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Allocation of Unidentified Gas Expert

Methodology Review – Revised AUG Statement

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12 May 2017

Agenda

- Project overview
- Methodology overview
  - Overall UG estimation
  - EUC/Product split
  - Conversion to factors
  - Directly estimated UG components
  - Balancing Factor
  - Final UG factors
- Changes from previous draft
  - Smart Meter population percentages
  - Shrinkage issues
- Q&A

Project Overview

- AUG Expert appointed July 2016
- Pre-Nexus AUGE
  - RbD -> All UG initially allocated to SSP
  - Estimate total permanent UG
  - Split by LSP-SSP
- Post-Nexus AUG Expert
  - Calculate table of Weighting Factors to apportion UIG by EUC/Product Class
  - UIG is daily balancing figure

Project Overview

- Review of Project Nexus & UG Implications
- Request for data
- Methodology Development
  - AUG Statement
  - Consultation Period - AUGE.software@dnvgl.com

Key Dates	Description
01-Feb-17	First Draft AUG Statement published. Start of 42 day consultation period
08-Feb-17	Presentation of 1st draft AUG Statement
14-Mar-17	End of consultation period
13-Apr-17	Industry Meeting
12-May-17	Industry Meeting to discuss Revised AUG Statement
May UNCC	Vote on AUG Statement
30-Jun-17	Publication of final AUG Table

Updates from First Draft AUG Statement

- Smart Meter population

	Quarterly Installation Rate	Smat Meter Population 30/09/16	Smart Meter Population 30/09/17	Total Meter Population	Smart Meter Proportion
Dom	353,700	2,037,000	3,451,800	21,700,200	15.9%
Non-Dom	3,200	47,900	60,700	475,000	12.8%

Figures from Q3 2016 Smart Meter report, Department for Business, Energy & Industrial Strategy
https://www.gov.uk/government/collections/smart-meters-statistics
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/579197/2016_Q3_Smart_Meters_Report_Final.pdf

Updates from First Draft AUG Statement

- Shrinkage Error
  - This is not Unidentified Gas but current process results in it ending up included in the UG total
  - Dealt with in UG as an interim measure only
  - Current best estimate is that Shrinkage is under-estimated by ≈20%
    - Energy UK Gas Retail Group Study into the effect of shrinkage on domestic customers
  - Quantified using Shrinkage statements and split by throughput
  - Results in UG in **all** EUC/Product Classes, including Product 1 and EUC 09B

Updates from First Draft AUG Statement

- CSEP Shrinkage
  - No CSEP element in current Shrinkage process
  - Dealt with here as an interim measure
  - Current best estimate is that CSEP Shrinkage is ≈3.5% of total Shrinkage
  - Quantified using Shrinkage statements and split by CSEP throughput
  - Results in further UG in **all** EUC/Product Classes, including Product 1 and EUC 09B

Updates from First Draft AUG Statement

- *If* Shrinkage bias exists, the Mod 432 method results in it being part of UIG
- If it is there, it is better to deal with it rather than ignore it
  - Split Shrinkage bias element by throughput
  - Potential to modify process
  - Split out Shrinkage "UG" and actual UG to ensure appropriate parties are billed

- GRG document delivered in October 2015
- GDNs response in November 2016
- No official conclusion from Shrinkage Forum

- We will act on any such official communication

Updates from First Draft AUG Statement

- UG Method vs input data
  - Method remains the same whatever the Shrinkage Error inputs are
    - Shrinkage Error 20%, 0%, or something in between
    - CSEP Shrinkage 3.5%, 0%, or something in between
  - Method has been finalised
  - Input data has not

- One more iteration of the Factor table
- Input required by 23rd June to feed into final UG Factors

Other Issues Raised in Consultation

- Meter read separation in Consumption Method
  - Effect is likely to be small
  - Awaiting data for analysis

- Table of factors
  - Set of tables showing progressive impact of Shrinkage elements provided
  - This version as based on 20% Smart Meter penetration rate
  - New set has been calculated based on latest figures

Latest UG Factors

UG Factors 1

No Shrinkage Error, No CSEP Shrinkage

	Product 1	Product 2	Product 3	Product 4
01B	0.000	5.098	5.102	11.240
02B	0.000	5.193	5.185	11.800
03B	0.000	5.422	5.418	11.674
04B	0.000	5.601	5.610	5.455
05B	0.000	5.546	5.570	5.936
06B	0.000	5.072	5.108	5.424
07B	0.000	3.995	4.057	4.526
08B	0.000	2.130	2.157	1.823
09B	0.000	1.170	1.170	1.170

UG Factors 2

Shrinkage Error but no CSEP Shrinkage

	Product 1	Product 2	Product 3	Product 4
01B	1.152	5.458	5.462	10.594
02B	1.152	5.553	5.546	11.129
03B	1.152	5.758	5.754	11.003
04B	1.152	5.917	5.926	5.807
05B	1.152	5.874	5.898	6.180
06B	1.152	5.473	5.509	5.763
07B	1.152	4.057	4.596	4.526
08B	1.152	2.971	2.998	2.740
09B	1.152	1.152	1.152	1.152

These UG Factors have been superseded.

See https://www.gasgovernance.co.uk/augenex/1718

"30 June 2017 Final Factor Table Letter" for latest UG factors

UG Factors 3

Shrinkage Error and CSEP Shrinkage

	Product 1	Product 2	Product 3	Product 4
01B	1.170	5.599	5.603	10.548
02B	1.170	5.521	5.511	10.902
03B	1.170	5.652	5.647	10.782
04B	1.170	5.810	5.821	5.777
05B	1.170	5.810	5.841	6.163
06B	1.170	5.469	5.515	5.763
07B	1.170	4.603	4.652	4.544
08B	1.170	3.028	3.060	2.770
09B	1.170	1.170	1.170	1.170

Thank you

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Methodology Overview

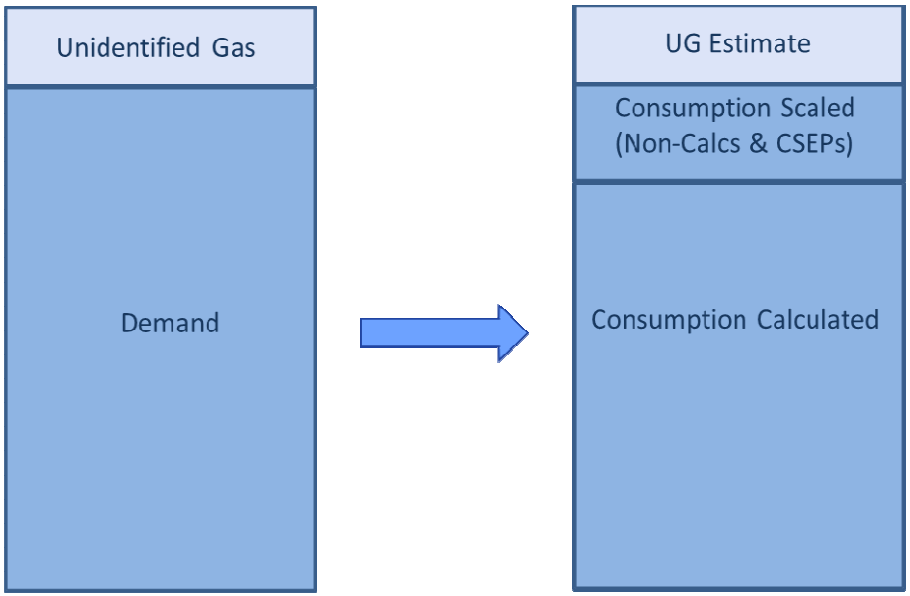
- Detailed slides describing UG method

Methodology Overview

- Evolving methodology
  - Year 1:
    - Only pre-Nexus data available
    - Similar methodology to previous years
    - Estimate Total UG & Split by EUC/Product class
  - Subsequent years:
    - Post-Nexus data available

Total UG Estimation

- Need estimate of Total UG to calculate factors (Consumption Method)
- Estimate Total UG = LDZ Input – Sum of Consumption for all MPRs
  - LDZ Input Metered
  - Consumption is estimated based on meter reads, AQ etc

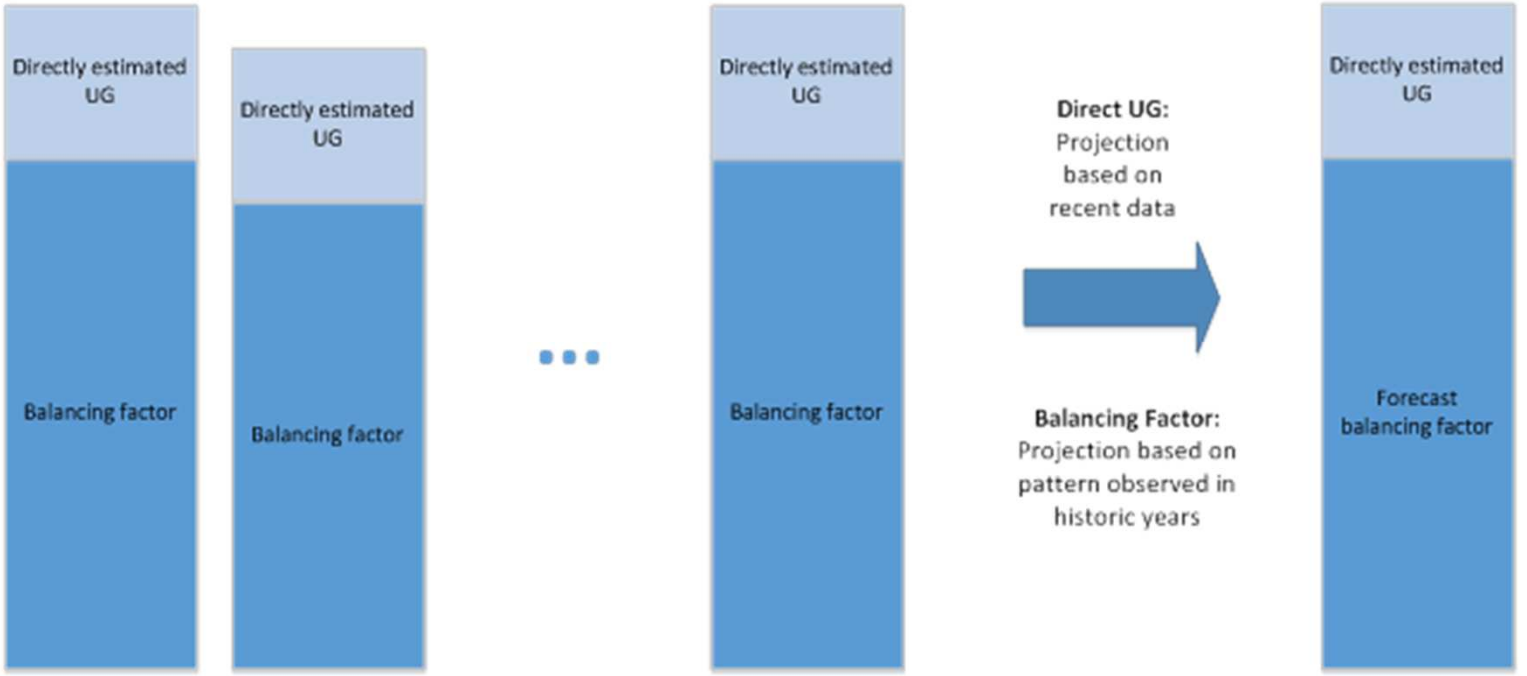


Consumption Method Changes

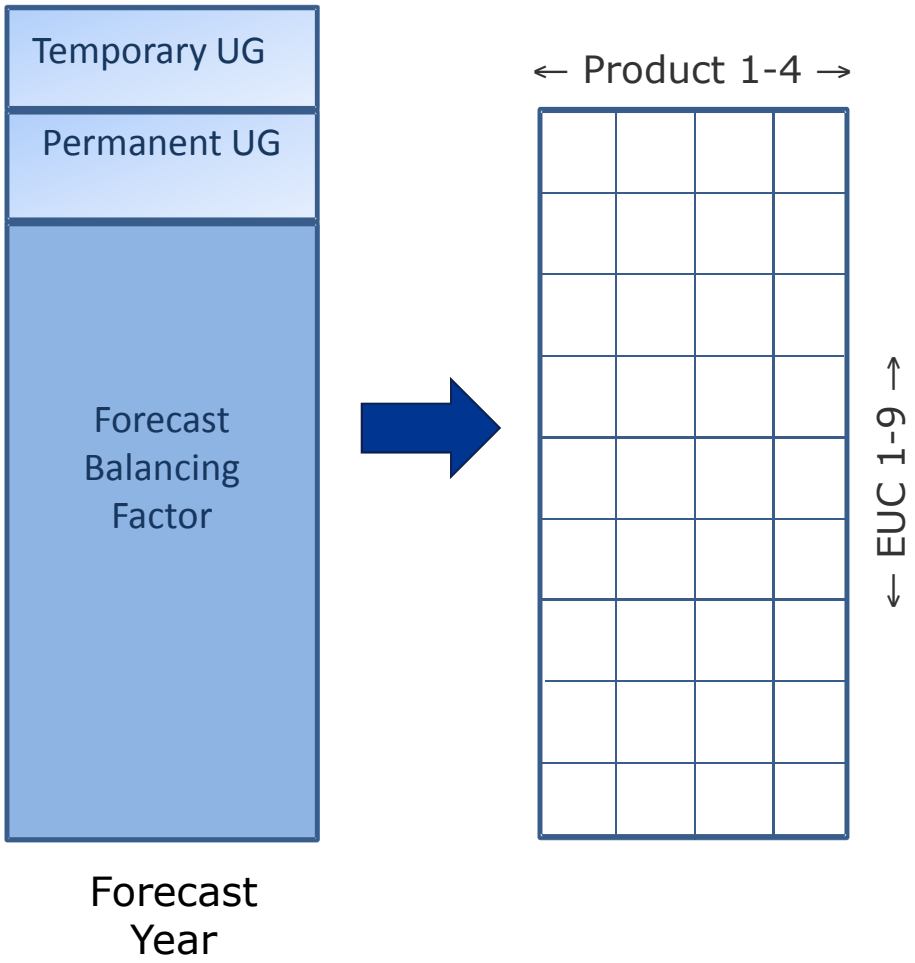
- Align to Gas Year
- Prime/Sub Disaggregation
- CSEP consumption
  - Snapshot dates
  - NExA table updates
- Longer Data History (all Pre-Nexus)
- Improvement in Meter Asset Information

Forecast UG

- Balancing Factor
  - BF = Total UG – Directly estimated UG
  - Projected forward using data up to 2014/15
- Directly estimated UG
  - Most recent data available



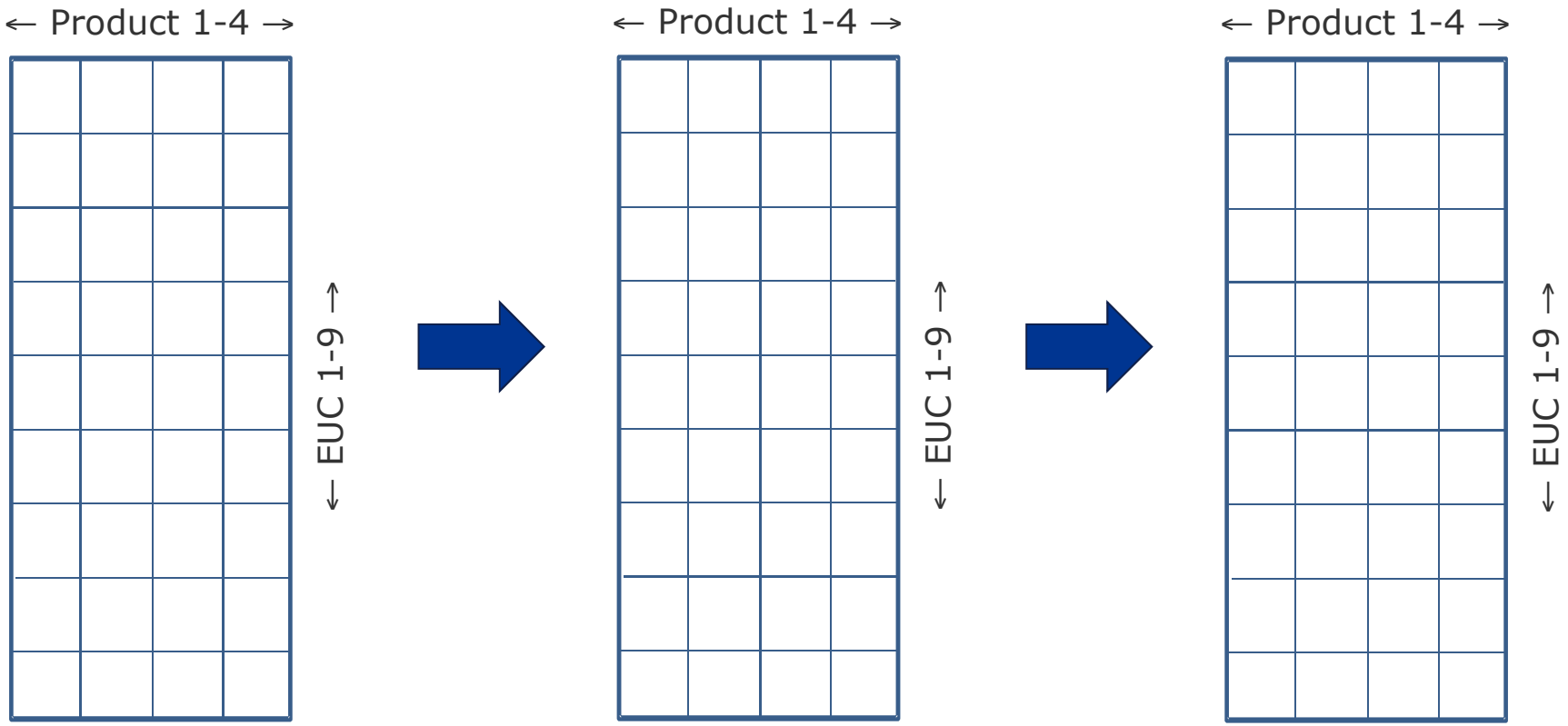
Forecast UG Components (GWh)



- Split of directly calculated UG categories is part of this calculation
- Balancing Factor is nearly all undetected theft
  - Split by throughput, amended for relative difficulty of stealing from different meter types and metering regimes
    - Smart meter, AMR, traditional meter
    - Daily meter readings, periodic meter readings
  - Input from experts
    - DNV GL metering team
    - TRAS/Industry

Energy → Factors

Energy (GWh) … divide by … **Throughput (AQ)** … gives … **Factors**



Population/Throughput Estimate

- Based on pre-Nexus data (existing market sectors)

- For each EUC
  - **Product 1 = DMM**
    - DMM and EUC 09B treated as the same thing for this calculation
  - **Product 2 = DMV + DME + (Smart Meters + AMR) * Takeup Rate**
    - Existing DM element calculated as any DM below 09B AQ threshold
    - Takeup Rate defined through consultation with Xoserve
  - **Product 3 = (Smart Meters + AMR) * Takeup Rate**
    - Takeup Rate defined through consultation with Xoserve
  - **Product 4 = Total EUC Population – Product 1 – Product 2 – Product 3**
    - Product 4 will contain the majority of the population at this stage for most EUCs

- Data available through asset information provided for Consumption Method

Population/Throughput Estimate

- Modifiers to supplied asset data required

- Smart Meter roll-out completion percentage
  - At start of forecast year (October 2017)

- Regulations state that all sites in EUC 04B and above must have an advanced meter

- Assumptions used are:

Parameter	**Value**
Smart Meter Installation Programme Completion (start of forecast year): EUC 01B	16%
Smart Meter Installation Programme Completion (start of forecast year): EUCs 02B-03B	13%
Product 2 Take Up (for Smart Meter and AMR Sites)	10%
Product 3 Take Up (for Smart Meter and AMR Sites)	15%

Population Estimate by EUC and Product

1st October 2017

Total Polulation

	01B	02B	03B	04B	05B	06B	07B	08B	09B
Product 1	0	0	0	0	0	0	0	0	293
Product 2	345,376	2,559	626	1,948	533	391	249	251	0
Product 3	518,009	3,805	908	2,838	683	221	76	28	0
Product 4	20,716,196	185,813	44,155	14,192	3,416	1,107	382	140	0

Percentage Population Split

	01B	02B	03B	04B	05B	06B	07B	08B	09B
Product 1	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.001%
Product 2	1.581%	0.012%	0.003%	0.009%	0.002%	0.002%	0.001%	0.001%	0.000%
Product 3	2.371%	0.017%	0.004%	0.013%	0.003%	0.001%	0.000%	0.000%	0.000%
Product 4	94.836%	0.851%	0.202%	0.065%	0.016%	0.005%	0.002%	0.001%	0.000%

Throughput Estimate by EUC and Product

1st October 2017

Aggregate AQ (GWh)

	01B	02B	03B	04B	05B	06B	07B	08B	09B
Product 1	0	0	0	0	0	0	0	0	41,019
Product 2	4,689	349	282	2,325	1,896	3,886	5,270	10,791	0
Product 3	7,033	520	409	3,377	2,375	1,982	1,546	1,106	0
Product 4	281,196	25,399	19,894	16,887	11,874	9,912	7,732	5,532	0

Percentage AQ Split

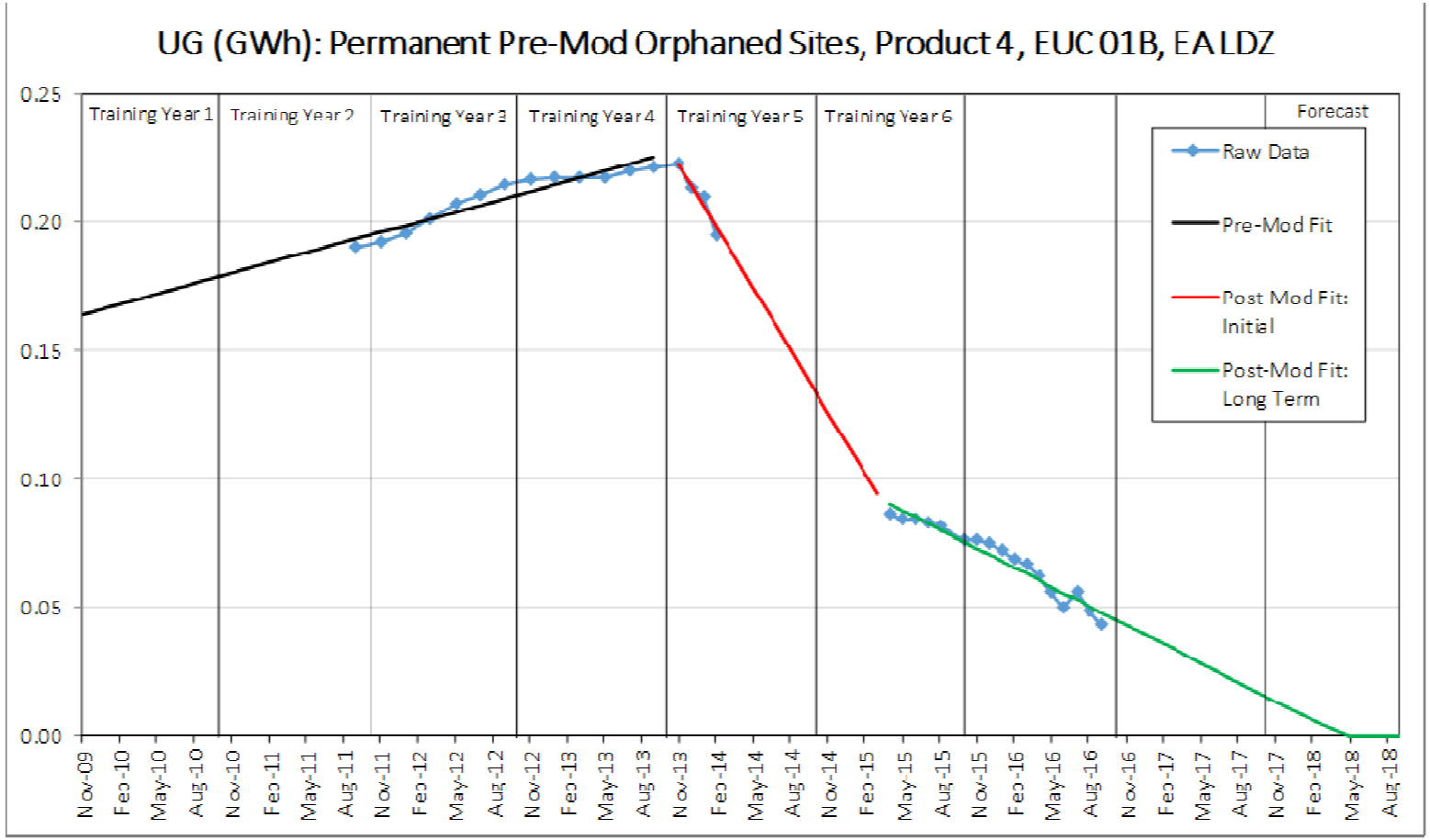
	01B	02B	03B	04B	05B	06B	07B	08B	09B
Product 1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8.78%
Product 2	1.00%	0.07%	0.06%	0.50%	0.41%	0.83%	1.13%	2.31%	0.00%
Product 3	1.51%	0.11%	0.09%	0.72%	0.51%	0.42%	0.33%	0.24%	0.00%
Product 4	60.18%	5.44%	4.26%	3.61%	2.54%	2.12%	1.65%	1.18%	0.00%

Shipperless/Unregistered Sites

- Snapshots Sep 2011 – Sep 2016
- EUC from AQ (supplied in snapshots)
- Split as appropriate for
  - Pre/post Mod 410A (using Effective Date)
  - Pre/post Mod 424 (using Isolation Date)
  - Pre/post Mod 425 (using Isolation Date)
- Split between Temporary and Permanent using existing rules
- Split between Products for each EUC
  - Use rules previously defined
- Trend over time → extrapolate to forecast year

Shipperless/Unregistered Sites – Example Trend

- Each trend needs to be constructed using a piecewise approach
- Effects of relevant Mod over time



Shipperless/Unregistered Sites

- All relevant Mods well established
  - Latest is Mod 425, effective from 01/04/2014
- Effects can be tracked with the set of snapshots available
  - Construct piecewise trends
- Split each UG category into
  - Pre- and post-Mod sites
  - Permanent/Temporary
  - LDZ
  - EUC
  - Product
- 1872 trends for each main Shipperless/Unregistered UG category

iGT CSEPs

- Snapshots Jan 2015 – Jun 2016 (Unknown Projects)
- Unregistered sites on known CSEPs
- Registered sites on known CSEPs

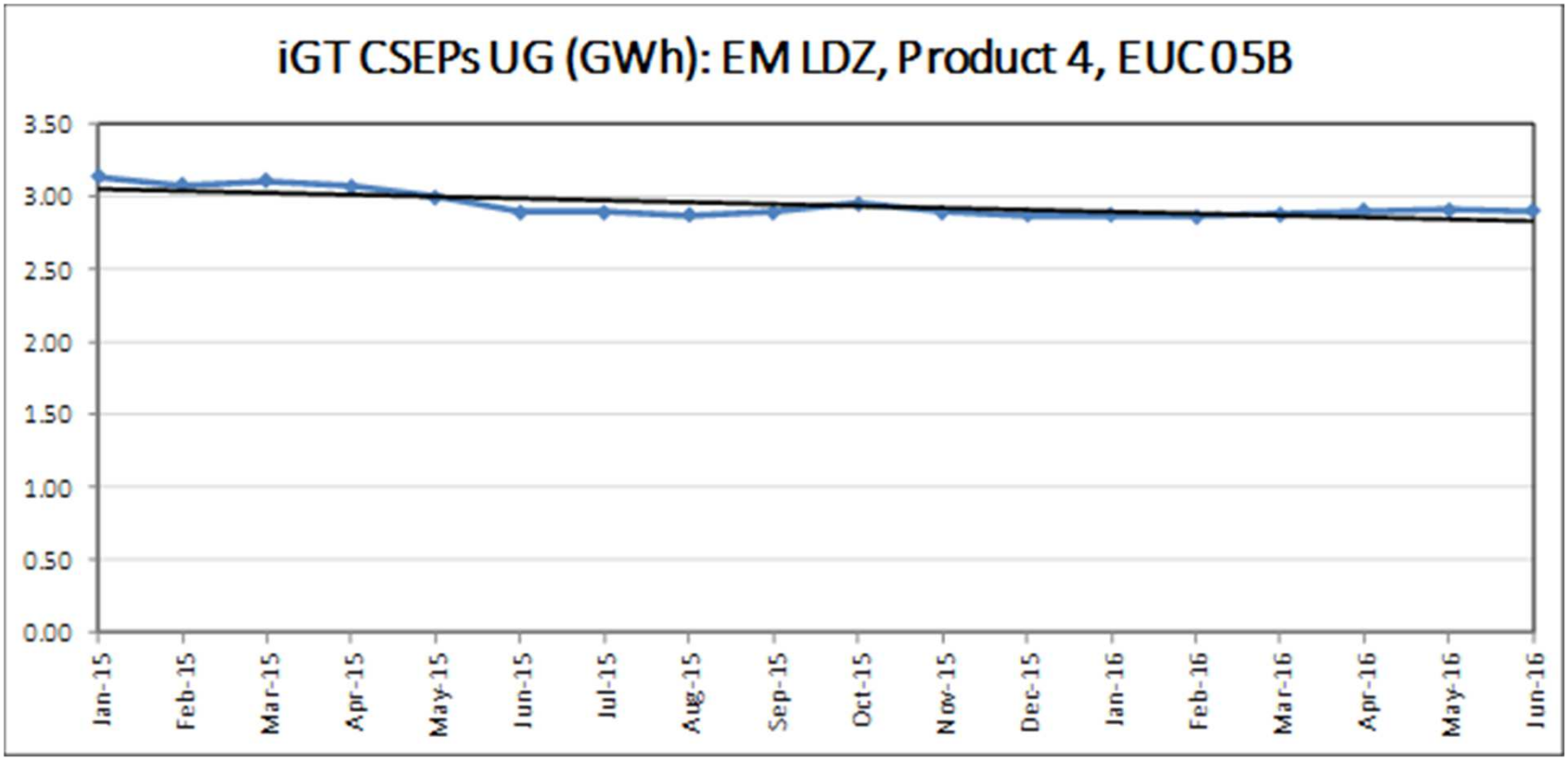
- EUC split taken from Registered sites on known CSEPs
  - Applied to Unknown Projects
- Add UG from Unregistered sites on known CSEPs

- Split between Products for each EUC
  - Use rules previously defined

- Split between Temporary and Permanent using existing rules
- Trend over time → extrapolate to forecast year

iGT CSEPs – Example Trend

Example from EM LDZ – one of 468 trends for iGT CSEPs UG



Consumer Meter Errors

- Limited data available
- Meter capacity report

- Identify meters operating at extremes of their range
- Use AQ and Meter Capacity from report
  - Under 1% of capacity → under-read
  - Over 95% of capacity → over-read

- EUC from AQ
- Split between Products for each EUC
  - Use rules previously defined

Consumer Meter Errors

- Calculate net over/under read for each EUC/Product combination
- UG from this source all Permanent
- Data limited to single point in time
  - No trend
  - Assume consistent over training period and forecast period

Shrinkage Issues

- Shrinkage Error
  - This is not Unidentified Gas but current process results in it ending up included in the UG total
  - Dealt with here as an interim measure
  - Current best estimate is that Shrinkage is under-estimated by ≈20%
  - Quantified using Shrinkage statements and split by throughput
  - Results in UG in **all** EUC/Product Classes, including Product 1 and EUC 09B

- CSEP Shrinkage
  - No CSEP element in current Shrinkage process
  - Dealt with here as an interim measure
  - Current best estimate is that CSEP Shrinkage is ≈3.5% of total Shrinkage
  - Quantified using Shrinkage statements and split by CSEP throughput

Theft

- Undetected Theft is the main component of the Balancing Factor
- Historic detected Theft affects the total UG calculation for the training period
- Theft data for full training period available
- Required as aggregate figure for each LDZ only
  - Individual figures for each training year
- Most UG from detected Theft is temporary
  - When it is detected within reconciliation period
  - UG from Thefts detected later than this goes into Balancing Factor
- Feeds into Consumption Method calculation for total UG

Balancing Factor Split

- Mainly undetected theft
- Split based on throughput for site categories that can be subject to theft
  - 08B and 09B excluded

- High limit: Smart Meters and AMRs have the same theft levels as other meters
- Low limit: Smart Meters and AMRs have no undetected theft
- Best estimate – midpoint

	01B	02B	03B	04B	05B	06B	07B	08B	09B
Product 1	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Product 2	0.573%	0.043%	0.034%	0.284%	0.232%	0.475%	0.644%	0.000%	0.000%
Product 3	0.860%	0.064%	0.050%	0.413%	0.290%	0.242%	0.189%	0.000%	0.000%
Product 4	77.301%	7.083%	5.546%	2.065%	1.452%	1.212%	0.946%	0.000%	0.000%

UG Factors

Supply Meter Point Classification	Product 1	Product 2	Product 3	Product 4
EUC Band 1	1.170	5.599	5.603	10.548
EUC Band 2	1.170	5.521	5.511	10.902
EUC Band 3	1.170	5.673	5.647	10.782
EUC Band 4	1.170	5.810	5.821	6.737
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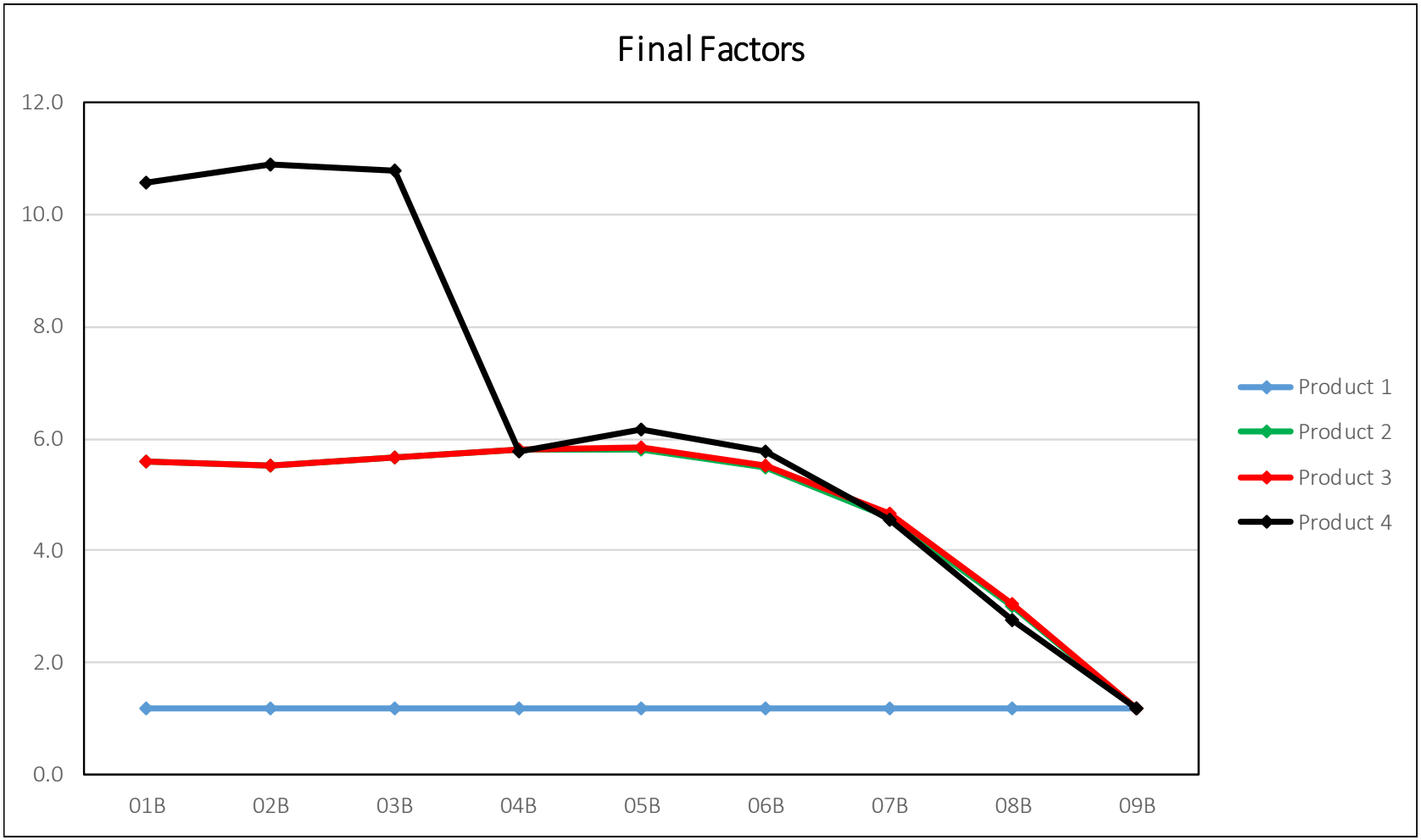
EUC Band 6	1.170	5.469	5.515	5.763
EUC Band 7	1.170	4.603	4.652	4.544
EUC Band 8	1.170	3.028	3.060	2.770
EUC Band 9	1.170	1.170	1.170	1.170

These UG Factors have been superseded.

See https://www.gasgovernance.co.uk/augenex/1718

"30 June 2017 Final Factor Table Letter" for latest UG factors

Final UG Factors



Thank you

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