

AUG Expert responses to issues raised by ICoSS during the query period for the first draft 2017/18 AUG Statement, 14 March 2017.

Below are the issues raised by ICoSS. Following each issue is the AUG Expert's response in italics. Note that only the points made by ICoSS that require a response are shown here – their comments in full can be found in the original document. Should you need any clarification regarding these responses or have further questions, please contact the AUG Expert at AUGE.software@dnvgl.com.

Summary of Issues (ICoSS)

- The proposed changes to the distribution of Unidentified Gas will result in more of the current market being allocated Unidentified Gas despite there being no evidence to suggest a change in behaviour of these consumers.

This comment is based on a misunderstanding of how the UG patterns are derived – the method actually reflects the scenario where customers have a tendency to maintain their behaviour when they have a Smart Meter installed and are potentially moved to a new Product Class. UG from Product Classes 2 and 3 does not come from (currently DM) sites that were previously assumed to produce no UG, it comes from sites that are currently classified as SSP or NDM LSP, which do attract UG. Under Project Nexus rules any such sites that have a Smart Meter or AMR can be assigned to Product Class 2 or 3, hence bringing UG to these Products.

It is recognised that sites that are classified as DMV in the current system will now reside in Product Classes that attract UG due to the presence of other sites in the same Classes. The result of this will be that any Shipper whose portfolio in these Classes includes only former DMV sites will now incur UG charges where previously they did not. This is unfortunate, but it is unavoidable in a system where UG is split on the basis of Product Class and EUC. We are required to work within this framework and hence cannot exempt former DMV sites from UG charges.

- The likelihood of sites with remote meter reading capability that are being daily read and settled being able to steal for at least three years without detection is highly unlikely (as demonstrated by the actual experience of DMM and DMV sites) and should be treated as contributing no Unidentified Gas. With the introduction of TRAS the amount of information available on daily meter site behaviour will increase, which will increase the likelihood of detection.

TRAS's initial response to our data request was that they were unable to provide us with any information. With help from the industry the situation has been improved and we are actively pursuing data from this source, which may help the analysis. With regard to AMR sites, theft detection relies on identifying changes in consumption patterns at a particular site, so if it is already stealing at the time it transfers out of Product Class 4 and maintains the same usage pattern it is quite possible for the theft to remain undetected despite the presence of daily readings.

The available asset data does not have a reliable Smart Meter/AMR indicator, which makes it impossible to check the prevalence of theft from AMR by cross-checking the MPRN on sites where theft has been detected. As shown below in more detailed answers, the number of sites recorded in the asset data as having AMR is tiny compared to the true figure.

- Actual and relevant data is in existence and available through reported theft records to enable the AUGE to extrapolate the distribution of undetected theft through the market with a high degree of confidence. However this data has not been assessed resulting in an unacceptable allocation of Unidentified Gas in some sectors.

As referenced above, unfortunately this data is highly inaccurate and cannot be used for this purpose. It was assessed as part of the UG analysis and had to be rejected for this reason. This will be explored in more detail in the sections below. In principle, we agree that the use of detailed data on a theft-by-theft basis would be of great use in ensuring the accuracy of the output, and it is hoped that as time goes on this becomes available (either through Xoserve or TRAS). As things stand, however, this data cannot be used due to its level of inaccuracy.

- The likelihood of theft from daily read versus non-daily read, and sites with Smart/AMR or dumber meters can be logically evaluated, but this is a sub-optimal approach compared to the use of actual data.

We agree that this method is not ideal, but with the data currently available it is the only approach possible. As and when accurate actual data becomes available we will endeavour to use it.

The AUGE should re-evaluate the assumption that all Unidentified Gas comes from downstream theft.

Balancing Factor

Theft (deemed to be the main cause of the balancing factor) is a behavioural phenomenon and not circumstantial (i.e. certain sectors of the market are more/less likely to contribute than others as opposed to how a shipper manages its settlement process with Xoserve). The AUG process has been running for a number of years and there is general approval for the methodology to split Unidentified Gas across the population according to factors which influence the behaviour of a consumer.

Agreed. This is the principle we have used in the current analysis.

The AUGS for 2017 makes assumptions due to this perceived lack of available analytical data, for example, the comparable level of difficulty of stealing from an AMR or Smart meter and that from a periodically read dumb meter.

As we set out below, there is currently a sufficiently large sample size from reported detected thefts that will allow the AUGE to determine with far greater accuracy the sources of Gas Theft than any high-level assumptions made using publicly available data.

Accordingly we fundamentally disagree with the proposed framework to allocate the balancing factor aspect of Unidentified Gas for four key reasons:

- There is a robust data sample that the AUGE can utilise to assess the distribution of Unidentified Gas.

Unfortunately this data is extremely inaccurate and cannot be used for this purpose. This is discussed further below.

- When assessing the current framework, we acknowledge that the AUGE has set its proposals out in the absence of any assessment of existing information, but we do not feel it is an appropriate starting point as it departs from the well-founded principle exercised in previous AUGE statements; daily read sites are highly unlikely to have theft downstream of the meter undetected. *The proposed AUG methodology does not depart from this principle – it is based around the principle that sites that do attract UG will move into daily metered Product Classes under Project Nexus and will not alter their behaviour just because of their Supplier’s read frequency. The assumption of no UG for DM sites in the previous AUGS was based on the sites that are Daily Metered under the existing regime: this will change under Project Nexus and a much wider variety of sites can and will become Daily Metered, attracting UG to this category.*
- Publicly available information can be utilised to assess the number of Smart and AMR devices in the market to greater accuracy than the information that has been used to date. *We are grateful to ICoSS for making us aware of this data source, which will be used in the calculations for the next draft of the AUG Statement. It is acknowledged that our broad-brush figure of a 20% Smart Meter roll-out as of October 2017 is likely to be a little high, with the true figure likely to be closer to 16%.*
- Shrinkage error should not be assumed to be zero. *We are aware that the Gas Retail Group study into the Shrinkage Model identified potential bias in its output, which could lead to under-estimates of up to 20% in Shrinkage figures. We are in the process of reviewing this document in detail and will include an allowance for this error in the next draft of the AUG Statement.*

Data Sources on Gas Theft

It is disappointing that the AUGE has used only two sources of data that have been provided to it on which to assess its initial view of the sources of Gas Theft.; Xoserve (central system) information and the limited industry responses sent to it by shippers in response to an information request in late 2016. With the latter the AUGE should exercise due caution as the data sets will inevitably represent the views of those companies with sufficient resources to enable them to be able to respond at the time.

The data request was sent on 15th November and asked for responses by 2nd December. This is a period of two and a half weeks, and as such we believe that any Shipper wishing to respond had the opportunity to do so.

We are extremely disappointed that the TRAS been not been proactively engaged and has not provided information on theft detection rates. In future years we expect that as a minimum the AUGE ensures it has access to this data, if necessary by proposing adjustments to the SPAA (that can be taken forward by the SPAA EC or suppliers) to compel it to support the process and provide this information via its contract.

We are equally disappointed about initial progress with TRAS. Our request for data was rejected, and so pressure from the wider industry was required in order for progress to be made. This is now ongoing,

and we have engaged directly with TRAS at their meeting on 6th April. We are not a code party and have no power to propose amendments to the UNC or SPAA, but we welcome any amendments by those with this authority that will result in TRAS being obligated to supply data.

It should be noted however that there is a requirement on suppliers to inform Xoserve of any theft so that settlement can be adjusted and we believe that there is a sufficient body of information to allow a robust calculation of the data size already available for Xoserve to utilise.

The theft information itself is sizeable, but a number of factors prevent it from reflecting Smart Meter and AMR theft accurately. This is discussed in more detail below.

Confirmed Gas Thefts

Since 2012, gas suppliers have had a requirement (Supplier Licence Standard Licence Condition 12A) to actively investigate sites for theft. This has resulted in a substantial increase in the number of thefts investigated and confirmed. Since the implementation of this new requirement over 12,000 confirmed theft cases have been reported, resulting in around 3% of the total theft in the market being detected each year.

Table 1: Detected Gas theft against Unidentified Gas estimates - ICoSS assessment of Xoserve and DNV GL published data

Gas Year	Confirmed Valid	Confirm valid with energy amount provided	Adjustments to settlement (GWh)	AUGE calculated Gas theft (GWh)	Proportion Detected
2012/2013	3348	3177	163.0	4618	3.529%
2013/2014	3152	2895	142.3	4618	3.082%
2014/2015	2807	2500	121.4	3779	3.212%
2015/2016	2926	2765	219.2	5816	3.769%

This welcome upswing in theft detection and reporting is the result of the increased obligations on suppliers under SLC12A of the suppliers' licence. The AUGE is correct in its statement that all such detections will have been captured in settlement.

The number of sites and the scale of the detection (along with the consistency of volume derivation), means that these statistics can be used as a robust sample size to assess undetected theft.

We note that the Shrinkage calculation currently uses leakage volumes which have a 90% confidence level attributed. Using the same confidence level for this date set, we estimate an error interval of between 3.74% and 3.8% can be achieved.

Data for these cases will be available to determine how this benchmark sample of cases is apportioned over EUC bands and more importantly the presence of daily read AMR or smart metering data. Considering the financial impact involved in the UG process, it is unacceptable to implement a significant change to the methodology to determine where theft of gas is found without the receipt and analysis of the most relevant dataset available.

The current information dataset which Xoserve has is therefore of a suitable size (statistically significant) to allow the AUGÉ to determine with a high degree of accuracy the distribution of theft against consumption levels, so allowing the UG factor to be calculated. As shipper-responsible theft will in the vast majority of number of cases be linked to a specific site (as opposed to theft in conveyance which is the responsibility of the transporter) the MPRN will be available for each theft. This will allow assessment of the meter type at the site.

Considering the size and diversity of these statistics and the ease by which they can be translated onto the AUGÉ table, we ask how any form of assessment of information from shipper or public sources will be as robust?

The available asset data source is too inaccurate to be used for an assessment of theft from Smart Meters and AMR for the following reasons:

- 1. The proposed method involves using the MPRN of each theft record to query asset data to determine the meter type at the site. There is no mandatory meter type field in the asset data, however, and the presence of AMR or a Smart Meter is frequently omitted. The lack of a requirement to store this information and the informal method of doing it when it is recorded result in significant under-recording of these assets. The following data is taken from the most recent asset data supplied by Xoserve.*

	01B	02B	03B	04B	05B	06B	07B	08B	09B
Traditional	20,854,629	191,541	45,528	18,889	4,545	1,474	508	187	0
DM	37	22	20	56	77	243	198	231	283
AMR/Smart	724,915	613	141	33	10	2	1	1	10
Total	21,579,581	192,176	45,689	18,978	4,632	1,719	707	419	293

This shows that despite there being a legal requirement for all EUC 04B and above sites to have AMR (and a confirmed compliance rate of at least 86%), as far as the asset data is concerned, out of approximately 27,000 such sites, only 57 have it. It is therefore impossible to accurately confirm what type of meter is present at each MPRN using the asset data, and it is little surprise that no such queries returned a hit on an AMR device when only 57 of them are recorded.

- 2. The Smart Meter population is likewise under-recorded. The confirmed number of Smart Meters in existence is 2.04m, but the asset data contains only around 700,000. Again, this means that it is impossible to accurately assess the level of theft from Smart Meters by checking the MPRN in the asset data.*
- 3. The Smart Meter population is very new and theft detection can take up to 8 years. Therefore historic detected theft data would not reflect the true level of theft from them even if the asset data was accurate, because the Smart Meter roll-out is still in its infancy. Detected theft can only ever be a reasonable indicator of all theft for a mature and stable process, and Smart Meter roll-out is neither of these.*

Though we consider that there is no requirement for the AUGÉ to attempt to determine the propensity of theft by assessment from other sources than that is available to it via Xoserve, we have

provided a response to the areas of the AUGS that attempt to ascertain the likelihood of theft occurring at different sites depending on meter type.

Proposed Methodology for determining balancing factor weightings

We are greatly concerned by any attempt to use unfounded assumptions to adjust the scaling factors between EUC Bands and product types. This will inevitably result in an inequitable allocation of Unidentified Gas.

If such an attempt however is to be made then the proposals should be based on an assessment on the regulatory, technical and commercial frameworks that will exist in October 2018, as well as past assessments in this area.

Regulatory Framework in October 2018

As the AUGS will be aware, there are a number of legislative and code requirements on suppliers that will impact the number of meter reads that must be submitted to a customer:

- The CMA remedy regarding Gas Settlement requires that suppliers send in a read each month for Smart and AMR site, from April 2018. Similarly suppliers must submit a read each year for dumb meters. These changes are being progressed via UNC modification 0594R and UNC modification 0570 respectively. It is important to note that the CMA default position is monthly reads from April 2018 for all advanced and smart meters i.e. this will not require a modification
- Daily read sites (products class 1 & 2) are obliged to submit reads on a daily basis, irrespective of the meter type at the site (i.e. shipper-supplied AMR or transporter provided metering equipment, which in many cases is identical).
- In addition sites with an Annual Consumption greater than 293,000KWh are required to be monthly read.
- If a shipper does not provide reads then the must read process will intervene. For Product Classes 2/3 this will after 4 months, for annual read sites this will be not for at least 12 months.
- The TRAS will have access to all of the meter readings submitted by suppliers regarding a site. Monthly read submission will mean that outliers at AMR and Smart sites will be picked up far more quickly than sites with dumb meters.
- All current DMV sites (Daily metered sites with an AQ < 58.6m kWh) will migrate from Class 1 within 6 months following Nexus Go-Live. These can be re-classified as either 2, 3 or 4 (classes 2 and 3, assuming the DM equipment is AMR compliant) depending on the shipper's settlement strategy. The proposed AUG methodology will see that all of these existing DMV sites will be subject to Unidentified Gas charges for the first time even though there is no change to the behaviour on site.

This analysis is based on a misunderstanding. There is no assumption that existing DMV sites will begin to attract UG (and hence have to change their behaviour to do so) – the UG for Product Classes 2 and 3 comes from other sites (that are currently NDM LSP or SSP and hence do attract UG) transferring into these Classes and maintaining their existing behaviour, hence making these Product Classes a source of UG under Project Nexus.

The table above shows that there are 847 existing DMV sites, according to the most recent asset data received from Xoserve. Under the current assumption of a 20% Smart Meter rollout (which will be amended in line with the more accurate figures that we now know are available), the combined population of Products 2 and 3 (EUC 02B and above only) will be 7449. They are therefore overwhelmingly composed of other sites moving into these Product Classes, maintaining their current behaviour, and hence bringing UG to them, rather than any change in behaviour of the relatively small number of existing DMV sites.

As stated above, it is acknowledged that sites that are classified as DMV in the current system will now reside in Product Classes that attract UG due to the presence of other sites in the same Classes. Unfortunately this situation cannot be avoided in a system where UG is split on the basis of Product Class and EUC.

Examining the framework above, there are three key points that come out:

- The type of meter equipment at a site is immaterial, what is important is the regularity in which reads are received.
- Any abnormal trends in consumption at a Smart/AMR site will be picked up by the TRAS much earlier than for a dumb site. The AUGS methodology indicates that the level of increased difficulty in this case than stealing from a dumb meter (i.e. the daily read AMR meter is just twice as difficult to steal from). The 1:2 weighting proposed by the AUGS is insufficiently supported to stand up to logical thinking and unlikely to be supported by data when it becomes available.
- For sites which submit daily readings and show daily consumption it would be very difficult to steal gas as they show daily usage over the course of a reporting period.

The type of metering equipment at a site is material because it affects the type of theft that is possible (i.e. no index tamper on a Smart Meter). However, we agree that the read frequency is also important.

It is accepted that there is limited evidence to support the 1:2 weighting except that it lies midway between two extremes, both of which we know are unfeasible in practice. As explained in the responses above, however, there is no reliable information available to support a more data-driven approach. We are currently speaking to TRAS in order to ascertain what data they may be able to supply, and we will be actively pursuing a full analytical approach in this area as soon as the data required to support it becomes available.

Index tampers account for approximately 30% of thefts from traditional meters, which provides the starting point for reducing the theft level by 50% from that of a traditional meter. Whilst in some cases the site user will attempt a different type of theft instead, the index tamper is the safest and simplest method of preventing the meter registering how much gas has passed and many people are unlikely to resort to a more complex and dangerous method such as a bypass if they are unable to do it. Therefore, whilst the full 30% will not be realised, the inability to perform index tampers on a Smart Meter will reduce the theft level.

In addition, all respondents to our information request agreed that whilst it was currently unclear whether the higher granularity of data from a Smart Meter would result in more thefts being detected, it was very much expected that thefts could be detected more quickly. This in turn means that at any point in time T there is less active theft, due to thefts that would have still been as yet undetected on a

traditional meter having been detected and resolved. This adds to the “index tamper” effect. It remains early days in the Smart Meter rollout, however, and so the magnitude of the “quicker detection” effect is also unknown.

The government’s Department for Business, Energy & Industrial Strategy have made some estimates in this area as part of their Smart Meter Roll-Out Cost-Benefit Analysis, however. In this they state that the level of theft from Smart Meters due to quicker detection is likely to be 20-33% lower than that from traditional meters, although they purposely use a conservative figure of 10% in their cost benefit calculations. When the Index Tamper effect of up to 30% is added to this, the result is consistent with our own estimate of a 50% reduction. There is certainly no evidence to favour a different figure.

It is also worth noting that the presence of daily readings does not make gas theft impossible (a position backed up by the Department for Business, Energy & Industrial Strategy analysis). The above “quicker detection” logic largely refers to theft beginning on a site where previously there was none – the presence of more frequent readings means that this situation should be picked up more quickly, as agreed by all respondents. The analysis is always aimed at detecting changes in behaviour, however. Where a new user arrives at a site and immediately starts stealing gas it will not necessarily be possible to detect this because the change corresponded with a change in user, which is a quite reasonable explanation for it without theft having to be involved. This is the case regardless of the meter read frequency. Likewise, if a user who steals gas has a Smart Meter installed and continues to steal, there will be no step change to detect – the new, more frequent, readings will just confirm the same level of consumption as was present previously.

Therefore, it is clear that whilst Smart Meters and the improved quality of information they supply will assist the theft detection process, they do not make theft impossible nor guarantee its detection. The “no theft” limit is therefore just as unattainable as the “same theft as a dumb meter” limit, and the true level lies between the two. The current mid-point approach is therefore reasonable in the circumstances, and consistent with other published figures.

Installation of Smart and AMR devices

For AMR meters, the vast majority of such installations are in accordance with the ASPCoP, which applies to ESTA members. Note that these obligations are in addition to what applies under MAMCoP that governs all meter installations and is currently administered by SPAA. These additional obligations require that any AMR installation (in addition to the meter installation) will allow provision of accurate meter readings remotely and be installed only in a safe environment. ICoSS has confirmed this with the ASPCoP9. Therefore at the point of installation the meter will be inspected and so theft will be detected. It should be noted that for sites with an AQ>732MWh, all such sites are required to have had such meters installed in the last few years. In addition, as noted below a substantial proportion of the SME has already had an AMR device fitted and the rollout will be continuing until April 2018.

For the Smart Meter Installations there are no specific requirements for the installation to work to a standard higher than for dumb meters, but any installation of a Smart Meter requires the physical replacement of the meter, meaning that the gas flow to the site is interrupted. The nature of such

installations are therefore that gas theft will be detected (as it is a bypass downstream of the ECV which continues to flow after the meter is removed) or will be interrupted (as the tampered meter is removed).

For both Smart and AMR meters therefore the chances of a site continuing to steal after an installation visit is very small, if the theft is downstream of the meter.

Whilst we agree that after a dumb meter is changed for a Smart Meter or AMR is installed the number of sites continuing to steal will drop, we do not accept that the proportion that continue to steal will be very small. Meter replacements are by appointment and anyone stealing gas is highly unlikely to knowingly leave evidence of the theft: they will attempt to make the meter look like it has not been tampered with (although not necessarily successfully). As already noted, the only theft method that is impossible on a Smart Meter is the index tamper, and whilst the unavailability of this relatively safe and easy method will prevent theft in a number of cases, people stealing by other means (e.g. bypass) will simply be able to set their system up in the same way as before the meter change. This has the additional benefit of maintaining the previous consumption level and hence not arousing suspicion.

Again, whilst this does no more than pointing to our midpoint approach being reasonable, it means that there is no evidence to favour a different figure.

Impact on Unidentified Gas

The AUGE has identified two key differentiators in determining whether a site will be more or less likely to steal gas; whether it is a DM site or whether it is has AMR or Smart meters installed.

The AUGE indicates in page 47 of the draft AUGS that of over 15,000 detected theft records covering an 8-year period (as noted above 12,000 of these are from 2012), none are from EUC08B or 09B sites, which can be attributed to the greater scrutiny of these sites. The greater scrutiny of these sites is due to the fact that they are daily read in the main (the majority of EUC Band 08 sites are DMV); it logically follows that any site that is daily read will have no theft as there is no other difference between an DMM/DMV site and an NDM site apart from the number of reads taken (in fact some DMV sites will have a lower annual consumption than an NDM site).

*This analysis applies to any site that is **currently** daily read under the existing regime. The new regime changes this by making far more sites daily read, some of which will be stealing gas and which can, as described above, continue to do so.*

As the frequency of meter readings, not the metering equipment is the key determinant, it follows that the current operating regime strongly suggests that the actual level of theft from sites with any form of AMR or Smart device operated in the same manner as a DM site is in fact zero and so sites that are daily settled should be treated as attracting zero theft, rather than the 50% factor currently allowed for.

This does not follow. It only follows that existing DMV sites will not suddenly begin to steal gas, which we accept.

When assessing the difference between classes 2 and 3, the only difference is the settlement granularity (i.e. settled daily on daily submitted reads for Class 2, or settled periodically on daily reads submitted in batches for Class 3) and not the likelihood of the site to contribute to undetected theft. Therefore a site with identical metering and daily read AMR equipment and identical AQ's will be subject to different Unidentified Gas Factors depending on the shipper's settlement strategy (i.e. electing to classify the site as Class 2 or Class 3). This is a contradiction to the approach of targeting likely contributors of undetected theft. It is our recommendation therefore to maintain the existing and accepted methodology that sites that are settled daily (currently restricted to DM sites) is exempt from Unidentified Gas charges on the grounds that daily reads sites don't steal gas or are identified through the TRAS process.

The factors for Products 2 and 3 are in fact very similar and usually only differ at the second decimal place. This reflects the position that the theft propensity from the two sources is the same, as suggested. The minor differences are due to the directly-calculated UG elements from the two Products.

With regard AMR/Smart Metering sites that do not submit daily reads, then the situation is more complicated. Such sites will, as set out above, have had any historic theft detected during installation, but there is a chance of a new theft incident occurring if the site is not read on a regular basis. The likelihood of a new theft occurring can be estimated by comparing detected theft record's with the metering present at the site. This is backed up by information provided by ICoSS (as well as BES and DONG energy), who collectively supply 80% of the >73.2MWh market and have confirmed that they have found no thefts in the last 5 years at AMR sites.

Given that the asset data only accurately records 57 out of 27,000 AMR sites, it is no surprise that no thefts have occurred on MPRNs recorded as having AMR. The true situation cannot be ascertained using the inaccurate asset data.

Though the above assessment can give a rough picture of gas theft splits between meter types, for the avoidance of doubt such an assessment is sub-optimal; a true picture of theft distribution can be gleaned from the information already held by Xoserve.

We are keen to move to a proper analytical approach to theft split and we will do so as soon as the data exists to support it.

Smart and AMR Population Estimates

BEIS currently publishes a quarterly report that sets out the number of sites that have some form of smart or AMR device. This information is based on large suppliers' submissions. The large suppliers that currently report into BEIS represent the vast majority of the domestic market so the aggregate of their current portfolio is a suitable assessment for the current number of Smart Meters installed in domestic properties, as well as the rollout rate.

As of 30 September 2016, the report indicates that there were 2.04m Smart and Smart-type meters installed at domestic properties. For the period June to September, 353,700 meters were installed. Though there are statistics for this rollout going back 2012, the nature of the Smart Metering

programme means that the most valid installation rate is the latest value as the programme gathers momentum.

Assuming that the installation rates remain steady we anticipate that around 3.4m Smart Meters will have been installed by the commencement of the 2016/17 gas year. By comparison there are 21.7m domestic gas meters in the GB market. This gives a ratio of 16%

This is lower than the broad-brush estimate of 20% that we used and we will incorporate information from this source into an improved estimate in the next draft of the AUG Statement. Information regarding the availability of data such as this is extremely useful and is gratefully received.

Large I&C AMR sites

For the largest customers, Supplier Licence Condition 12 has required that since 6 April 2014 all sites with an AQ>732MWh (EUC Bands 4-9 and all DMM sites) has had an AMR device installed (subject to the reasonable endeavours obligation). Though several organisations have failed to ensure that all such sites have been installed with an AMR device, Ofgem12 in August 2014 indicated that 86% of eligible sites have had an AMR device installed. Considering that over 3 years will have elapsed since then, with Ofgem enforcement action occurring in the meantime, we expect the installation rate to be 95% if DM sites supplied by transporters are included.

Using these data sources, a reasonable estimate of Smart and AMR rollout rates can be determined:

Table 3: Percentage of sites capable of moving to Product Class 1-3 by 1 October 2017 – ICoSS analysis

	EUC Band	% capable of moving product class
Domestic Smart Meters	1	16
SME customers	2-3	20
Mandatory AMR	4-8	95

Again, this information is extremely useful and is gratefully received.

Shrinkage Error

ICoSS disagrees with the assertion that the balancing factor can only be made up of gas theft that occurs downstream of the Emergency Control Valve, i.e. is shipper responsibility. Whilst we acknowledge that the shrinkage error is difficult to quantify, there are a number of mechanisms by which an estimate can be ascertained, in particular by reference to existing publically available documents, such as the EUK shrinkage assessment that was commissioned by EUK and presented to the shrinkage forum in January 2016. In addition the TRAS is, as part of the mandatory reporting on suppliers, is provided with details of sites that are found to be stealing upstream of the ECV.

The AUG should undertake a true assessment of shrinkage error and report separately on its materiality using the sources identified above as well as any additional data sources it has identified.

We are currently reviewing this document and will make a decision on the relevance of its content to the UG analysis. Any changes will be incorporated into the next draft of the AUG Statement. It is important when carrying out such an analysis not to confuse uncertainty with bias: uncertainty in the output of the Shrinkage model reflects the typical level of unbiased error in the results (i.e. non-zero errors that sum to a value close to zero over time), whilst bias reflects a systematic shift from an average error of zero.

The UG calculations should only be amended if there is strong evidence for the existence of such bias. If this does exist, it will affect the UG calculation as follows:

- If the shrinkage estimate is biased towards being consistently too low, the overall UG estimate will be too high. It needs to be reduced to account for the shrinkage bias before it is then split into its Directly Estimated and Balancing Factor components and the factors calculated.*
- If the shrinkage estimate is biased towards being consistently too high, the overall UG estimate will be too low. It needs to be increased to account for the shrinkage bias before it is then split into its Directly Estimated and Balancing Factor components and the factors calculated.*