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Allocation of initial UFE to NHH

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COMPETITION • RELIABILITY • EFFICIENCY

PHYSICAL SETTLEMENT - RECONCILIATION

- The purpose of the reconciliation process is to
  - take into account the effects of energy being supplied to ICPs by different NSPs over time using the concept of balancing areas
  - take into account losses, balancing, adjustments and scaling
  - allocate electricity volumes in the electricity market to buyers and sellers
  - process information into a form for subsequent use by the clearing manager to invoice purchasers and generators

- NZEM mostly uses full global reconciliation which
  - calculates electricity conveyed within a network area ie (∑Injections to a network)
  - ensures that generation + adjustments = consumption + adjustments

- Differencing reconciliation is used in certain circumstances

PHYSICAL SETTLEMENT - RECONCILIATION

Differencing reconciliation methodology settlement equation

$$P_{\text{incumbent}} = GXP_{\text{metered}} + \sum EG_{\text{metered}} - \sum P_{\text{independent}} - \sum PL_{\text{independent}}$$

Where

EG_{metered} = volume of electricity from an embedded generator per trading period metered by an independent retailer

GXP_{metered} = volume of electricity per trading period metered for each grid connection point within a network area

$P_{\text{incumbent}}$ = volume of electricity per trading period invoiced to the incumbent retailer

$P_{\text{independent}}$ = volume of retailed electricity per trading period invoiced to the independent retailer, determined by meter readings from each retailer

$PL_{\text{independent}}$ = volume of losses of electricity per trading period calculated by the independent retailer and invoiced to the independent retailer

PHYSICAL SETTLEMENT - RECONCILIATION

Global reconciliation methodology settlement equation (simplified)

$$0 = GXP_{\text{metered}} + \sum IP_{\text{enter}} + \sum EG_{\text{metered}} - \sum P_{\text{retailer}} - \sum IP_{\text{exit}} +/- \sum UFE$$

Where

EG_{metered} = volume of electricity from an embedded generator per trading period invoiced to the retailer, determined by meter readings from each retailer, and loss adjusted by the reconciliation manager

GXP_{metered} = volume of electricity per trading period metered for each grid connection point within a network area

IP_{enter} = volume of electricity that enters a network area from another network

IP_{exit} = volume of electricity that exits a network area to another network

P_{retailer} = volume of retailed electricity per trading period invoiced to the retailer, determined by meter readings from each retailer, and loss adjusted and scaled by the reconciliation manager

UFE = Unaccounted For Electricity. The balance volume of electricity required to “0” each trading period at each GXP, that is pro-rated between purchasers from the electricity market

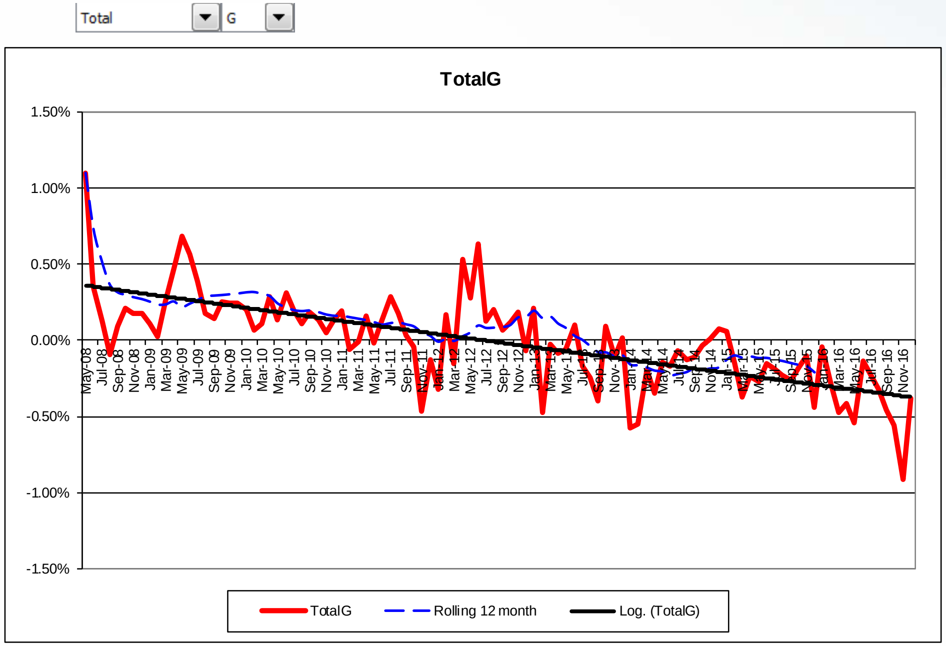
UNACCOUNTED FOR ELECTRICITY (UFE)

- UFE is calculated by trading period by balancing area and may be caused by one or more of the following
  - network loss factors
  - Inaccurate forward or historic estimates (NHH)
  - data handling errors
  - missing meter registers
  - unrecorded connections to networks
  - metering inaccuracies
  - incorrect allocations of ICP identifiers to balancing areas
  - missing information for interconnections

UNACCOUNTED FOR ELECTRICITY (UFE)

- UFE is applied to all NHH and HHR purchases within a balancing area, regardless if NHH or HHR is causing UFE
- What we observe is
  - large swings between R0, R1, R3 due to forward estimates, up to +/-6%/network, these wash out by R7 and R14
  - normal seasonal swings caused by variations in technical losses
  - standing UFE differences where either losses are calculated as too high or too low or there are other contributors
- Authority intends to publish UFE by GXP

UNACCOUNTED FOR ELECTRICITY (UFE)



- The quantity of electricity unallocated per trading period per balancing area after all submissions, adjustments and losses taken into account
- Can be +ve or -ve

- UFE stats
  - as at month 14 = -0.15%
  - as at 31 Dec 2016 = -0.45%
  - reduction since 1 May 2008 = approx -0.95%
  - average network UFE = -0.15%
  - highest network UFE = 2.30% (BA 4.64%)
  - lowest network UFE = -1.16% (BA -4.06%)
- UFE trending down means more electricity flow is being accounted for
  - at an average wholesale price of $65/MWh
    - is about $7M better allocation over the last 12 months
    - is about $1.5M better allocation over the last month referencing to 1 May 2008
  - at an average network price of $80/MWh is about $8.6M better allocation over the last 12 months
    - is about $1.8M better allocation over the last month referencing to 1 May 2008