

24 JUNE 2015

RECONCILIATION MANAGER

DISTRIBUTOR WORKSHOP

COMPETITION • RELIABILITY • EFFICIENCY



PHYSICAL SETTLEMENT - RECONCILIATION

- The purpose of reconciliation is to process information into a form for subsequent use by the clearing manager to invoice purchasers and generators
- NZEM mostly uses full global reconciliation
 - Reconciles by each NSP
 - no net metering
 - traders provide information
 - allocates UFE and scaling
 - loss adjusts information to grid connection points
 - calculates unaccounted for electricity (UFE)
 - all buyers and sellers to NZEM do so on same terms
 - monthly revisions for R1, R3, R7 and R14
- Differencing reconciliation is used in certain circumstances

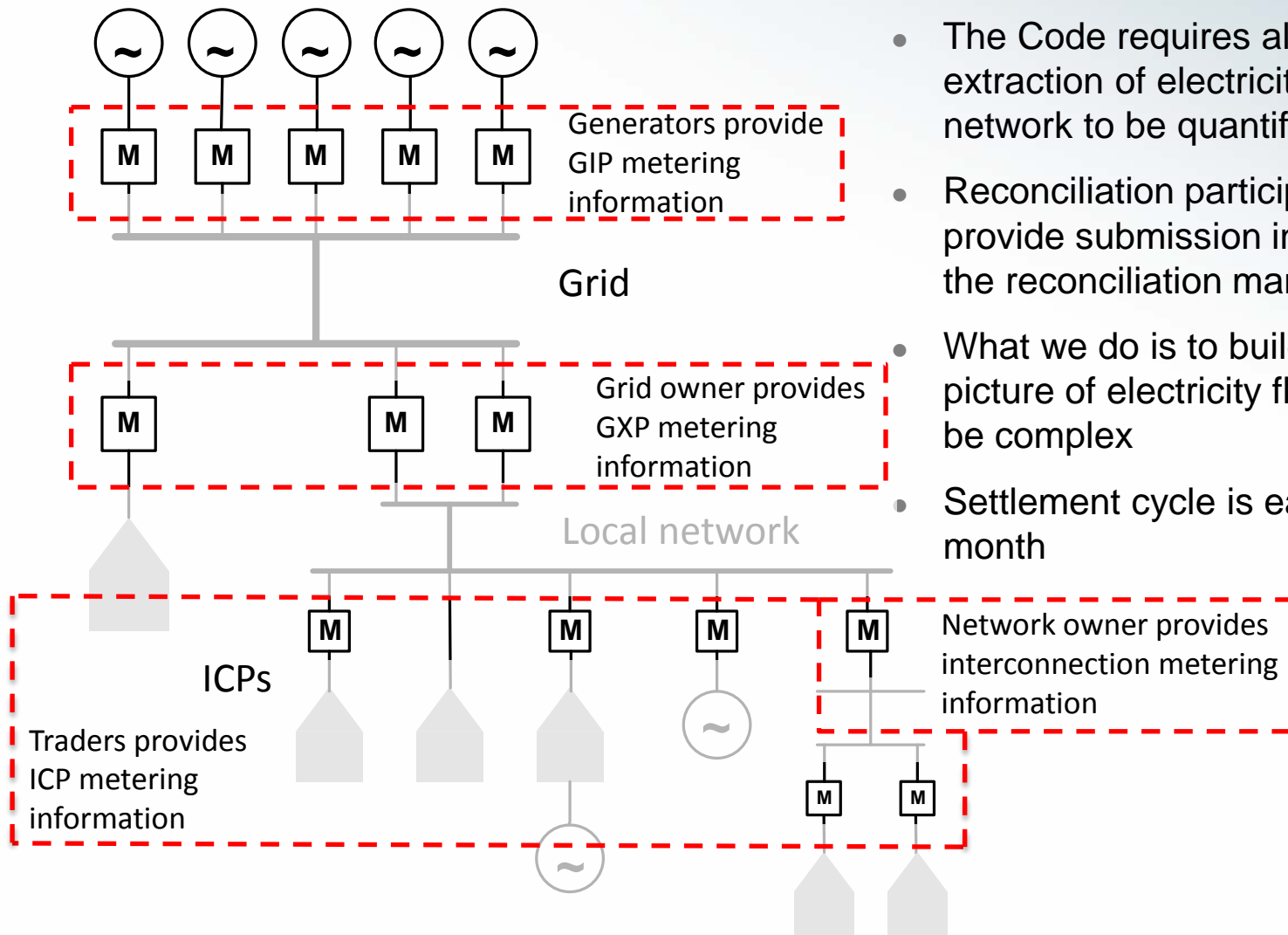
PHYSICAL SETTLEMENT - RECONCILIATION

- As of 1 May 2008, new reconciliation rules were introduced
- The intention of the rules was to treat all buyers and sellers the same by ensuring that unaccounted for electricity (UFE) is shared fairly
- Since that time, there has been little change to the reconciliation process, and reconciliation participants must
 - ensure that there is an MEP for points of connection they are a reconciliation participant for
 - obtain meter readings for:
 - HHR certified metering installations: 100% of meters must be read every month
 - NHH certified metering installations: 90% of meters must be read every four months per NSP, and 100% of meters must be read every 12 months per NSP
- Reconciliation participants must provide 'submission information' for each month to the reconciliation manager, aggregated to the following criteria
 - for half hour metering installations: the aggregated half hour volume per NSP, loss category code, flow direction, day, and trading period
 - for NHH metering installations: the aggregated reconciliation period (reconciliation period) volume per NSP, loss category code, and flow direction.

PHYSICAL SETTLEMENT - RECONCILIATION

- There are two distinct types of measurement recording used in the electricity market
 - non-half-hour (NHH) where volumes of electricity
 - are determined over a period of measurement greater than one trading period
 - are odometer type meter recording
 - over a period of time is calculated by subtracting a previous meter read from the current meter read
 - half-hour (HHR), where volumes of electricity
 - are determined for a period of less than one trading period
 - are recorded in absolute units and subtraction is not necessary to determine a volume
- The reconciliation process
 - synthesises NHH information into HHR information using “profiling”
 - Uses HHR information

PHYSICAL SETTLEMENT - RECONCILIATION



- The Code requires all injection and extraction of electricity from a network to be quantified
- Reconciliation participants must provide submission information to the reconciliation manager
- What we do is to build a physical picture of electricity flows. This can be complex
- Settlement cycle is each calendar month

PHYSICAL SETTLEMENT - RECONCILIATION

- Reconciliation model solves for 378 NSPs by trading period, profile and loss category code, and allows for
 - grid connected generation
 - any amount of embedded generation
 - grid connections to local networks
 - interconnections between local networks
 - interconnections to secondary networks
- Quantifies the total energy conveyed in a network (\sum Injections)
- The reconciliation process
 - synthesises NHH information into HHR information using “profiling”
 - Uses HHR information

GLOBAL RECONCILIATION

- Global reconciliation equation

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

Where

EGmetered = 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

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

IPenter = volume of electricity that enters a network area from another network

IPexit = volume of electricity that exits a network area to another network

Pretailer = 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

DIFFERENCING RECONCILIATION

- Differencing reconciliation 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

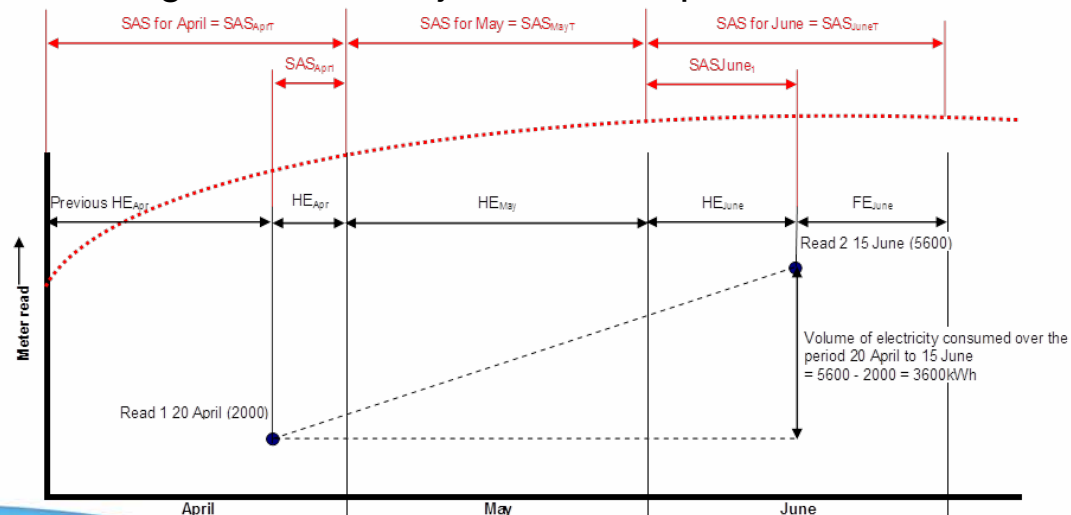
$PL_{\text{independent}}$ = volume of losses of electricity per trading period calculated by the independent retailer and invoiced to the independent retailer

INFORMATION PROVIDED TO THE RM

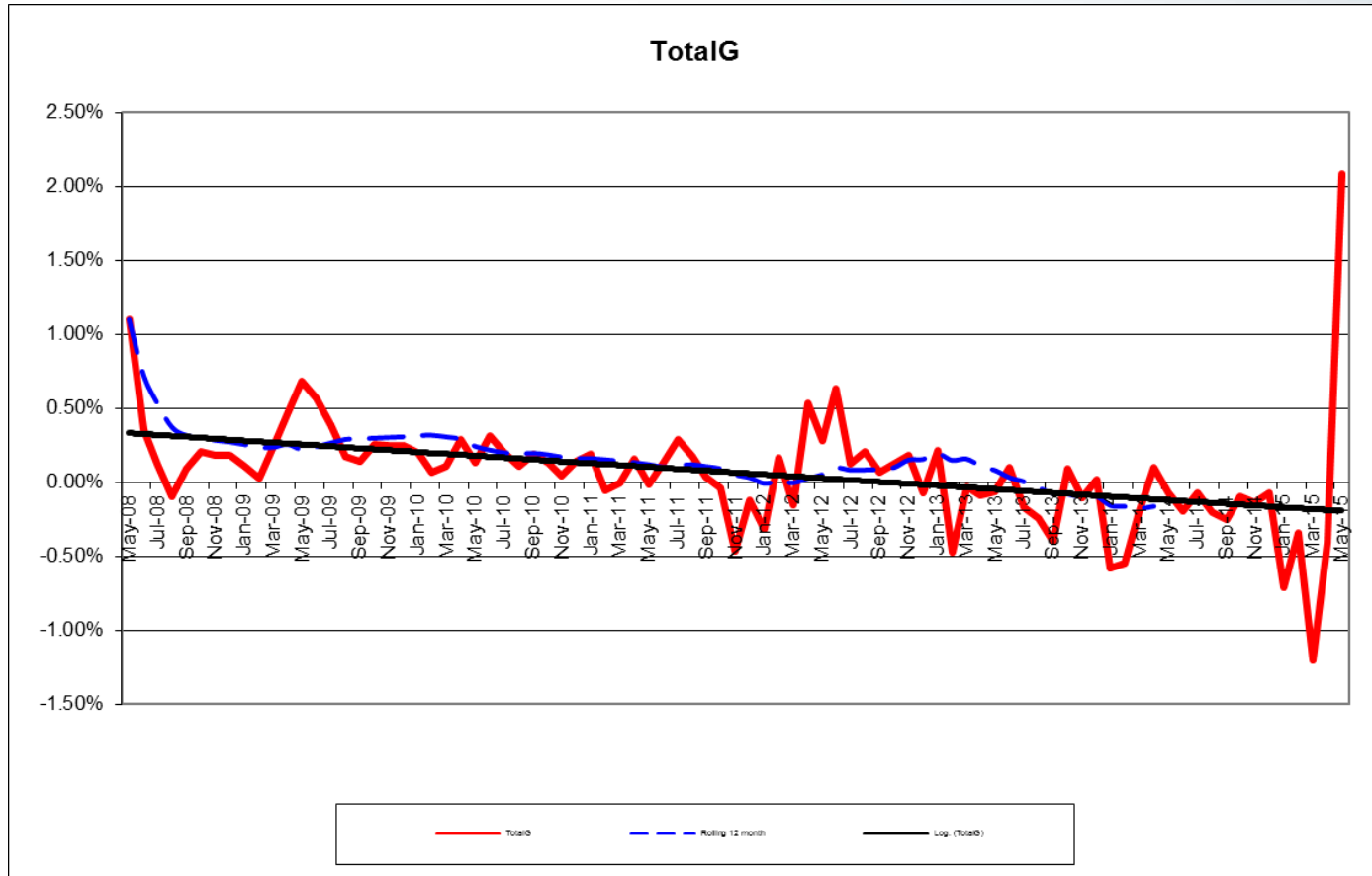
- Submission information
 - distributors must provide information to the registry
 - GXP for each ICP (used by traders in calculation of submission volume)
 - Loss category code for each ICP
 - Loss factors for each loss category code
 - distributors must provide information to the reconciliation manager
 - NSP information for interconnection point meters
 - balancing areas
 - The grid owner must provide information to the reconciliation manager
 - NSP information for all GXPs meters
 - The system operator must provide information to the reconciliation manager
 - The points of connection to the grid that were disconnected during each consumption period or supplied from an alternative point of connection (ie outage constraints).
 - traders must provide information to the reconciliation manager for the volume of electricity they have trade
 - For HHR submission this is aggregated half hour volumes
 - For NHH volumes this is profiled volumes

PROFILING

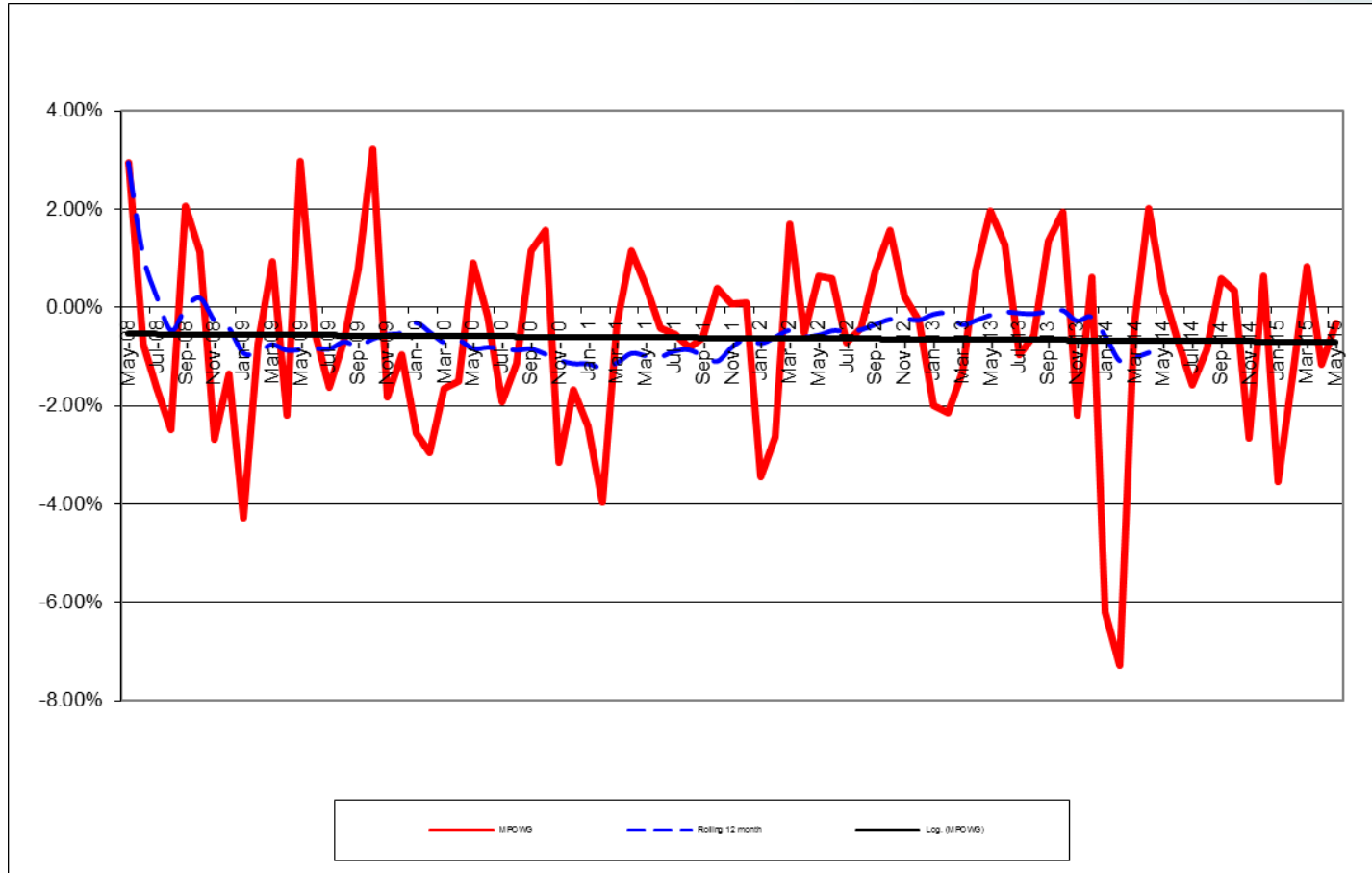
- It is necessary to synthesise NHH volumes into HHR
- Several steps to the process
 - Step 1 – traders must obtain meter readings (90% by GXP every 4 months and 100% every 12 months)
 - Step 2 - traders must use those meter readings to resolve NHH volumes into calendar months using “seasonal adjustment shapes



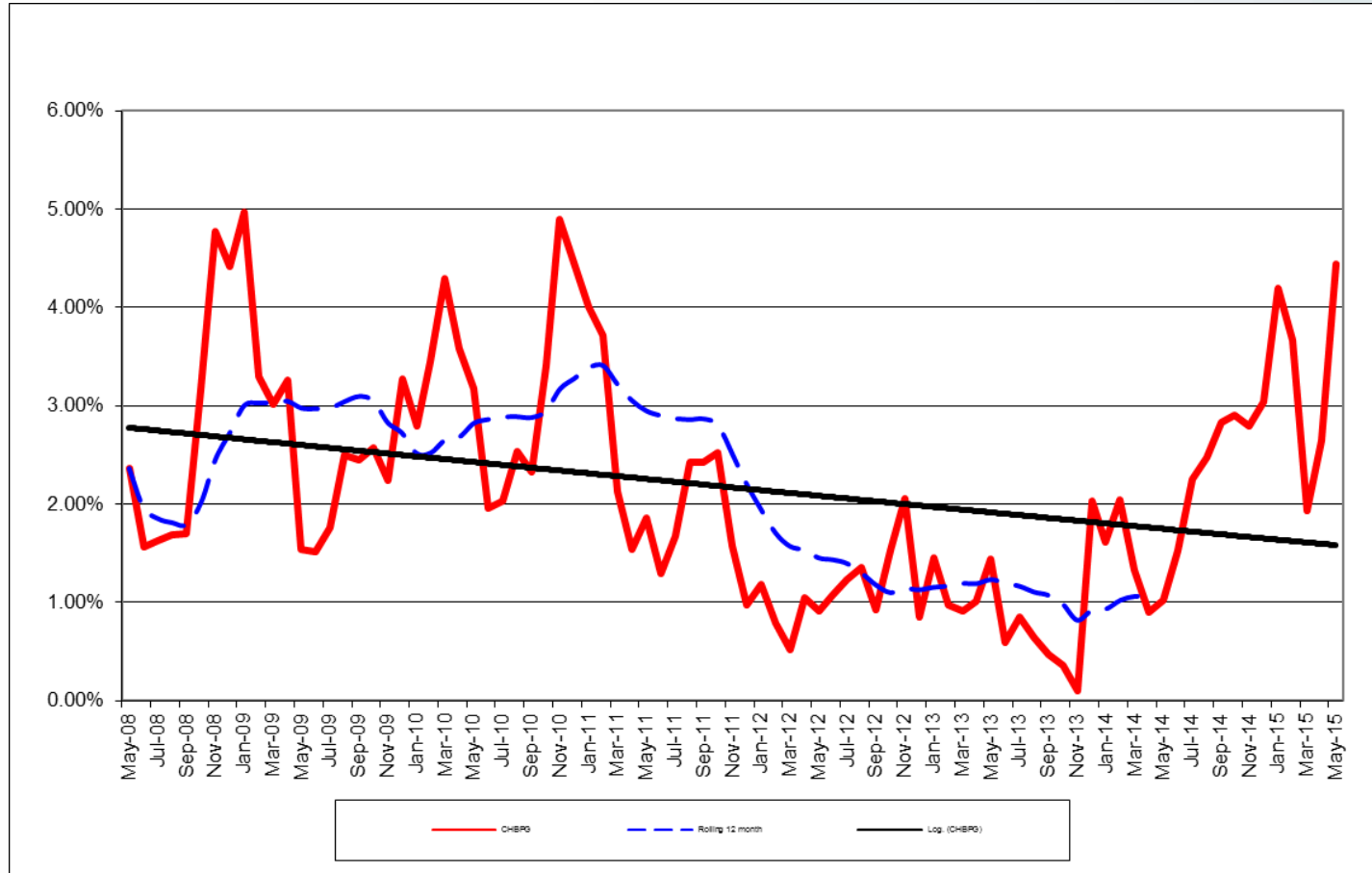
PHYSICAL SETTLEMENT – UFE FOR ALL “G”



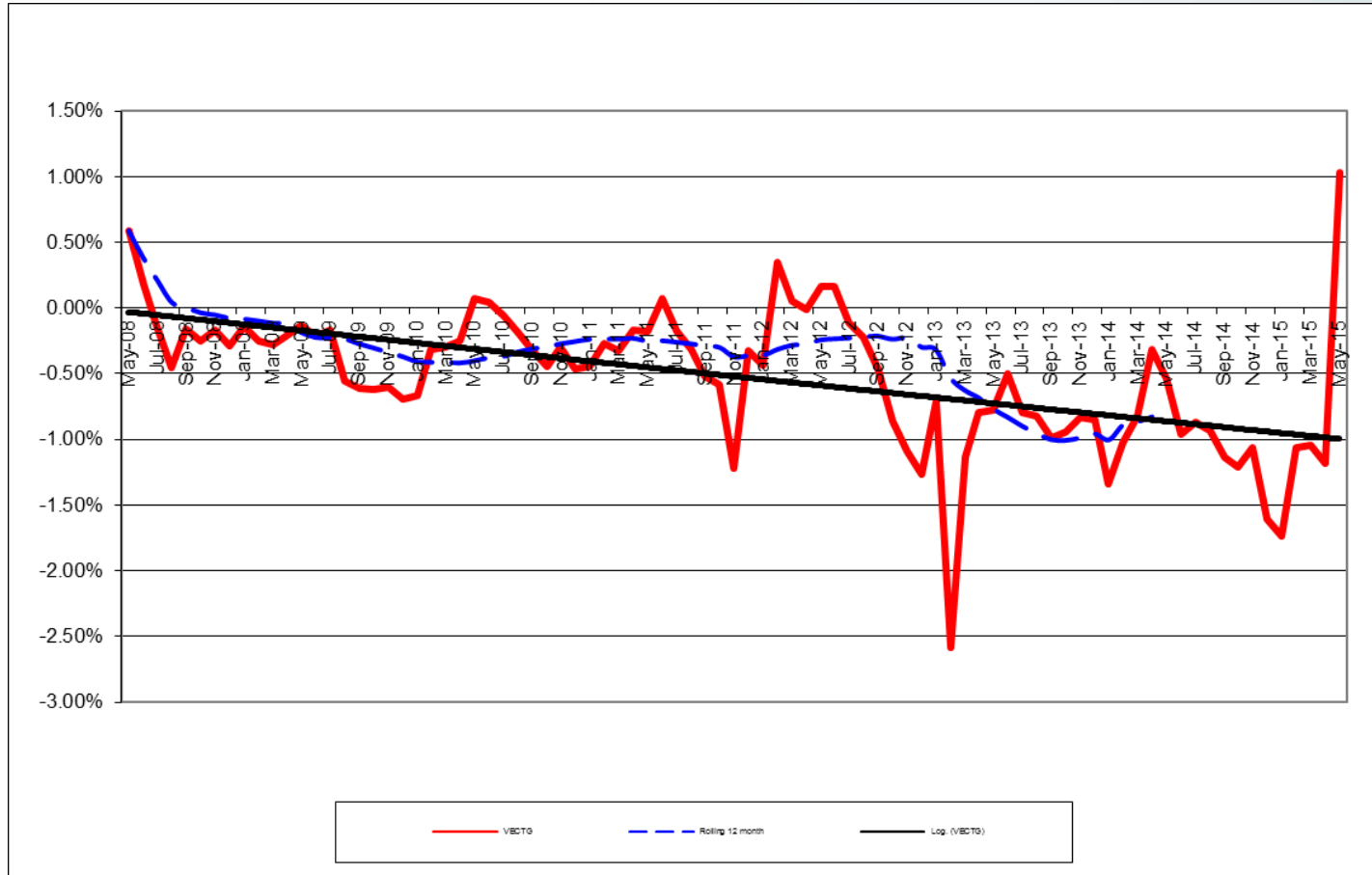
NETWORK UFE – UNUSUAL PATTERN



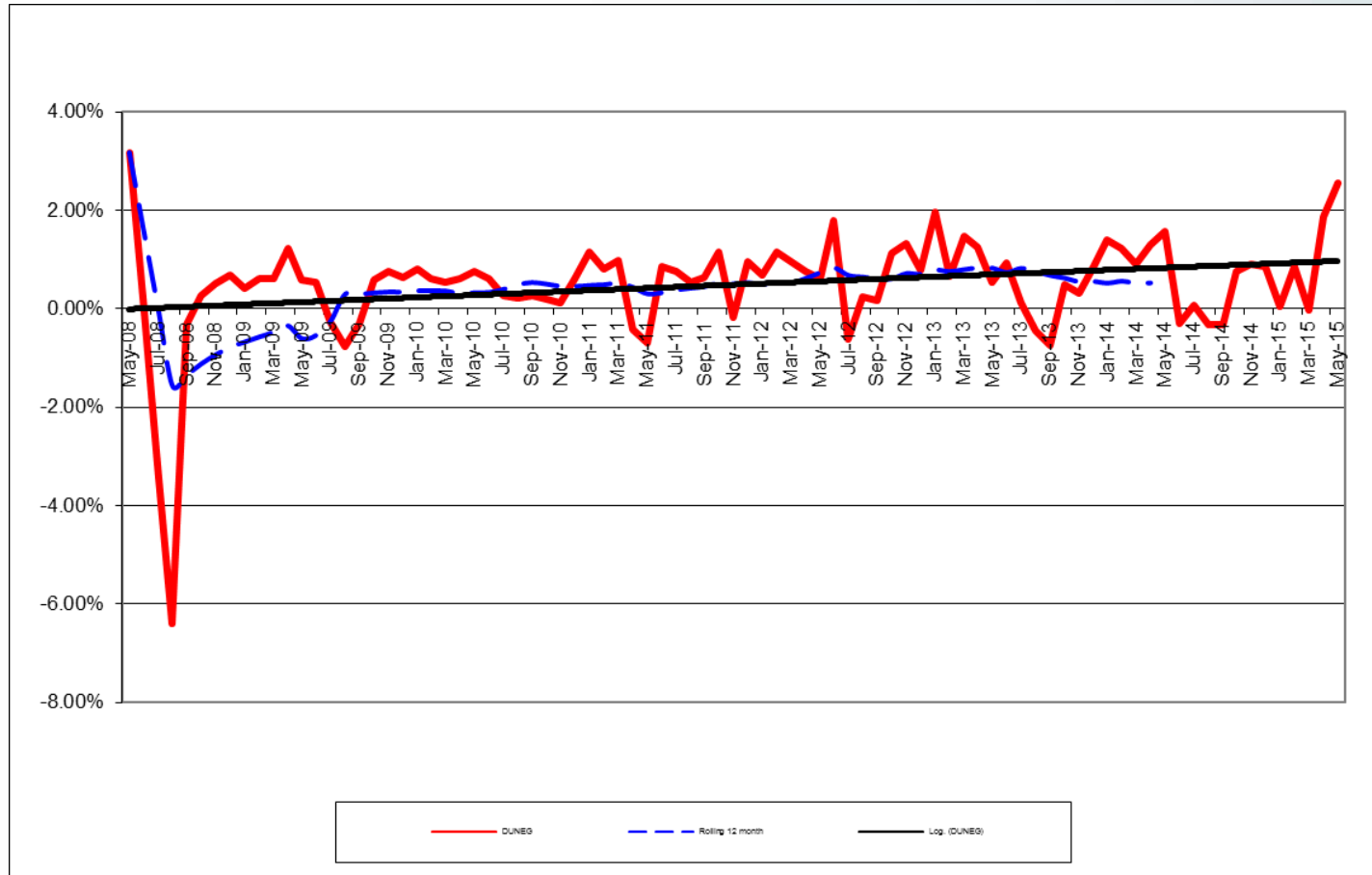
NETWORK UFE – UNUSUAL PATTERN



NETWORK UFE – GOOD PATTERN



NETWORK UFE – BAD PATTERN



PHYSICAL SETTLEMENT - RECONCILIATION

- Distributors may impact traders where there are changes to, or attempts to backdate information that has been used in the traders customer invoicing or market settlement processes
 - Creation of ICP identifiers
 - Incorrect address fields
 - Change of network participant identifier that ICP is connected to
 - Incorrectly assigning shared unmetered load
 - Network Supply Points (NSPs)
 - Price category codes
 - Loss factors
 - Direct billed status
 - Balancing areas

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