

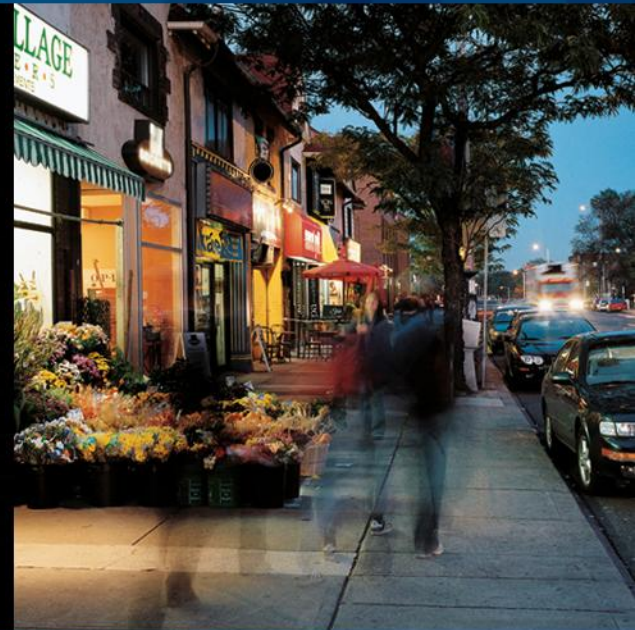
# Settlements Detailed Design Overview

Design Working Group Meeting  
June 10, 2010



1. Review combined cycle plant settlement
2. Review changes to the detailed design document
3. Market Rules true-ups for settlements

# Combined Cycle Plant Settlements

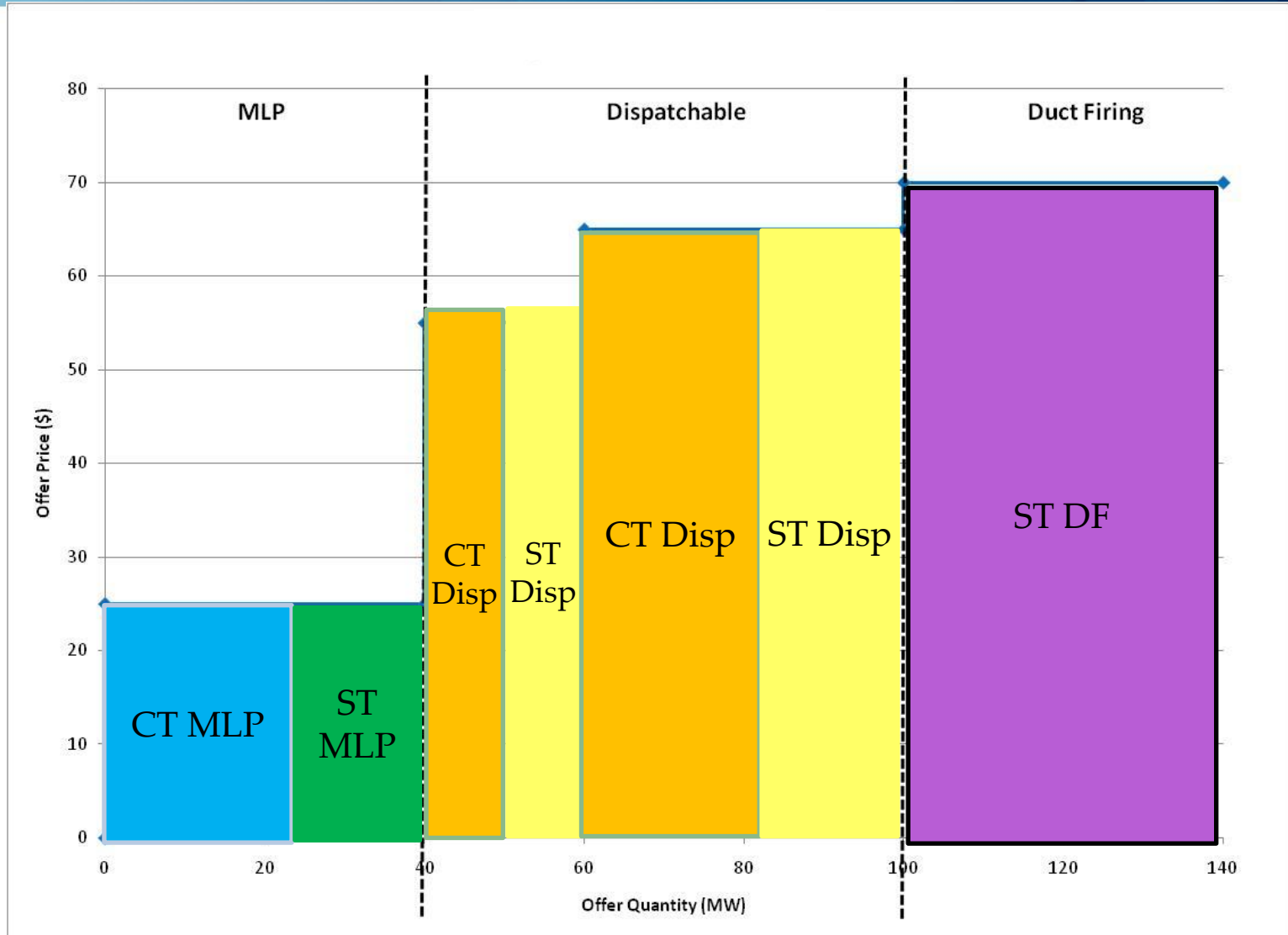


- On January 7 we met with members of the CCP Working Group to talk about Day-Ahead Production Cost Guarantee (DA-PCG) settlement for pseudo-unit resources
- The settlement for pseudo-unit resources on a physical unit basis was presented and agreed to with participants

- Pseudo-unit (PSU) resources are composed of a single combustion turbine (CT) and a portion of the shared steam turbine (ST)
- Day-ahead PSUs are offered using three-part offers which are inclusive of both CT and ST costs:
  - Speed-No-Load Cost
  - Start-up Cost
  - Incremental Energy Cost

# Combined Cycle Plants (CCP)

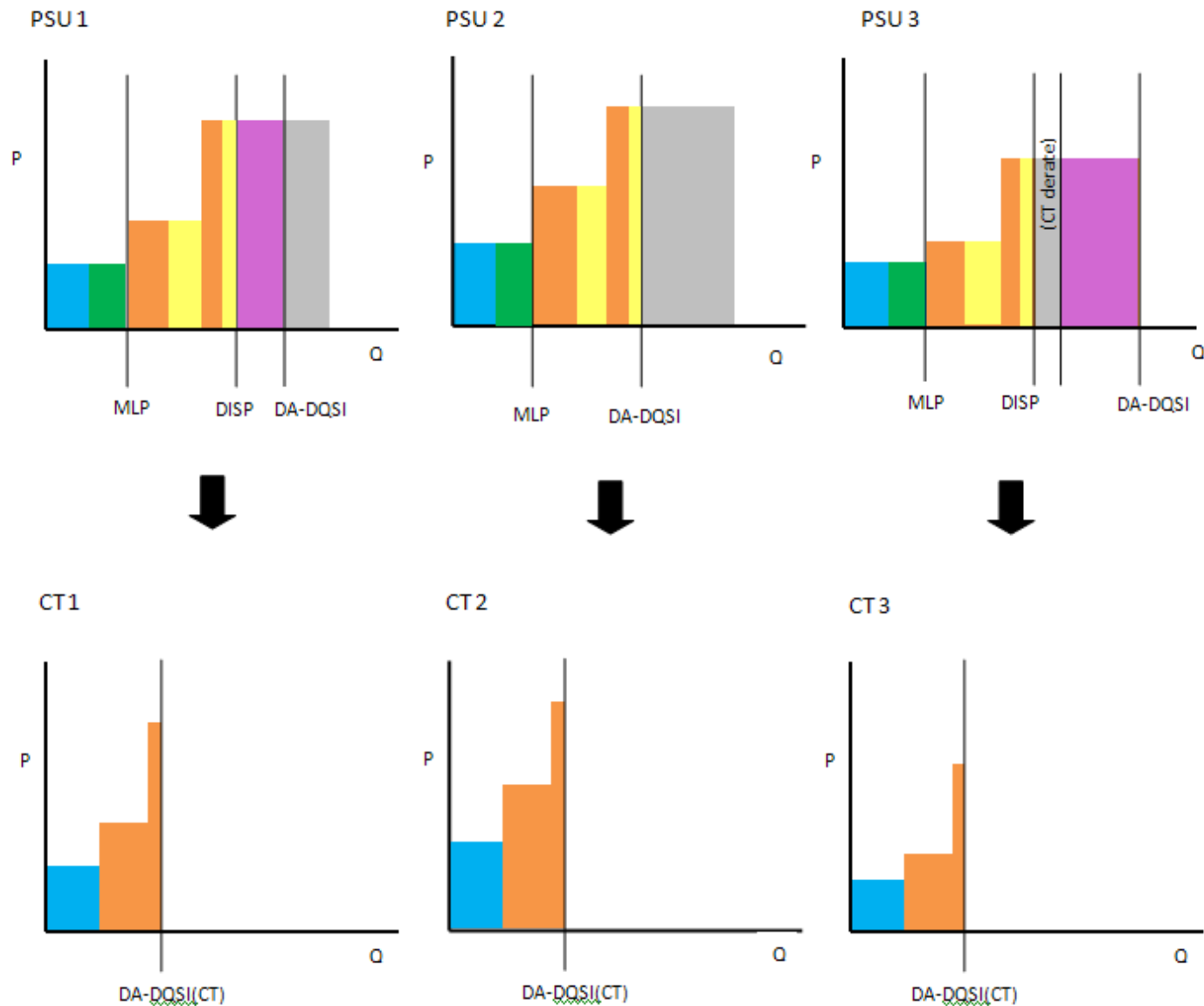
## Construct of a PSU Offer



- Decomposes day-ahead PSU offers into physical unit equivalents allowing the use of the DA-PCG equations that are used for all other resources

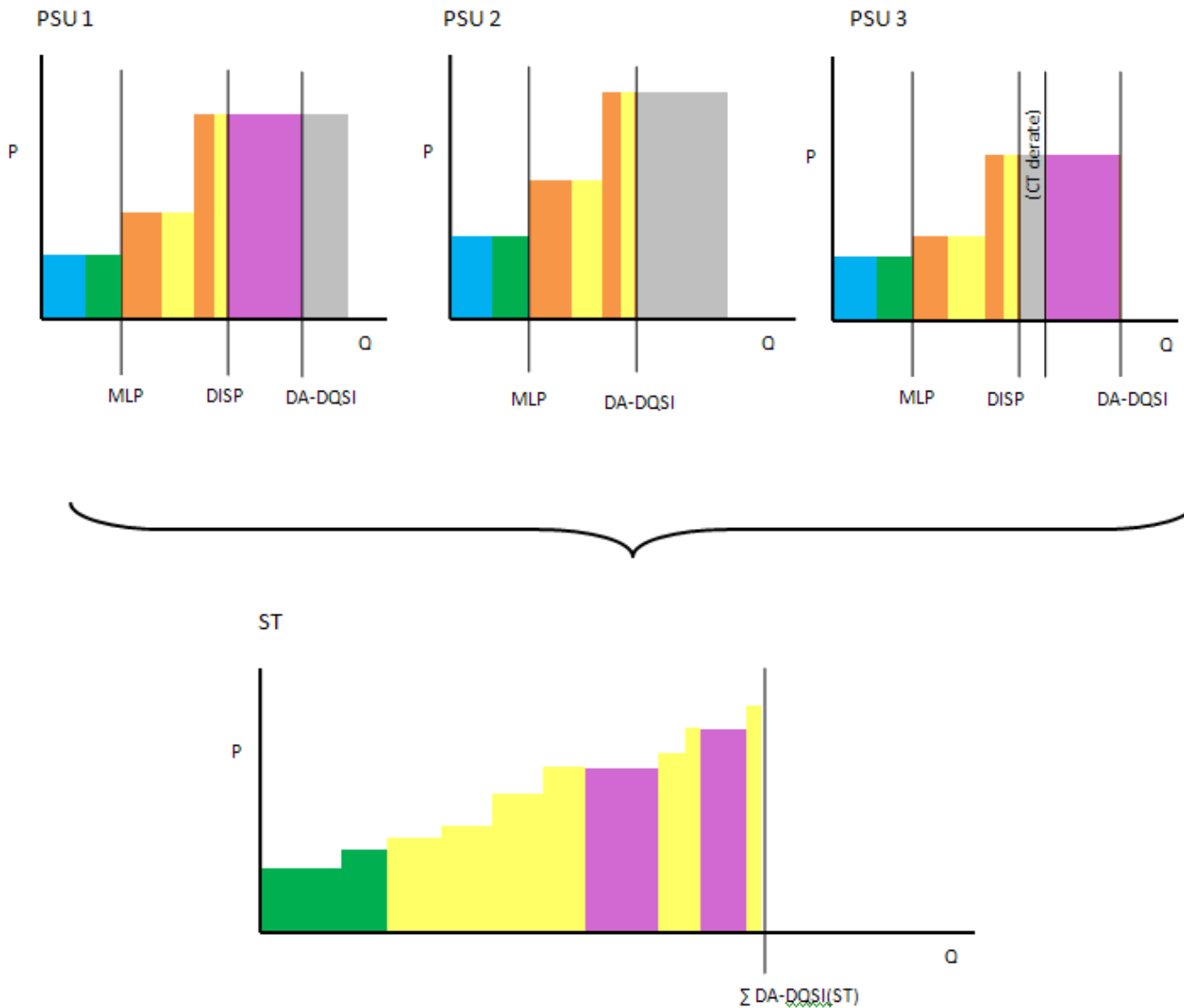
- The following slide provides an example of a CCP composed of three PSU resources, where all three obtain a day-ahead schedule and fulfill the PCG eligibility criteria
- As a result, the incremental offers of all three are allocated to the associated CT based on the proportions belonging to the PSU Sharing Region Data
  - PSU Sharing Region Data is calculated from Daily Generator Data and Registration Data

# Constructing the Day-Ahead CT Offers Example



- The following slide is for the same example where the incremental offers of all three PSUs are decomposed to comprise the ST incremental offer curve based on the proportions belonging to the PSU Sharing Region Data of each individual PSU

# Constructing the Day-Ahead ST Offer Example



# Settlements Detailed Design Document Updates



- The settlements detailed design document outlines the design as we know it today
  - The design identified in this document may change in response to integration issues, implementation challenges or other concerns

# Section 2

## Derived Interval Price Curve (DIPC)



- For the decomposition of the day-ahead PSU offers, the portions of the day-ahead PSU schedule in each operating region are determined
  - MLP Region Range Amount (MRRA)
  - Collapsed Region Range Amount (CRRRA)
  - Dispatchable Region Range Amount (DRRA)
  - Duct Firing Region Range Amount (DFRRA)

## Construct the DIPC for each CT (S:2.4.1)

- A derived interval price curve (DIPC) is constructed for each CT for every interval with a day-ahead schedule

## Construct the DIPC for the ST (S:2.4.2)

- A derived interval price curve (DIPC) is constructed for the ST:
  1. Constructing a ST Price Curve for each PSU (S: 2.4.2)
  2. Determining which PSUs are included in the DIPC (S: 2.4.3)
  3. Constructing the DIPC (S:2.4.4)

# Section 3

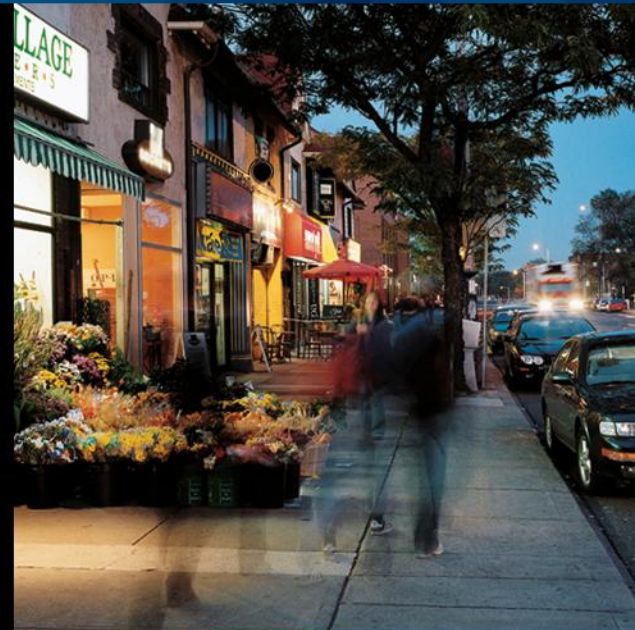
## Day-Ahead Production Cost Guarantee (DA-PCG)



- New section describing the MLP price cap for DA-PCG eligible generators scheduled in DACP:
  - Market participants who receive a day-ahead schedule in DACP and are DA-PCG eligible cannot increase their offer in real-time for the MLP as per Chapter 7, Section 3.3A.10 A of the market rules

# Section 4

## Day-Ahead Production Cost Guarantee (DA-PCG) for Pseudo-Units



- New section describing how the Day-Ahead Production Cost Guarantee is calculated for PSUs

- For each DACP start-event, the CT and ST eligibility are assessed independently
- For the CT to be eligible it must:
  - have its breaker closed by the start of the 1<sup>st</sup> interval of the 1<sup>st</sup> DACP scheduled hour ; and
  - not have withdrawn from the day-ahead commitment within the market participant's control for any hour in the DACP start event.

- For the ST to be eligible for a DA-PCG assessment, it must:
  - have at least one of its associated CT breakers closed by the start of the 1<sup>st</sup> interval of the 1<sup>st</sup> DACP scheduled hour ; and
  - not have withdrawn from the day-ahead commitment within the market participant's control for any hour in the DACP start event
- This is consistent with current production cost guarantee eligibility requirements.

- The DA-PCG for each CT and ST is calculated similarly to the DA-PCG for all other resources, with the following changes:
  - Component 1 and 3 Clawback for the ST will be based on the ST minimum loading point used as a result of the day-ahead scheduled configuration
  - Component 5 is calculated for the ST based on when the CT achieves minimum loading point

- The day-ahead ST schedule used for dispatch includes the ST Portions of all scheduled PSUs, but for calculation of the DA-PCG only the eligible ST Portions are included
  - The derived interval guaranteed quantity (DIGQ) for the ST is the sum of the ST Portion of the day-ahead PSU Schedules from all the PSUs where the associated CT is injecting energy in that interval

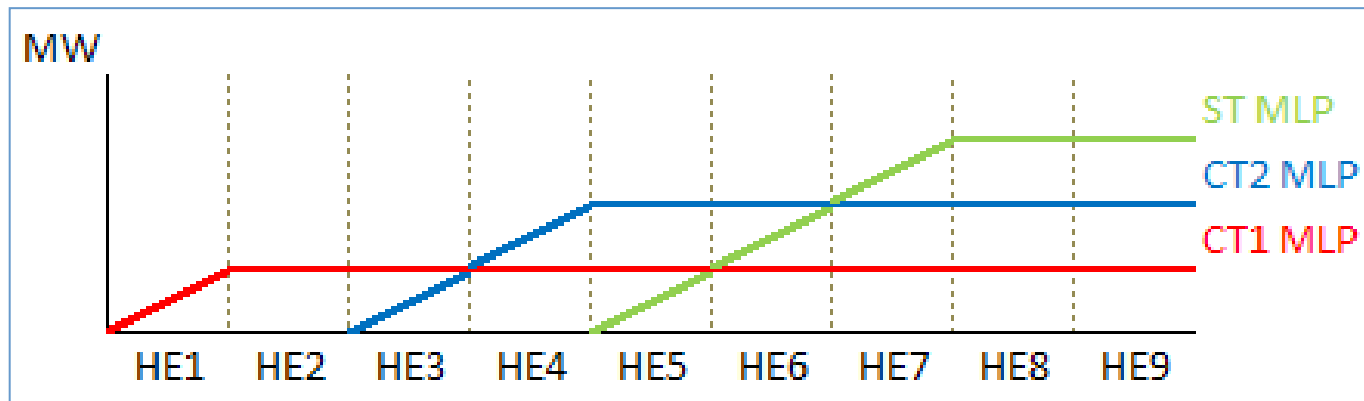
- The following correction to the design document will be made to take into account where duct firing portion does **not** exist

$DIGQ_{k,h}^{p,t}$	=	$\sum_{p=1}^N (\min(DA_{DQSI}_{k,h}^{p,t}, ORRA_{k,1}^p) \times ST_{Portion_{k,1}}^p$ $+ \max(\min(ORRA_{k,2}^p, DRRR_{k,h}^{p,t} - ORRA_{k,1}^p), 0) \times ST_{Portion_{k,2}}^p$ $+ \max(0, (DA_{DQSI}_{k,h}^{p,t} - CRRR_{k,h}^{p,t}) \times ST_{Portion_{k,3}}^p))$
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- By constructing registered facility derived interval price curves, the same DA-PCG calculations that are used for all resources may also be used for pseudo-units with the following four modifications:
  1. DA\_BE is replaced by the DIPC
  2. The ST DA\_DQSI is replaced by the DIGQ
  3. MLP for the CTs and the ST are from DGD data

4. The start-up and speed no load costs submitted as part of the PSU day-ahead offer are divided up between the CT and ST resources according to the ST Portion of the MLP Operating Region

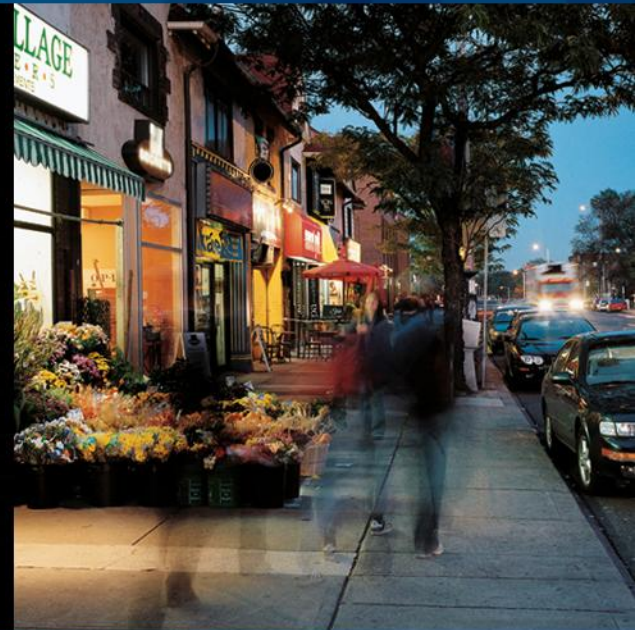
- The following example illustrates how the start-up cost (SUC) for PSU resources is calculated:
  - PSU1: receives a DA schedule from HE2 – HE9
  - PSU2: receives a DA schedule from HE4 – HE9



- CT1: start-up cost is 100% of CT1 portion of the PSU1 start-up cost
- CT2: start-up cost is 50% of CT2 portion of the PSU2 start-up cost
- ST: start-up cost is 100% of ST portion of PSU1 start-up cost plus 50% of ST portion of PSU2 start-up cost

# Section 6

## Day-Ahead Generator Withdrawal Charge (DA-GWC)



- Added new section describing how the Day-Ahead Generator Withdrawal Charge is calculated for PSUs
- The charge is calculated as it would for any other resource with the following exception:
  - The DIPC is used in place of the DA\_BE

# Section 7

## Intertie Offer Guarantee (IOG)



- Change references from notional DA-IOG and notional RT-IOG to calculated DA-IOG payment and calculated RT-IOG payment

# Section 10

## Day-Ahead Linked Wheel Failure Charge (DA-LWFC)



## DA-LWFC Charge Formula (10.2)

- A day-ahead linked wheel that fails in pre-dispatch is assessed for both:
  1. the DA-LWFC
  2. the failure using the real-time linked wheel failure charges (RT\_IFC and RT\_EFC)
- The participant is charged the lesser of the two

## DA-LWFC Charge Formula (10.2)

- Have one Charge Type for the DA-LWFC where the net settlement amount is equal to:
  - $\text{Min}[(\text{DA Price Spread} - \text{PD-1 Price Spread}) \times \text{MW failure}, (\text{Sum}(\text{RT\_IFC\_DALW}, \text{RT\_EFC\_DALW}))]$
- The formulas for RT\_IFC\_DALW and RT\_EFC\_DALW are the same as the RT-IFC and RT-EFC as in the current Market Rules with one change:
  - the MW failure is from DA to PD-1

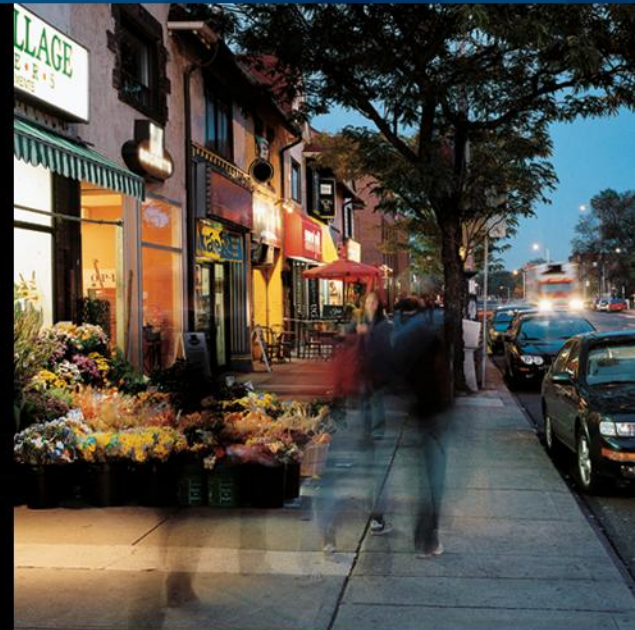
## DA-LWFC Charge Formula (10.2)

- The real-time failure charges (RT\_IFC and RT\_EFC) will continue to be settled as in the current Market Rules using the current charge types

- Removed Charge Type for the reversal of the minimum of DA-LWFC and  $\text{Sum}(\text{RT-IFC}, \text{RT-EFC})$

# Appendix E

## Reason Codes and Charge Types



- No change to the existing charge types
  - Real-Time Import Failure Charge
  - Real-Time Export Failure Charge
  - Day-Ahead Import Failure Charge
- Added treatment for the new intertie failure charges:
  - Day-Ahead Export Failure Charge
  - Day-Ahead Linked Wheel Failure Charge

# Negative CMSC due to Administered Pricing Events



- The reversal of negative CMSC due to administered pricing events (where certain criteria is met) is handled through the Notice of Disagreement process
- This settlement is proposed to be implemented into the daily settlement process

- This daily settlement charge type will be taken into account in the DA-PCG and DA-IOG Component 3 calculation
  - The condition to calculate where real-time CMSC (Charge Type 105) is non-zero value will now be where the sum of real-time CMSC (Charge Type 105) and Reversal of Negative CMSC (Charge Type XXXX) is a non-zero value

# Market Rules



- The following are Market Rule true-ups that are under consideration:
  - Reversal of inappropriate negative CMSC due to administered pricing events
  - IOG offset scenario for transactions that are real-time only:  
<http://www.ieso.ca/imoweb/pubs/consult/sdwg/sdwg-20091207-presentation.pdf>
  - Potential enabling rules for the calculation and use of DIPC, DIGQ, Start-up and SNL costs for PSU resources
- Rules process expected to start in October
- Stakeholder input through the Project Advisory Group