost Allocation in the **future** context of the DAM:
 - Financial Context
 - Decision-making Authority
 - Sources of common costs
 - Technical Aspects of Uplift Allocation

The **current** context of Cost Allocation in the IMO Administered Markets:

Real-Time Market Financial Totals (May 1, 2003 - April 30, 2004)

Slightly over 20% of all financial volumes in today's IMO-administered markets involve the allocation of common costs using various methodologies.



Notes:

- 1) Figures do not include any government energy rate subsidies implemented under Bill 210 or Bill 4
- 2) DRC figures do not reflect collections made by LDCs and remitted directly to the Ontario Government

Decision-making Authority

- Cost Allocation methodologies currently in effect in today's real-time market are variously controlled from three different sources:
 - 1) The *IMO Market Rules*
 - 2) The Ontario Energy Board
 - 3) The Ontario Government (various branches)

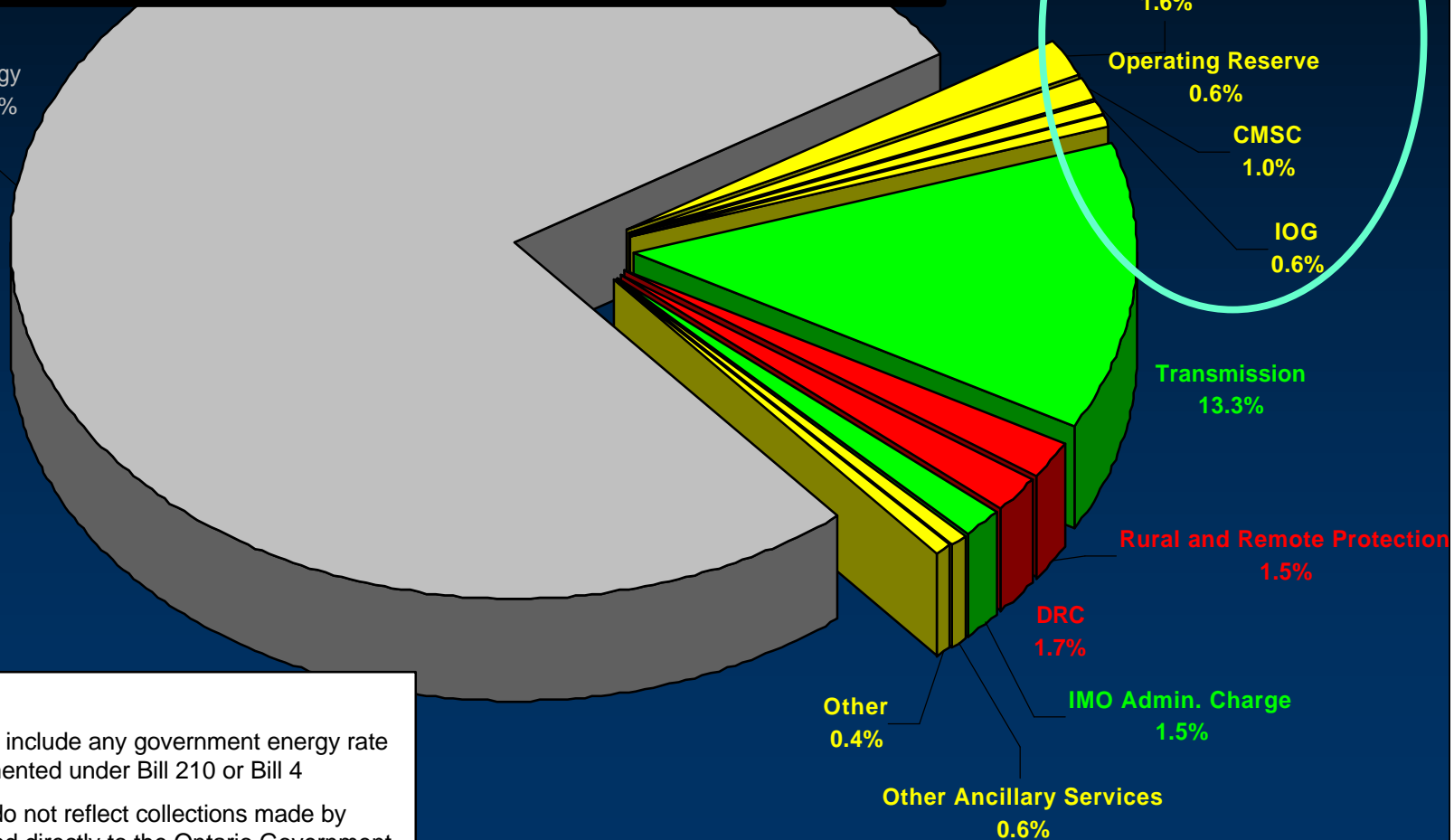
- Out of the +20% of financial volumes that are subject to some form of cost allocation in today's IMO-administered market only a small proportion (approximately 5% over the past year) is directly under the control of the *IMO Market Rules*

Real-Time Market Financial Totals (May 1, 2003 - April 30, 2004)

Legend:

- ▲ Cost Allocation under the direct authority of "IMO Market Rules"
- ▲ Cost Allocation Under the authority of the OEB
- ▲ Cost Allocation under the authority of the Ontario Government

Energy
77.3%



"hourly uplift"

NEMSC Uplift

1.6%

Operating Reserve

0.6%

CMSC

1.0%

IOG

0.6%

Transmission

13.3%

Rural and Remote Protection

1.5%

DRC

1.7%

IMO Admin. Charge

1.5%

Other Ancillary Services

0.6%

Other

0.4%

Notes:

- 1) Figures do not include any government energy rate subsidies implemented under Bill 210 or Bill 4
- 2) DRC figures do not reflect collections made by LDCs and remitted directly to the Ontario Government

Sources of common costs

- The ~5% of financial volumes which represent cost allocation decisions reflected within the IMO Market Rules can be broken down into 3 major categories as follows:

- (3.8% approx.) 1) Hourly Uplift (IMO Market Rules reference: ch. 9, section 3.9.1)
- (0.6% approx.) 2) Other Ancillary Services (IMO Market Rules reference: ch. 9, section 4.2)
- (0.4% approx.) 3) Other Common Costs (IMO Market Rules reference: ch. 9, section 4.8)

- **Within each of the above groupings...**

- The sources of each individual cost component may vary
- The methodology for cost allocation is identical for all cost components that are included
- The IMO remains financially neutral with respect to the recovery of all costs

1) Hourly Uplift: components and principal cost drivers

•NEMSC Balancing Component:

- Ensures the financial neutrality of the market for all quantity differences - valued at a common reference price
- **Cost drivers:** Energy Price, Aggregate Market Trading Volumes

•Intertie Offer Guarantee Component:

- Stop-loss guarantee for import transactions
- **Cost drivers:** Energy Price differences between pre-dispatch and real-time, Aggregate Market Trading Volumes

•Operating Reserve Component:

- Ensures the financial neutrality of the market for all real-time operating reserve purchases
- **Cost drivers:** O.R. Price, O.R. Requirements

1) Hourly Uplift: components and principal cost drivers (continued)

•CMSC Component:

- Ensures the financial neutrality of the market for all real-time operating Congestion Management Settlement Credits
- **Cost drivers:**
 - Energy Price, Aggregate Market Trading Volumes, Differences between constrained and unconstrained energy schedule
 - O.R. Price, O.R. Requirements, Congestion related to the provision of O.R.
 - Market Participant bidding/offering behaviour

2) Other Ancillary Services : components and principal cost drivers

- **Reliability Must Run Component**
- **Black Start Component**
- **Regulation Component**
 - Ensures the financial neutrality of the market for all additional ancillary services procured by the IMO-administered markets through contractual arrangements
- **Cost drivers:**
 - contractual arrangements

3) Other Other Common Costs

- Reimbursement of costs for interconnection tests
- Reimbursement of outage recalls tests

- Reimbursement of Additional Market Suspension Costs
- Emergency Energy
- Market Clearing Account Borrowing Costs

- Generation Station Service

- Hour-Ahead Dispatchable Load Program
- Generation Cost Guarantee Program

Cost drivers:

- Activities to support reliability

Cost drivers:

- Anomalous Events

Cost drivers:

- Overall market uplift costs

Cost drivers:

- Program Participation

Technical Aspects of Uplift Allocation

- Within each grouping, the cost allocation methodology is the same...

1) Hourly Uplift:

Activity Base: all energy withdrawals (including exports)

Time Resolution: During the hour that the costs were incurred

Physical Bilateral Contract Transfer Capability: Some or all components can be allocated from the *buying market participant* to the *selling market participant* in proportion to the size of the contract

2) Other Ancillary Services:

Activity Base: all energy withdrawals (including exports)

Time Resolution: During the month that the costs were incurred

3) Other Common Costs:

Activity Base: all energy withdrawals (including exports)

Time Resolution: During the month that the costs were incurred

Cost Allocation in the **future** context of the DAM:

Today's Presentation:

- The **current** context of Cost Allocation in the IMO Administered Markets:
 - Financial Context
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 - Technical aspects of Uplift Allocation
- Cost Allocation in the **future** context of the DAM:
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Financial Context

Financial Context

In terms of existing uplift amounts in today's real-time market, the DAM will have the most impact on those charges falling within the hourly uplift category will have the greatest impact

1) Hourly Uplift:

DAM Impact: All components affected

2) Other Ancillary Services:

DAM Impact: No direct impact - although some contractual obligations may need to account for the DAM.

3) Other Common Costs:

DAM Impact: Some cost components may be affected

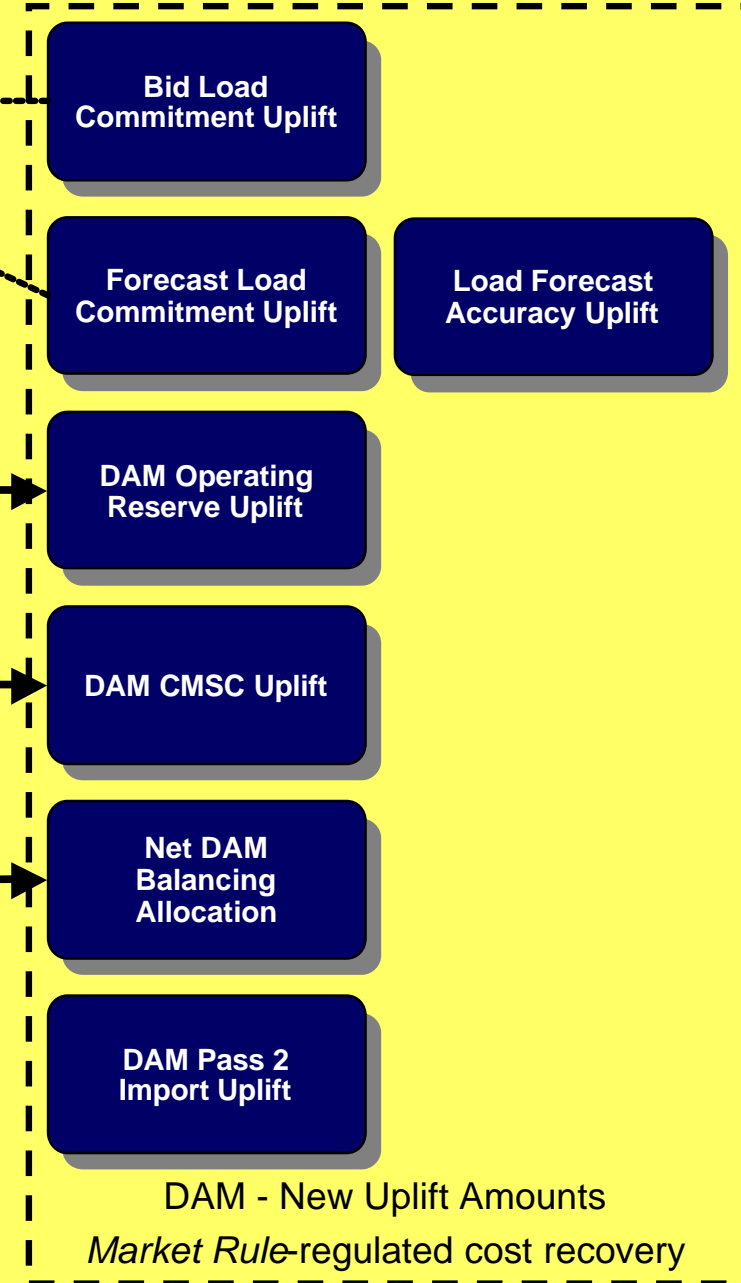
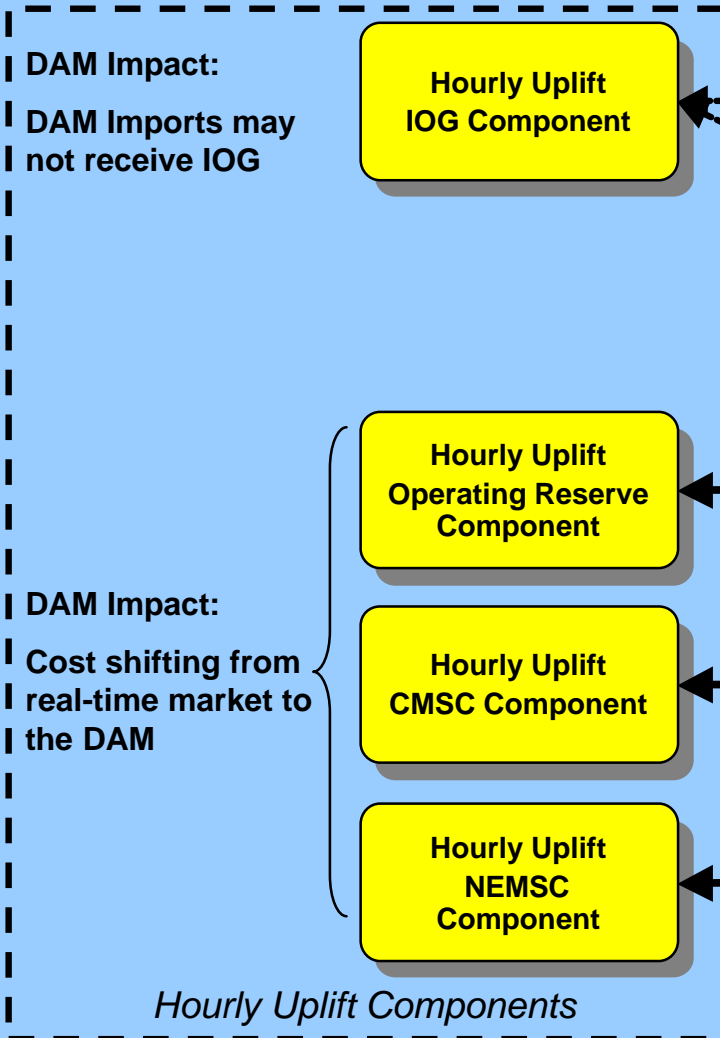
Financial Context

DAM Impact on Hourly Uplift:

- Some components of today's *hourly uplift* serve the same purpose as a new DAM uplift in terms of type of costs being recovered - specifically:
 - CMSC Component
 - NEMSC (Balancing) Component
 - Operating Reserve Component
- In addition, the IOG component of *hourly uplift* will correspondingly be reduced with the proportion of import transactions conducted in the DAM.
- Design Decision: It remains to be determined how today's real-time *hourly uplift* components will be merged with their DAM counterparts

Current, real-time market

DAM



Legend:

- Indirect Impact
- Identical Counterparts between DAM and RTM

Hourly Uplift
IOG Component

Hourly Uplift
Operating Reserve
Component

Hourly Uplift
CMSC Component

Hourly Uplift
NEMSC
Component

Bid Load
Commitment Uplift

Forecast Load
Commitment Uplift

DAM Operating
Reserve Uplift

DAM CMSC Uplift

Net DAM
Balancing
Allocation

DAM Pass 2
Import Uplift

Load Forecast
Accuracy Uplift

Hourly Uplift Components

DAM - New Uplift Amounts
Market Rule-regulated cost recovery

Decision-Making Authority

- All of the new DAM uplift amounts will be subject to the *IMO Market Rules*
- Like the real-time market, the *IMO Market Rules* do not determine the allocation of administrative costs related to operating the DAM itself (OEB jurisdiction)

Sources of common costs

Sources of common costs

Bid Load
Commitment Uplift

Forecast Load
Commitment Uplift

Load Forecast
Accuracy Uplift

- 3 new DAM uplift amounts are related to a new system of Production Cost Guarantees (PCGs) which will be implemented in the DAM
- The purpose of these three uplift amounts is to allocate PCG costs to various, identifiable segments of the market for whom the costs were incurred
- As mentioned earlier, these PCG uplifts do not have an identical relationship to any existing settlement amounts in the real-time market.
- PCGs do however, have a similar objective as the current real-time market *Generation Cost Guarantee Program*. As a result, there may be some cost shifting between the Generation Cost Guarantee Program and PCGs

Sources of common costs

Bid Load
Commitment Uplift

Forecast Load
Commitment Uplift

Load Forecast
Accuracy Uplift

Together, the set of 3 DAM PCG-related uplifts ensures that the cost allocation of any reliability commitments consider:

- 1) Commitments were made for those loads not represented in the DAM
- 2) Any commitments shifted from the Bid Load Pass (PASS 1) to the Forecast Load Pass (PASS 2) due to the presence of *virtual transactions*; and
- 3) The accuracy of the IMO load forecast

Sources of common costs

Bid Load Commitment Uplift

- Ensures the financial neutrality of the IMO-administered markets for all DAM PCG costs OTHER THAN those related to meeting Forecast Load in PASS 2 of the DAM Calculation Engine
- All PCG commitments recovered through this uplift are in response to market-based demand (i.e. to the exclusion of load not participating in the DAM)
- **Cost drivers:**
 - The reliability objectives of the DAM
 - DAM Participation Levels
 - DAM Prices and schedules
 - Costs offered into the DAM by generators, imports and *price responsive loads*

Sources of common costs

Forecast Load Commitment Uplift

- Ensures the financial neutrality of the IMO-administered markets for all DAM PCG costs related to meeting Forecast Load in PASS 2 of the DAM Calculation Engine
- All PCG commitments recovered through this uplift are in response to forecast demand not participating in the DAM
- Also includes commitments that would have been otherwise made in PASS 1 in the absence of virtual offers
- **Cost drivers:**
 - The reliability objectives of the DAM
 - DAM Participation Levels
 - DAM Prices and schedules
 - **Volume of Virtual Transaction Offers**
 - Costs offered into the DAM by generators, imports and *price responsive loads*

Sources of common costs

Load Forecast Accuracy Uplift

- Separate identification of PCG over-commitments made due to forecast load error
- The costs of these over-commitments are removed from the Forecast Load Commitment Uplift and recovered through the Load Forecast Accuracy Uplift
- Ensures that market participants NOT represented in the DAM are not held solely responsible for forecast load PCG commitments made in PASS 2 of the DAM Calculation Engine.
- **Cost drivers:**
 - Only present where the forecast load for a given hour in the next day exceeds the actual load that materializes in the corresponding hour

Sources of common costs

DAM Operating Reserve Uplift

- Recovers the cost of all operating reserve transacted in the DAM

Cost drivers:

- DAM O.R. prices and schedules
- DAM Participation Levels
- O.R. Requirements
- Inverse relationship to the size of real-time operating reserve uplift (i.e. a cost-shift relationship between the DAM and real-time markets)

Sources of common costs

DAM CMSC Uplift

- Recovers the cost of:
 - 1) DAM CMSC payments; and
 - 2) DAM CMSC second settlement balancing amounts
- Cost drivers:**
 - DAM prices and schedules (energy and operating reserve)
 - DAM Participation Levels
 - Market Participant bidding/offering behaviour

Sources of common costs

Net DAM Balancing Allocation

- Ensures the financial neutrality of DAM for all quantity differences due to:
 - 1) Quantity differences between injections and withdrawals scheduled by the DAM Calculation Engine in PASS 3
 - 2) Quantity differences associated with settling virtual transactions using PASS 5 quantities and settling physical transactions using PASS 3 quantities.
 - 3) Quantity differences associated with settling physical transactions for *price sensitive loads* using PASS 5 quantities and settling other physical transactions using PASS 3 quantities.
- Like today's *hourly uplift*, all quantity differences are valued at the Ontario uniform price determined in the DAM.

Cost drivers:

- Modeling of Losses in the DAM Calculation Engine)
- Differences between constrained (PASS 3) and unconstrained (PASS 5) components of the DAM Calculation Engine

Sources of common costs

DAM Pass 2 Import Uplift

- Recovers the cost of imports that are required for reliability purposes (in PASS 2 of the DAM Calculation Engine) AND fail clear the market-based PASS 3

Cost drivers:

- Import commitments required for reliability purposes (PASS 2), but not otherwise economic in PASS 3 of the DAM Calculation Engine
- The difference between:
 - 1) the DAM price at which the imports were effectively purchased; and
 - 2) the real-time price at which the import were effectively sold.

Technical Aspects of Uplift Allocation

Technical Aspects of Uplift Allocation

Uplifts Related to Production Cost Guarantees:

Time Resolution: DAILY

Incorporates existing real-time cost allocation mechanisms?: NO

Financial Neutrality:



Technical Aspects of Uplift Allocation

Uplifts Related to Production Cost Guarantees:

Allocation Base:

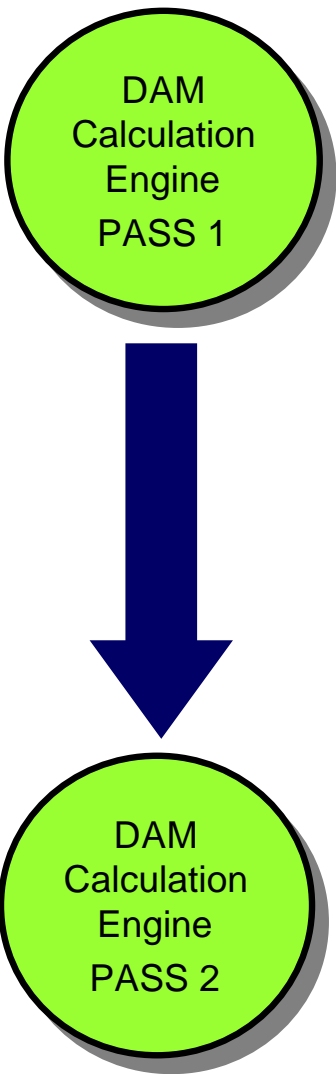
PCG Uplift Amounts, make use of two different allocation bases:

Allocation Base 1: All energy withdrawn from the IMO-administered markets; and

Allocation Base 2: Two sub-parts:

- 1) All energy withdrawn from the IMO-administered markets that was not covered by a DAM position;
- 2) Virtual Transactions to sell energy

Technical Aspects of Uplift Allocation



DAM
Calculation
Engine
PASS 1

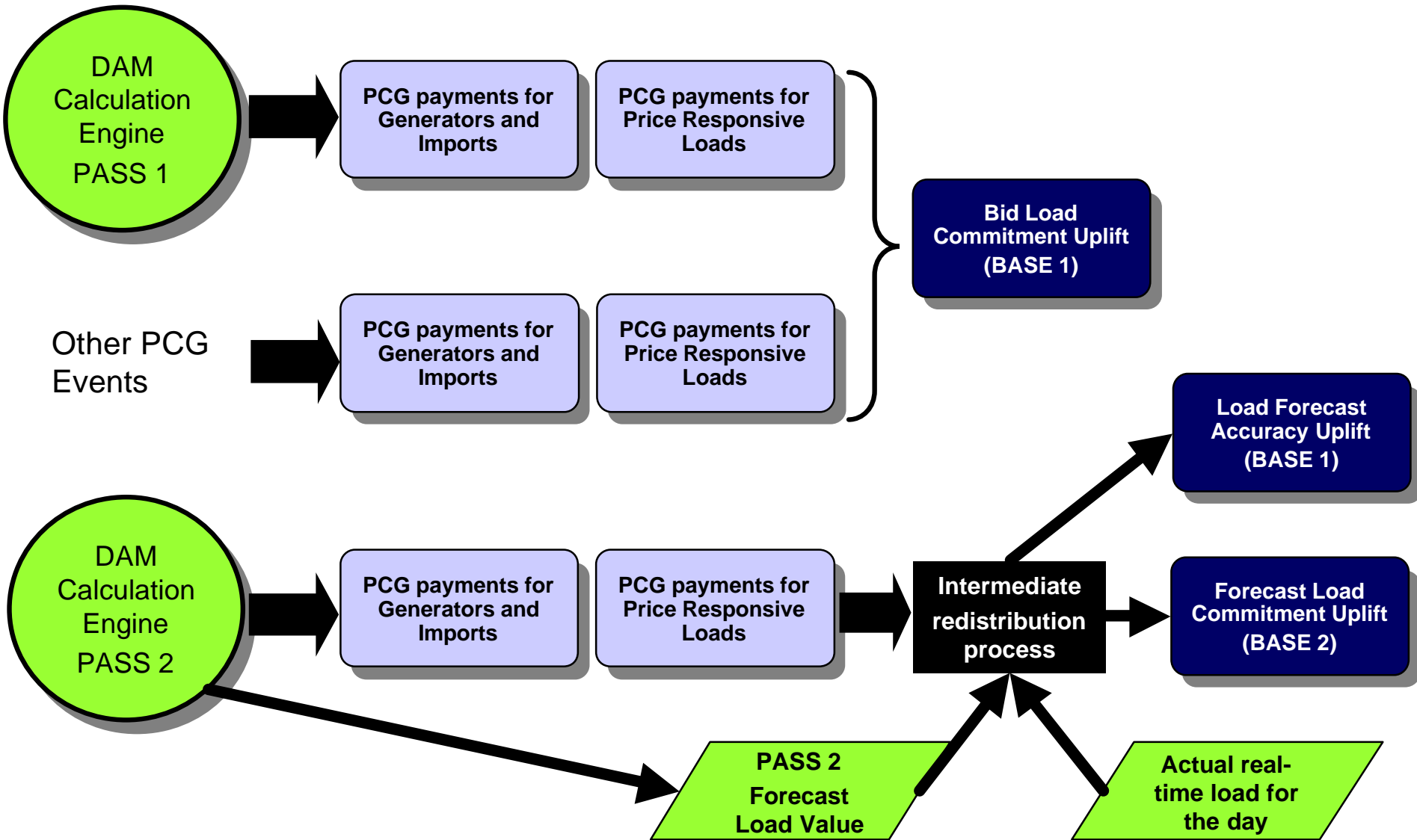
PASS 1:

- PCG Commitments made to satisfy load bid into the DAM
- Recall:
 - Within PASS 1 physical transactions are considered alongside virtual transactions
 - This raises the possibility that PASS 1 will displace commitment of physical generation and load reduction capability due to the presence of virtual transactions to sell energy.

PASS 2:

- PCG Commitments to satisfy forecast load
- Reflective of commitments that were NOT made in PASS 1 due to the presence of virtual transactions in PASS 1

Technical Aspects of Uplift Allocation



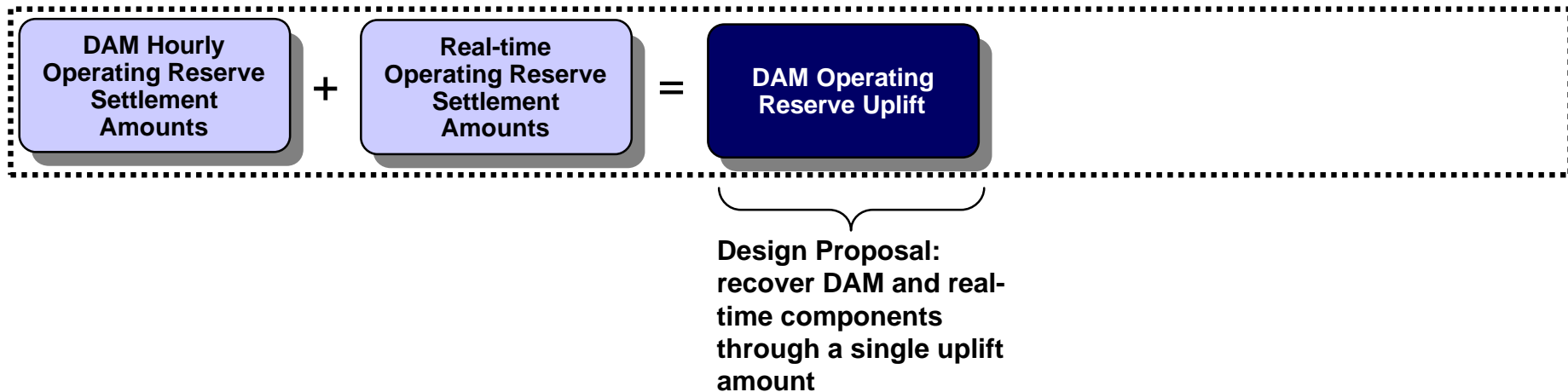
Technical Aspects of Uplift Allocation

Uplifts Related to Operating Reserve:

Time Resolution: HOURLY

Incorporates existing real-time cost allocation mechanisms?: YES
(includes existing operating reserve component of *hourly uplift*)

Financial Neutrality:



Allocation Base 1: All energy withdrawn from the IMO-administered markets

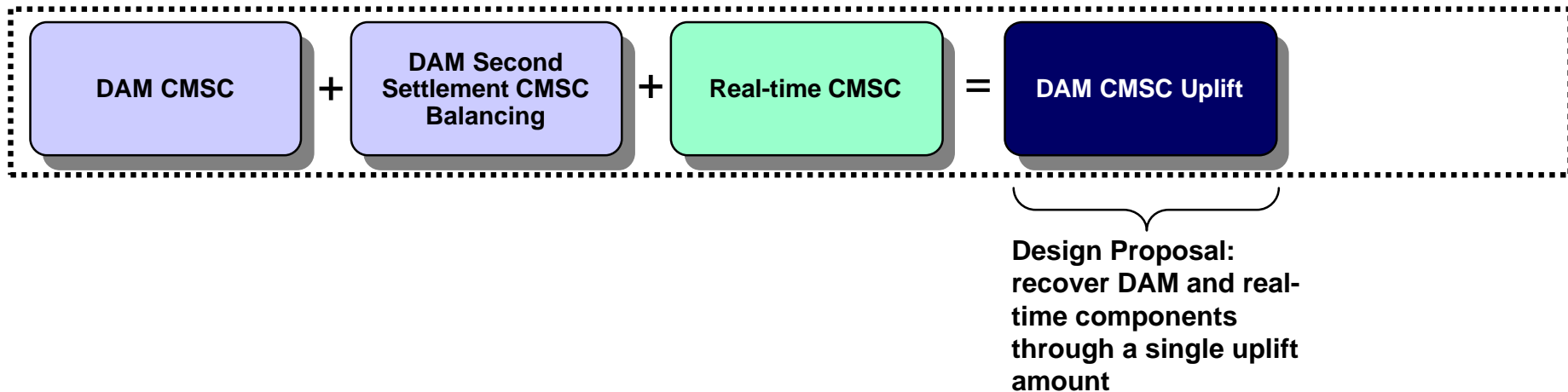
Technical Aspects of Uplift Allocation

Uplifts Related to Congestion Management:

Time Resolution: HOURLY

Incorporates existing real-time cost allocation mechanisms?: YES
(includes existing CMSC component of *hourly uplift*)

Financial Neutrality:



Allocation Base 1: All energy withdrawn from the IMO-administered markets

Technical Aspects of Uplift Allocation

Uplifts Related to Market Balancing (“Net DAM Balancing Allocation):

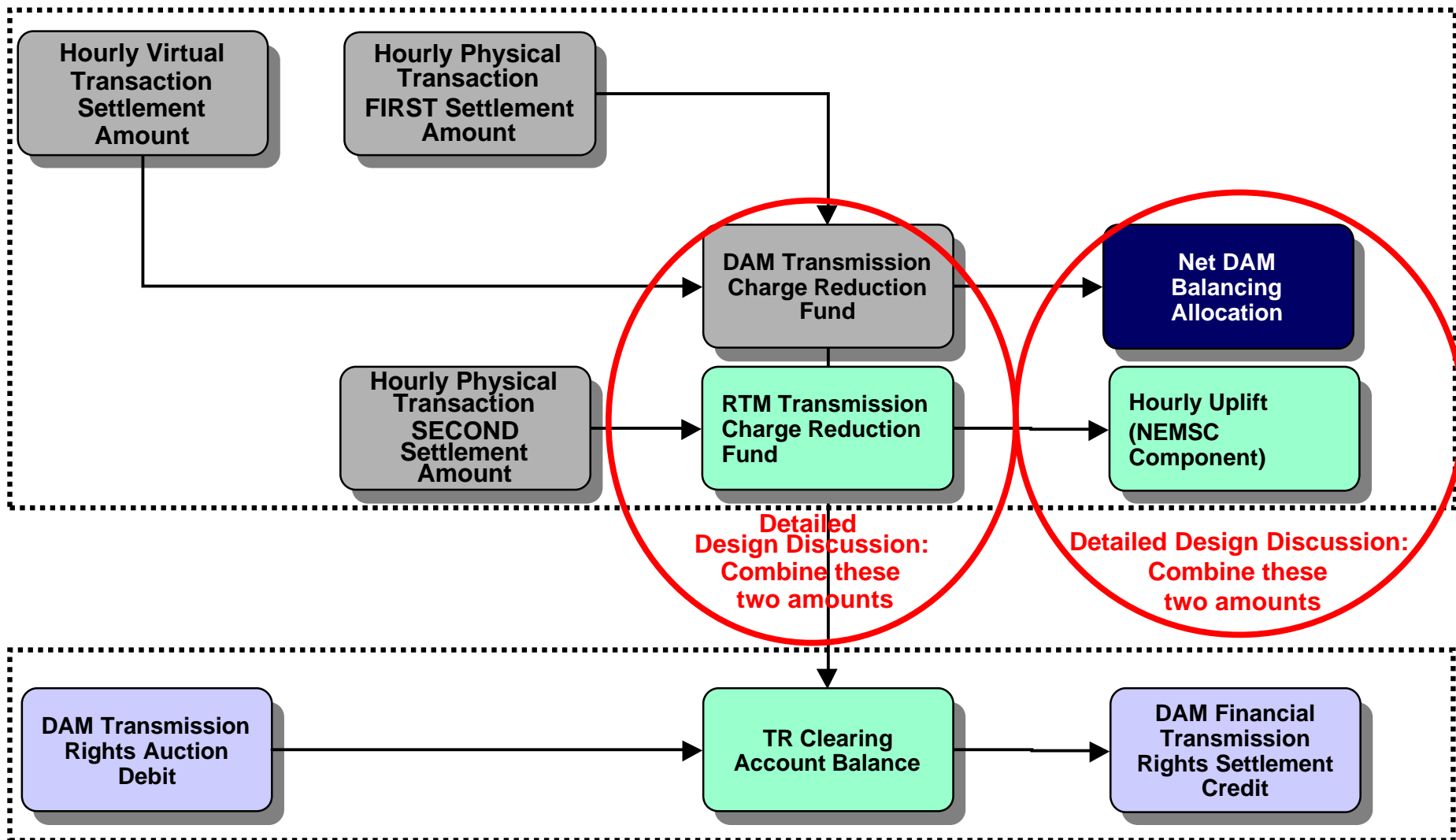
Time Resolution: HOURLY

Incorporates existing real-time cost allocation mechanisms?: YES
(includes existing NEMSC component of *hourly uplift*)

Allocation Base 1: All energy withdrawn from the IMO-administered markets

Uplifts Related to Market Balancing (“Net DAM Balancing Allocation):

Financial Neutrality:



Technical Aspects of Uplift Allocation

Uplifts Related to PASS 2 Import Commitments:

Time Resolution: HOURLY

Incorporates existing real-time cost allocation mechanisms?: YES
(includes existing CMSC component of *hourly uplift*)

Financial Neutrality:

Value of imports committed
in PASS 2 and NOT
scheduled in PASS 3

+

Value of the same imported
valued at the Hourly Ontario
Energy Price (HOEP)

=

**DAM Pass 2
Import Uplift**

Surplus Amounts:

Allocation Base 1: All energy withdrawn from the IMO-administered markets

Deficit Amounts:

Allocation Base 2: Loads not scheduled in the DAM + virtual transactions to sell energy

Thank You