Title of Paper	**Data Improvement Strategy**
Author of Paper (Responsible)	Christopher A Wood & John O'Keeffe (PwC); James Crump (Ofgem)
Status of Paper	**4 – Draft for EDAG Review** 5 – Final Recommendation to DA
Timing	This is a draft of the Data Improvement Strategy for submission to the September User Group.
Dependencies	Discussions held with various members of Ofgem and parties within the industry, other activities being performed in the Switching Programme, discussions held with various solution providers.
Circulation	Workstream Leaders

Issue	How the switching process can be improved through the cleansing and enhancement of industry data.		
Impacts Domestic?	Yes	Impacts Non-Dom?	Yes
Summary of Recommendations	We propose to introduce requirements to: • Require DCC (or the CRS operator) to procure an external database of premises address data as part of any Switching Service, which will attach high-quality address data to MPANs and MPRNs and which will be available to participant in that system; • Introduce a requirement for suppliers to verify meter technical information provided by meter operators against that held in industry data sets; • Introduce a requirement for DNOs and GTs to identify properties which have no postal addresses, and make reasonable endeavours to resolve these issues; • Where address data issues are not resolved by the above measures, investigate the possibility of using Smart Meter installation visits, or data returned from these visits, to improve industry address data.		

Internal and External Engagement	
Business Process Design	Assimilated Feedback following high level walkthrough meeting
Solution Architecture	Assimilated Feedback following ongoing interactions
Regulatory Design	High level route to code changes captured
Delivery Strategy	Dependencies captured
Commercial Strategy	NA
DIAT	One version prior to this shared during w/c 12 September
Legal	NA
Other Ofgem Teams	NA
PwC Panel	NA
Meetings at which this paper has been discussed	
Workstream Leaders	One version prior to this shared during w/c 12 September
User Group	May, June and July User Groups have been engaged on

	Approach, Problem Statement and direction of travel of Strategy
EDAG	13/10/2016
Other External	NA
Ofgem Design Authority	27/10/2016

1. The Issue

The aim of the Switching Programme is to enable faster and more reliable switching of energy supplier. Inadequate quality of industry data has long been acknowledged as one of the key factors resulting in delayed or failed switches. Where data held by industry participants contains errors, this can result in customers being incorrectly billed, in energy being provided to an incorrect supply point, and in suppliers trying to effect a switch not being able to locate a customer's supply point. The effect of all of these factors is to undermine customer confidence in processes used to switch energy supply.

The objective of this document is to develop a strategy for improving data quality as part of the Switching Programme, and therefore making switching more reliable. This Strategy forms part of the Blueprint Phase of the programme. The aim of this Strategy is to suggest possible remedies which will improve the quality of switching data. These remedies have been tested with consultation in our industry User Group and Design Team. We will invite respondents to the Request for Information (RfI) to comment on these proposed remedies. Following this, a decision on whether to proceed with individual remedies, and development of the remedies themselves, will follow in the Detailed Level Specification (DLS) phase.

Based on one month's data supplied by 'Big Six' suppliers to Ofgem, we identified:

- Approximately 301,000 switches were attempted across all meter points (approximately 156,000 switches of electricity supply and 145,000 of gas supply);
- Of these, approximately 4% of domestic electricity and 8% of domestic gas switches were cancelled or rejected and fail to be processed (based on data for five consecutive quarters);
- Over 0.8% of these switches were erroneous transfers (i.e. where an incorrect meter point was switched;
- Approximately 4% of total switches were delayed (based on the same month's figures), with approximately 1.6% of switches delayed by more than seven days and 0.7% of switches delayed by more than 14 days.

We conducted a separate programme of stakeholder engagement as part of our work on data quality. This engagement indicated that by far the biggest contributor (82%[1]) to both delayed and failed switches is poor quality data. In addition, the qualitative assessment of respondents to our engagement programme indicated that around four-fifths of failed switches occurred due to poor quality address data. Respondents were clear that our focus should be on address data.

With this in mind, and based on our assessment of industry data and our programme of stakeholder engagement, we have devised a programme of remedies which may be carried forward, with the aim of improving industry address data. These remedies are intended to be part of or complementary to the Switching programme, but not all are dependent on the implementation of a particular Solution Architecture model as part of the Programme. We have conducted a (largely qualitative) assessment of costs and benefits of the different remedies, but would invite input from interested parties with regard to the costs and benefits and also the likely effectiveness of these remedies in resolving problems with address data. We will work with industry to better understand the costs and benefits of each option and, consulting as appropriate, take decisions on which, if any, to take forward as part of the switching programme.

[1] This, along with other numbers and statistics quoted in this document, is based on a combination of data samples and statistics provided by various parties. Some of the analysis required aggregation and subjective inference to obtain.

We will work with industry to better understand the costs and benefits of each option and, consulting as appropriate, take decisions on which, if any, to take forward as part of the switching programme.

It should be noted that we consider Data Improvement to be a continuous process, and that whilst a decision has been made at this stage to concentrate on address data. This does not mean that we do not consider that there may be data issues contained in other industry data sets. Improvement of address data may uncover issues with other industry data sets, possibly those which are used in billing of customers and settlement of accounts. This strategy should not preclude other industry attempts to improve this data and continuous data improvement by industry stakeholders.

The document sets out:

- The background to data issues;
- Quantification and evaluation of the data issues, based on stakeholder engagement and evaluation of industry data;
- Remedy options for data improvement;
- An evaluation of those remedies; and
- Next steps for data improvement work.

This document will be shared with the September Delivery Strategy User Group for feedback and input, and then with EDAG and the Ofgem Design Authority in October.

2. Essential Background

We have engaged in an extensive programme of stakeholder engagement to inform this Data Improvement strategy. To ensure that we capture a broad range of industry views, we have contacted Suppliers (new entrants and established major suppliers), Gas Transporters (GTs) and Distribution Network Operators (DNOs) independent Gas Transporters (iGTs) and independent Distribution Network Operators (iDNOs), Price Comparison websites (PCWs) and other intermediaries, and providers of address reference data solutions.

We have conducted analysis of data provided by these stakeholders and also of data provided by suppliers to Ofgem and part of its ongoing market supervision. We have also collected qualitative data through discussions with these and other stakeholders. This analysis has informed the conclusions that we have drawn as part of this document and the remedy proposals that we have devised.

Through this, we have identified the key data elements which play a role in the current switching process. These are summarized in the table below:

	Application of the data		
Data element	**Used to identify physical location of meter point**	**Used to identify appropriateness of tariff and contract for customer**	**Used by provider for billing and customer experience**
MPAN or MPRN	✔	✔	✔
Meter Point Address	✔		✔
Supplier		✔	✔
Meter Serial Number	✔		
Profile Class (E)		✔	✔
Market Sector Code (G)		✔	✔
Meter Time Switch Code and other Meter Technical Info (E)		✔	✔

Switches are communicated across the industry using data flows. At present, when initiating a switch, a supplier sends either a D0055 Flow (electricity) or Gas Confirmation to a distribution network operator or Xoserve respectively. The D0055 Flow includes a minimum of the MPAN and the "Effective from Settlement date"[2]. The Gas Confirmation must comprise a minimum of MPRN and the Effective Date.

2.1 Related Industry Programmes

We have also considered two key industry programmes that will also have an impact on switching. These are Project Nexus and the Smart metering programme.

Project Nexus

Project Nexus is the proposed replacement for UK Link, and will provide a range of harmonised services on behalf of shippers and gas transporters. These include a single supply point register containing all iGT and GT supply points against which shipper invoicing and change of supplier and shipper can be recorded.

[4] The date from which the supplier wishes to take control of the meter point.

The Nexus project will change the way that iGTs handle data. Currently, switching can be delayed by delays in data flows to and from iGTs to Xoserve and then onto suppliers and the rest of the industry. Project Nexus should address these issues by processing iGT data and flows in exactly the same way as other Gas Transporters' data.

Because the scope of Nexus incorporates iGT data and data flows, and is expected to go-live in 2017, it is not recommended that any work be performed outside of Nexus to specifically improve iGT data or processes. Data cleansing strategies articulated in this document that refers to the provisioning of source gas data refer to the new UK Link Replacement system.

Smart Metering

Smart Meters will allow a customer's supplier to directly access accurate meter data. Smart Meters are currently being rolled out across the country, with an aim of ensuring that all eligible properties are equipped with Smart Meters by the end of 2020.

Smart Meters will have significant implications for the retail energy market and for the switching options available to consumers. More frequent and accurate consumption data will be provided to suppliers from consumers, making settlement easier, and meter information will be remotely accessible by suppliers without necessitating a site visit. This will make collection and updating of some industry data, such as meter type (identifying a prepayment or Economy 7 meter) much easier. Smart meters will also be remotely configurable to perform as a range of meter types, meaning that a wider range of products will be available to consumers.

Rollout of smart meters also presents an opportunity to improve meter and location data quality, for example by identifying incorrect or ambiguous addresses during the fitting process.

2.2 Other Industry Initiatives

There are two other critical initiatives that this strategy has also taken into account: the work of the Address Data Working Group, and the findings from the Competition and Markets Authority (CMA) inquiry into the energy market.

The Address Data Working Group (ADWG)

The Address Data Working Group (ADWG) is an expert group formed by Electricity and Gas Code Administrators to examine the use of address data in the industry. The ADWG published its cross-code report in November 2015.[3]

The ADWG's report assessed options for improving the quality of address data across the industry. In particular, it examined whether the adoption of Unique Property Reference Numbers (UPRN) would bring benefits to the industry and the potential for harmonising addresses across electricity and gas.

The ADWG's report fell short of recommending a cross-fuel mandate for the introduction of UPRNs, and concluded that "there should be no harmonisation of address format for gas and electricity at this time, as there is no evidence that this would deliver tangible improvements in address data quality". Other key conclusions of the report were that there were concerns about the risks and costs of introducing a new identifier (such as UPRNs) alongside MPANs and MPRNs and of migrating and final cleansing of unmatched

[3] ADWG: "Address Data Quality: Gas and Electricity Cross-code Report", November 2015

addresses, and also that there was insufficient evidence to support a cost-benefit argument for licensing of the Ordnance Survey's AddressBase product across the industry.

With regard to the incidence of plot-to-postal issues, the ADWG also noted that "better engagement and improvements to new connections processes [were] needed".

However, the ADWG noted that design of a Central Registration System within the Switching Service would need to take account of how address data was used in a new switching service.

Publication of proposed models for solution architecture creates the potential for a single resource, which have changed the context for data improvement. This may change the cost of procuring a single address solution across the whole industry and present the opportunity for central stewardship of address data for both fuel types. We have considered the findings of the ADWG whilst developing our remedies.

The Competition and Markets Authority's Investigation

The CMA recently developed a package of remedies for introducing competition in the energy market. Amongst other remedies, the CMA recommended that third-party intermediaries (such as PCWs) be given access to the ECOES (Electricity Online Enquiry Service) and DES (Data Enquiry Service) industry data enquiry services.[4] The aim of this measure is to enhance the ability of those intermediaries to improve engagement.

The practical impact of this remedy is that PCWs and other intermediaries would gain direct access to address data and other data which enables the switching process. The CMA's remedies are expected to be implemented by the end of 2016.

2.3 Dependencies within the Switching Programme

In developing this strategy, we have also considered the impact of other workstreams being developed within the Switching Programme.

Solution Architecture

Design of the solution architecture will be key to how data is managed in the new switching arrangements. In particular, the design of any Central Registration Service (CRS) will be key in deciding whether it will be possible to store address data centrally.

The Business Process Design team has drawn up a short list of three Solution Architecture options (in addition to a 'do nothing' option) for consideration in the Detailed Level Specification phase of the programme. These options are:

Do minimum:

Under this model, there will be no new, centrally operated switching system. Switching will be undertaken by existing systems (UK Link[5] and MPRS), which will be enhanced to allow next-day switching. Management information will continue to be provided by ECOES, DES and the existing systems held by market participants.

[4] CMA Energy Market Investigation, at https://assets.publishing.service.gov.uk/media/5773de34e5274a0da3000113/final-report-energy-market-investigation.pdf pp649-650

[5] Including any replacement for UK Link established by Project Nexus.

Switching database with middleware:
A centralised switching database with the necessary data elements to allow a consumer to switch will be developed and hosted centrally. Other management information will continue to be provided by ECOES, DES and the existing market participant systems.

Switching database and Management Information System (MIS) database with middleware:

As in the previous option, a centralised switching database with the necessary data elements to allow a consumer to switch will be developed and hosted centrally. In addition, a further centrally held Management Information System (MIS) with additional data elements needed by market participants to support additional switching activities will be created. The centrally held MIS will entirely or partially replace ECOES, DES and other existing market participant systems.

Data Modelling

In addition to their work on Solution Architecture, the Business Process Design workstream has developed a model of data elements which could be held in a central switching database and Management Information System.

Issues arising from this workstream are:

- Data held and mastered in the central switching database will be held, managed and stewarded centrally by the operator of that database;
- Stewarding arrangements for data held in the central switching database but mastered elsewhere will be unchanged (e.g. Meter Point Address will still be mastered in the DNO systems);
- Data held outside the central switching database, whether in existing distributed management information systems, or in an new central MIS will continue to be managed and stewarded as at present (for example Settlement Data such as Profile Class); and
- A new 'Premises Address' is being proposed as the key address variable in the central switching database, and will be both held and stewarded in the central switching database. The premises address is the address of the premises served by a meter point, whereas the primary address currently held in UKLink (Gas) and MPRS (Electricity) systems is the meter point address, which is the location of the meter measuring supply to a premises. In most cases, the meter point will be located in the premises it serves and thus these two data elements would be the same. However in some cases (such as some blocks of flats), the meter point will be in a location sufficiently different from the premises so as to have a different address. This definition affects our proposal for a central address database, which is discussed in our Remedies.

Data Migration

Any new CRS arrangements necessitating a central switching database will require data to be migrated from existing sources into that database. The Data Migration strategy sets out how we expect that this migration will be undertaken. Data cleansing will contribute to the success of the migration: any data cleansing should be considered alongside the migration. Given that the focus of the proposals below is on address data, migration of much of the data into the CRS (such as MPRN and MPAN details) will not be subject to a separate cleansing exercise; cleansing of existing industry address data will in effect form part of the migration of data into a new database.

Transition Strategy

The Transition Strategy will determine how the new Switching arrangements are brought to market, including the order and timing with which the components of the solution architecture are 'switched on'. Cleansing will need to be completed ahead of the 'go live; date for the CRS, regardless of which transition model is ultimately chosen.

The Transition Strategy may affect the timings of delivery for aspects of the CRS (considering whether this might happen as a 'Big Bang' or as part of a phased approach). This may affect how elements of the Solution Architecture are delivered.

3. Quantification and evaluation of the key data problems

In this section we identify the most common data problems which impact upon customer switching, based on our stakeholder engagement. Our work has identified four particular areas which result in data problems.

We have included quantitative data where it has been possible to obtain from our stakeholder engagement to give an indication of the scale of these problems. A more detailed breakdown of our findings is available in the Appendices to this document.

Problem 1 – Unreliable Premises Address data

Whilst the most reliable reference for switching a customer's energy supply is the MPAN or MPRN, which is printed on all energy bills, very few customers are familiar with these identifiers or where to locate them. As consequence result, address data, and particularly the Meter Point Address, is commonly used as proxy in order to identify the meter point when switching a customer's supply.

Our engagement with market participants, the Solution Architecture and Target Data Model teams has indicated that the Premises Address contained within the data model will be used as an indicator to identify a meter point.

Analysis from stakeholder engagement shows that approximately 82% of cross-fuel switching failures, delays and erroneous transfers are related to data quality.[6] Of these, 81% of these data issues relate to meter point-address alignment and the quality of overall address data. Extrapolating these statistics using our analysis of monthly switching data provided to Ofgem by 'Big Six' energy suppliers would suggest that on average approximately 12,000 customer switches per month at these suppliers fail due to address data quality.

Our stakeholder engagement identified some common themes related to address data:

- **Poor quality of flat addresses**. Flats and apartments can have different naming conventions, and in some instances individual flats may be known by multiple names (for instance 'Flat 1' may also be 'Ground Floor Flat').
- **Ambiguous addresses.** Addresses where the exact location of the premises is unclear.
- **Incomplete addresses**.
- **Multiple MPAN and MPRNs assigned to properties**. This can happen in error (for example in new-build properties) or in complex commercial properties.
- **Unusually named properties** (including vanity addresses). Some customers may choose to refer to their properties by an invented name (such as 'The Willows').
- **Inconsistencies between the address data used in gas and electricity.**

Our engagement with PCWs indicated that approximately 8%[7] of customers failed to locate their address on their sites, and a limited number of these proceeded to enter their address manually in order to progress their switching enquiry. This indicates how address data can reduce consumers' propensity to switch.

[6] We asked suppliers to provide us with a sample of switching data as part of our Stakeholder Engagement programme. These figures are derived from that limited sample.
[7] Quoted by a price comparison website.

Problem 2 – Poor Meter Technical Information

Meter type and meter time switch code are key data items in ensuring that a switch can proceed. Where meter technical information is incorrect, this can result in delays to validation of a switch, customers switching to an incorrect tariff, and inaccurate bills being sent to consumers.

Our analysis showed that up to 14% of failed or delayed switches were caused by poor meter data. Extrapolating these statistics using 'Big Six' supplier data as above indicates that approximately 2,100 customer switches per month could fail due to poor quality meter technical data.

Problem 3 – Prevalence of Plot Addresses in Industry Data

According to our stakeholder engagement, approximately 1% of traded, energised MPANs in the electricity industry data have no proper postal address and are instead represented by a 'plot address'[8]. A plot address is a premises where address is given as the plot number designated by the developer rather than a full postal address apportioned by a local authority and held in universal address data. In many cases such plot addresses have remained in industry data for many years, and indeed they can remain indefinitely in address data until action is taken to address them. Plot addresses appear to be less prevalent in the gas industry, and our stakeholder engagement indicates that this may be due to central identification and remediation by Xoserve.

Plot addresses typically enter industry data where a new-build property is attached to an energy supply before it is issued with a postal address. This can happen for innocent reasons (for example a developer may want to use a property as a show home, or a local authority may be tardy in supplying postal addresses). At present meter point address data is typically owned by GTs and DNOs, for whom updating address data will not be a commercial priority. In addition, timely supply of postal addresses depends on actions of developers and local authorities, who are outside the boundary of energy regulation.

Prevalence of plot addresses means can cause delays in switching, and can even cause newly installed meter points to be unable to switch until the issue is resolved.

Our stakeholder engagement has revealed that in the case of one major network operator, 31% of these MPANs were found to date from 2005 or earlier, and 6% date from prior to 2000. The problem is less prevalent across gas transporter (non iGT) data held by Xoserve, which shows approximately 0.1% of meters are linked to plot addresses. However, this equates to approximately 26,000 gas meters.

Problem 4 – Crossed Meters

Crossed meters occur when MPAN and MPRNs are assigned to an incorrect meter point. As a result, an attempt to switch one of the affected meter points will result in a failure or erroneous transfer, and customers are billed for the wrong meter point. Crossed meters can be very difficult to positively identify after installation.

Respondents to our stakeholder engagement indicated that approximately 20% of the erroneous transfers that we sampled were caused by crossed meters. Based on erroneous transfer data provided to Ofgem by Big Six suppliers, this would indicate that approximately 500 erroneous transfers per month would be due to crossed meters.

[8] This is based on the engagement of one very large distribution network operator and will likely vary between operators.

4. Data Improvement Remedies Assessment

The Data Improvement Remedies set out in this section aim to remediate the four issues identified.

Proposed Remedies against Problems

The table below illustrates how each of our proposed remedies addresses the problems raised.

	Solution to Resolve Problem				
Problem	**Remedy 1: Central Address Solution**	**Remedy 2: Improving Meter Technical Data**	**Remedy 3: Improving Plot to Postal Data**	**Remedy 4: Responsibilities upon smart installers**	**Remedy 5: Improving Process of Issuing MPAN and MPRNs**
1 Unreliable Premises Address data	●			◐	
2 Poor Meter Technical Information		●		◐	
3 Prevalence of Plot Addresses in Industry Data	●		●		
4: Crossed Meters				○	◐

Key

● Remedy mostly or entirely remediates the problem

◐ Remedy partially remediates the problem

○ Some benefit to remediating problem via this Remedy

Following User Group review, we have decided to remove Remedy 5 (Improving the Process of Issuing MPANs and MPRNs) from the package of remedies that we have decided to take forward. This is to allow further consideration of how this remedy could operate in practice and possible unforeseen consequences. However, we consider that the remedy may have merit and may be proposed in some form elsewhere. We have included our initial analysis of this remedy in Annex 3.

4.1 Remedy 1:Central Address Solution

Creating a central address database within the new Solution Architecture model, improving the quality of address data by procuring a comprehensive list of premises addresses.

Our own stakeholder engagement, and the research undertaken by the Address Data Working Group, indicates that poor address data is the cause of the majority of failed or delayed switches resulting from data issues. Most customers are unaware of their MPAN and MPRN, and as such address data is used as a proxy for identifying and switching meter points. Our quantitative sampling via stakeholders indicates that approximately 81% of data quality issues impacting switching are attributable to address data quality issues.

Currently, meter point address is most commonly used to identify meter points. Meter points for gas and electricity are separately mastered and owned by gas transporters and network operators respectively through their core metering systems. In addition, meter points may be located away from the supply premises (for example in blocks of flats).

As outlined above, the Data Model introduces the concepts of Premises and Premises Address. These are defined below:

Premises: *"The place for which energy is supplied by the energy supplier and is consumed by the energy consumer."*

Premises Address: *"The identifier of the Premises which may include house number, street name, town/city and other locational information."*

Use of the Premises Address means that customers will have a familiar identifier for their property to commence the switching journey, which enable identification of the property supplied. Its presence in the CRS means that this dataset will be mastered, owned and stewarded by the CRS Operator.

Using a single source of premises addresses will unify gas and electricity address data, and central stewardship of this data through the CRS will allow easier maintenance of high-quality address data. This, in turn, will decrease the incidence of delayed or failed switches.

The aim of the central address data solution will be to:

- Align premises address data for gas and electricity;
- Provide a single source of address data for the industry to match addresses to;
- Identify those addresses which are likely to require manual investigation to cleanse;
- Permit the Premises Address to act as an identifier of meter point; and
- Maintain ongoing address data quality.

Proposal

We propose that a Central Registration System (CRS) (if this is part of the Solution Architecture model chosen for the Switching programme) should host a central, single master database of Premises Addresses. This master database should be accessible to all parties as a lookup function and will enable all market participants to access a single, reliable source of address data. It may include additional functionality for unique property recognition (such as UPRN), but this will depend on the specification developed for the tender.

The Premises Address database held in the Switching Service would be accessible to all industry participants who are able to access the CRS (or the existing ECOES and DES

products)[9], including PCWs. A reliable address will be provided to the supplier or PCW, either by interfacing with the CRS through an API or by 'fuzzy matching'.[10] The correct address will be used to identify the correct MPAN or MPRN, which will then be used by the supplier to initiate the switch.

To achieve this, a comprehensive list of UK premises addresses would be procured by the CRS operator from a third party. This would require funding and a procurement process to be operated by the party responsible for the CRS.

For the purposes of switching, this master list of Premises Addresses would replace meter point data that is currently used by existing industry bodies to identify an MPAN or MPRN.

An initial matching exercise would be undertaken by the operator of the CRS, in order to match existing, distributed gas and electricity meter point address data (held GTs or DNOs, or contained within the existing industry datasets such as ECOES and DES/SCOGES) to the central address data set. This exercise would also identify, cleanse and validate those addresses within existing industry data which do not match to addresses within the procured dataset.

Matching would be performed by an automated algorithmic process in the first instance, and then unmatched or poor quality address data would be cleansed by manual processes. Our engagement with stakeholders indicates that an initial automated match rate of 80-85% success is realistic. The remainder of the addresses would be manually resolved until the dataset is considered adequately robust. It should be noted that the cost of this proposal will be driven to a large extent by the complexity and extent of this manual resolution process.

It is likely that some addresses will not be matched, and these would remain in the database as 'unqualified' addresses.

Unqualified Address: *"A Premises Address present in the CRS but has not been matched to an address in the master list. Therefore it has not been verified as a correct address."*

Procurement of the matching exercise should ensure that these 'unqualified' addresses are kept to a minimum.

Once this matching exercise is completed, this single address database would replace existing industry address datasets which are accessed via ECOES and DES.
Initial and ongoing procurement and maintenance of the master source of addresses would be undertaken by the operator of the CRS as data steward.[11]

Ongoing maintenance will entail:

- Ensuring the address listing is up to date, including managing the relationship with the address data provider to improve data as needed;
- Improving the stock of address data after the initial matching exercise (for example by updating and cleansing historic plot address data provided by GTs or DNOs);
- Matching new MPRN and MPAN data to addresses in the database; and
- Periodic cleansing of data as necessary.

[9] This will include PCWs, following implementation of the CMA's remedy.
[10] 'Fuzzy matching' is a technique used in machine learning to automatically match data sets.
[11] There are many numerous vendors for the address master reference. The acquisition of master reference data should be the subject of a formal RFI process.

In order to add new properties to the Property developers would still request an MPRN or MPAN from GTs or DNOs, as per the current process. We envisage two possible solutions for updating the central database with new property information.

1. When issuing the MPRN or MPAN, the DNO or GT would consult the Central Data Solution and either choose the correct address from there; or
2. An MPRN or MPAN and unqualified address would be submitted by the DNO or GT to the Central Address Solution, where the CRS operator would match it to an existing address on the database.

Of the options outlined above, 1) would appear to offer the lowest risk. It increases the likelihood that a 'correct' and consistent address is identified and included from the outset. Functionality of the database (and of the CRS) would need to reflect the need to populate new properties with meter point data.

It should be noted that the procurement of the address database is dependent on the chosen Solution Architecture featuring a central Switching Service. This remedy is consistent with Solution Architecture options 2 (centralised CRS) or 3 (centralised CRS and MIS), but would not be compatible with options 0 (do nothing) or 1 (do minimal).

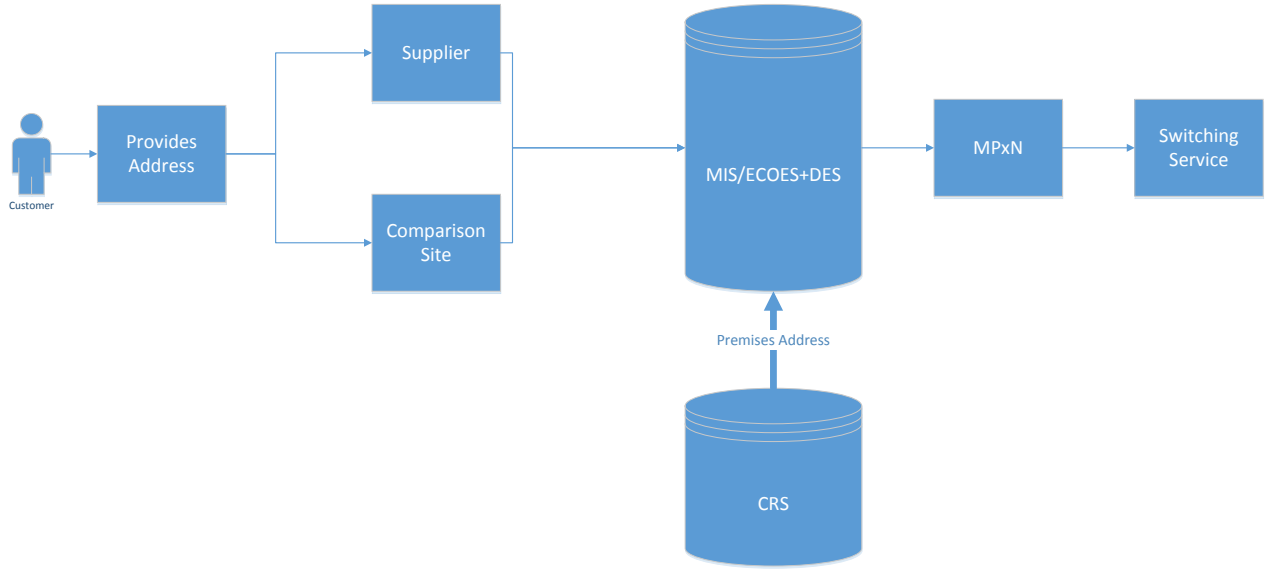

Figure 1: A Premises Address database within the Solution Architecture

Problems Addressed

We consider that the creation of a database of Premises Addresses would address the following problems:

Problem 1 – Unreliable Premises Address data

1. **Flats:** Flat addresses to be sourced from the master address list in order to remove inconsistent flat naming.
2. **Ambiguous Addresses:** The master address list would contain unambiguous addresses for each property so data matching will identify ambiguous addresses in industry data.
3. **Multiple meters at property:** All meters points at a property would be matched to one address, enabling multiple meters to be identified at point of sale.
4. **Dual Fuel Premises:** Similarly, gas and electricity meters would be aligned to Premises Address[5];

5. **Vanity or aliased addresses:** The master address list would contain the recognised correct Premises Address, and as such industry addresses would be cleansed against this. The central solution would contain aliases for such addresses.
6. **Incomplete Address:** Matching to a master address list would prevent incomplete addresses in the industry data as the master address list would contain complete addresses only.

Problem 3 – Prevalence of Plot Addresses in Industry Data.
A central address database could be used to eliminate plot addresses residing against a property where the full address is available via the local gazetteer. The operator would still have to seek the cooperation of the local authority and network operator to validate the plot to postal address mapping prior to updating the central solution.

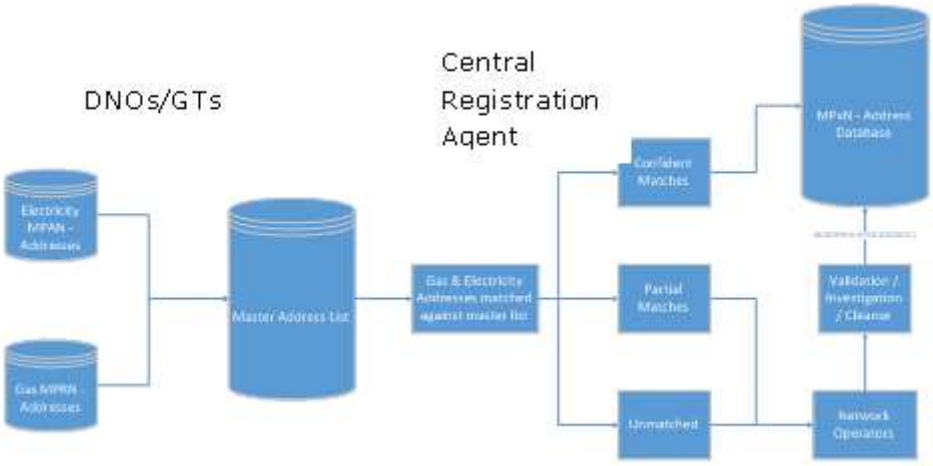

Figure 2 – implementing a central solution

Indicative Licensing Costs

As part of the remedy, the Premises Address database would form part of the initial specification of the CRS. The database, along with an initial data cleanse activity, would be procured from a third party provider at the same time as the establishment of the remainder of the CRS. **We welcome comments from stakeholders on how this might be achieved and what information will be necessary to understand in advance of development of the CRS.** Our stakeholder engagement has indicated that there are a number of providers of address listings and cleansing services who might offer such a service. Following initial procurement, the operator of the CRS would be responsible for maintaining an updated address listing and conducting further cleansing and maintenance of address data as required.

Procurement of a license would require that market participants, such as suppliers, would be able to access the database and match address data provided by their customers in order to affect switches. Our engagement with stakeholders has indicated that it may be feasible to acquire a group licence which allows all market participants to access the data whilst minimising additional cost.

We have obtained indicative cost data from providers of data services, based on a high-level specification of requirements as set out above. We have provided banded assessments of the cost of maintaining the database, set out below. This is provided merely as an indication of the likely scale of potential cost. Further analysis of cost will be required following the RFI, and a detailed assessment of how the database will be

procured will need to be compiled during the Switching Programme's Detailed Level Specification (DLS) phase.

Central Solution Cost Aspect	Estimated Cost
1. Ongoing/annual licencing costs for the data set	£200,000 – £230,000 per annum
2. The cost of an initial one-off reconciliation of existing industry data to Address Master Set.	£250,0000 - £600,000 once only
3. Cost of annual maintenance costs to include updates on a regular basis.	£200,000 - £300,000 per annum

Additional Project costs to be considered during the RFI for are tendering, systems management and infrastructure costs to design, test, implement, maintain and operate.

Initial assessment of costs and benefits of the remedy proposal

Our stakeholder engagement has suggested that the key possible benefits from a central address data solution are:

- An improvement in quality of address data held across the industry. This in turn would reduce the number of delayed and failed switches resulting from incorrect address data (estimated at approximately 81% of data-affected failed switches by respondents to our stakeholder engagement). This in turn would result in an improved experience of and increased customer confidence in the switching process;
- A consequential reduction in operational costs to the industry arising from reducing delayed and failed switches owing to addresses that do not correctly identify the right meter point at the customer's property; and
- An improved resource for address data, which could enable easier billing of consumers, depending on the design of the address database and the commercial agreement achieved with the supplier.

We would welcome views of interested parties into whether these benefits would be realised through the procurement of a central address database.

Procurement of an address database

A requirement to procure a central address database would be included as part of the specification for the Switching Service contained within the Central Registration System. This would be procured by the party responsible for the Central Registration System. The specification for the database, and a procurement process for acquisition of the address listing from a commercial third party, would need to be established at a later stage of the programme, following a decision on the chosen Solution Architecture for the programme.

We plan to invite comments on the feasibility and proportionality of this remedy as part of the Request for Information (RFI). This feedback will be used to form a decision on whether to proceed with the central address database remedy, and contribute to its design as part of the Detailed Level Specification (DLS) phase of the programme.

Evaluation

Our stakeholder engagement has indicated that improving the quality of address data would bring the single greatest benefit to making switching faster and more reliable. A centrally-held and managed resource providing a consistent and robust link between high-quality address data and both MPANs and MPRNs would significantly reduce the

volume of failed and delayed switches encountered by consumers, and create an aligned register of gas and electricity meter points.

Whilst similar proposals have been considered (and rejected) previously, most recently by the ADWG, the potential creation of a new Switching Service within the CRS creates an opportunity for a single resource, increasing the effectiveness of the data cleansing resource and reducing cost. Our stakeholder engagement has indicated that it may be possible to operate a database with a single or group licence, which would allow suppliers and other market participants to match their own data with that held in the central database. This would be essential to ensuring that costs of the remedy remain proportionate when compared to those considered by the ADWG, under which all market participants would have been required to purchase a license for any address solution implemented.

We invite stakeholders to:

- comment on their expectations of the expected reduction in rates of failed or delayed customer switches as a result of a single address solution which have not been identified by our initial stakeholder engagement,
- identify possible barriers to the operation of the successful operation of this remedy, and
- provide additional cost evidence where it is available.

Based on this further engagement, we will work to develop a detailed proposal for the design of a single address database in the Detailed Level Specification (DLS) phase of the programme.

4.2 Remedy 2: Improving Technical Meter Data

Our stakeholder engagement has indicated that meter technical information (and specifically meter time switch code and meter type) can have a significant impact on the switching process. If these data are not accurate in supplier data, customers may not receive the correct tariffs and services.

Proposal

An ongoing data reconciliation exercise should compare meter technical information held by meter operators and meter asset managers with that held by Suppliers.

Meter operators (MOPs) and meter asset managers (MAMs) do not operate under licence from Ofgem, but in effect are agents of supplier companies. In order for this remedy to be effective, suppliers would need to change their contracts with MOPs and MAMs to allow them to access and reconcile their data on asset meter time switch and meter type for all meter points on a regular basis. Incumbent suppliers would manage and be responsible for the process and perform any necessary reconciliation, comparing information supplied to them from MOPs and/or MAMs to the data held in ECOES and DES. Where a difference is identified, the incumbent supplier would be responsible for securing the correct data and ensuring that this is reflected in all industry data. This might involve direct contact with the customer, or physical verification of the meter type.

An effective reconciliation would require an initial cleanse of historic data, and the creation of a requirement to regularly reconcile technical information held by meter operators to that which is accessible from ECOES and DES data. This initial cleanse would be significant in scale and would potentially require suppliers to collectively

process up to 30 million data items. Following this, suppliers would have an ongoing requirement to maintain quality of meter technical data and ensure that mismatches were identified and corrected in industry data.

One possible way to deliver this would be to place a requirement upon suppliers to periodically report on meter technical data, and make these reports available to an appropriate party (for example Ofgem, or Xoserve or Gemserv in their capacity as operators of DES and ECOES, respectively). These reports would show changes in the number of meter points identified as having inconsistent meter data. By setting a timetable for reviewing meter type information and a requirement to produce evidence of such a review upon request of appropriate bodies, this remedy could create stronger incentives for suppliers to pursue and correct erroneous data.

It should be noted that Smart Meters are configured in such a way that allows a gaining supplier to use a service request to remotely access the meter's technical details, and that the meter can also be programmed to reflect different configurations which would require a different type of 'dumb' meter. For this reason, it is less likely that customers with Smart Meters would experience delays to switching. However, whilst this information will be accessible more readily from Smart Meters, it remains feasible that there may be mismatches between meter technical data held in industry systems and that held by suppliers. Whilst we envisage that this proposal would bring the greatest benefit to customers with legacy ('dumb') meters, it is possible that there may be some benefit from persisting with data reconciliation for Smart Meters.

Problems Addressed

Problem 2 – Poor Meter Technical Information.

Meter Time switch and Meter Type are used to validate a switch before the technical switching process takes place. If this data is incorrect, initial validation and the switch itself can be delayed. For example, a customer may be offered a contract which is not available to them due to meter type.

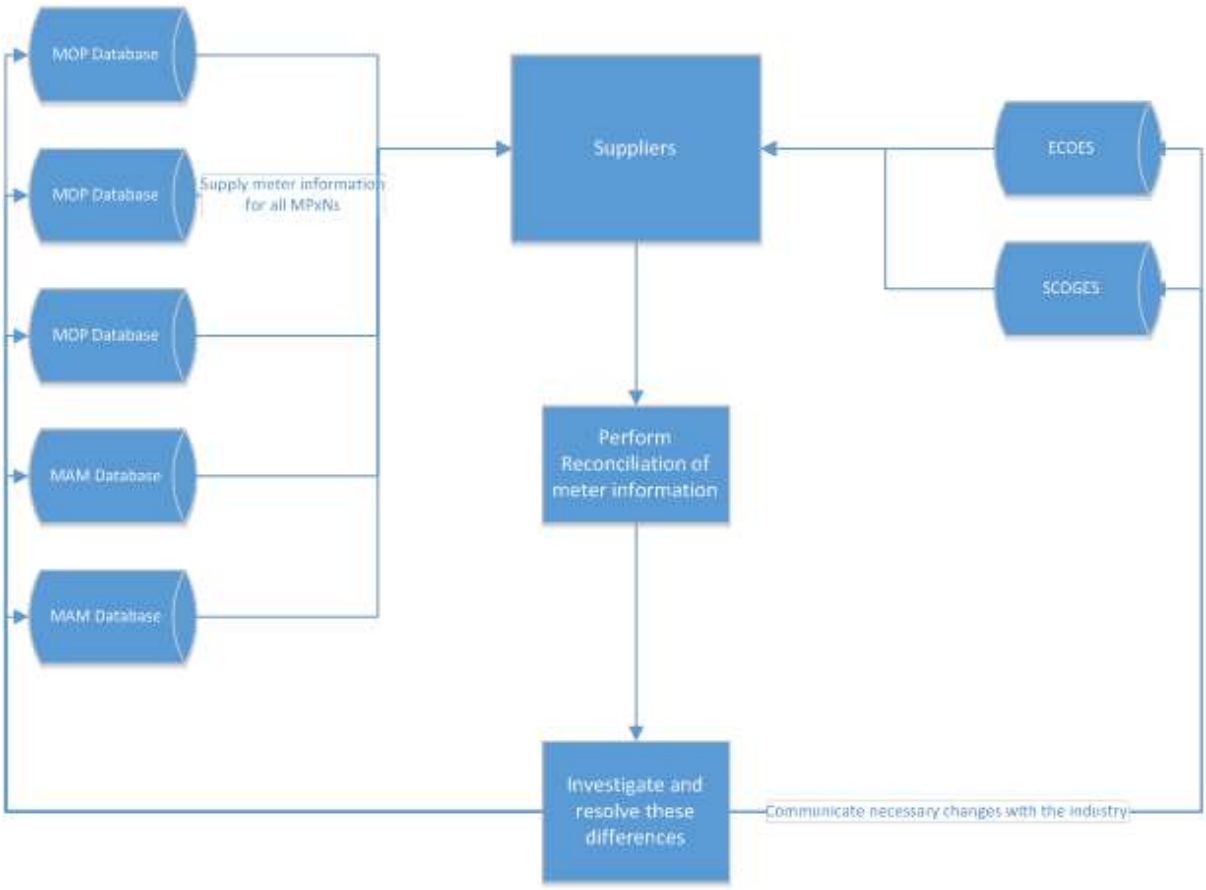

Figure 3 – Process for improving meter data

Required Code Changes

Whilst Meter operators are not directly licensed by Ofgem, they are impacted by a number of industry codes. Any change to codes to implement this measure must therefore be focused on mandating suppliers to access meter data held by MOPs and MAMs. This may involve changing the contractual position between supplier and the MOPs or MAMs whom they engage.

A code change to implement this measure would need to (in both the gas and electricity markets):

- Require suppliers to access and receive certain meter technical data (meter time switch and meter type) held by the MOPs and MAMs they engage;
- Introduce a requirement for suppliers to reconcile this meter technical data with that held on their own records and accessible via DES and ECOES on a periodic basis (for example every six months);
- Introduce a requirement for suppliers to make the results of any reconciliation exercise available to third parties with a genuine interest (such as Ofgem, Xoserve, or Gemserv);
- Establish penalties for suppliers who fail to perform these duties.

These code changes would aid in improving the quality of meter time switch code and meter type data which has been shown to impact switching. Therefore, this is important in helping the programme achieve its aim of faster and more reliable switching to increase competition between suppliers. If a decision is taken to move forward with this remedy then these code changes could be undertaken within the Significant Code Review which is supporting the programme.

Initial assessment of costs and benefits of the remedy proposal

Our stakeholder engagement has suggested that the benefits of an improvement in meter technical data would be:

- A reduction in the number of failed switches resulting from differences in meter type data (up to 14% of failed switches in our stakeholder engagement, or 2,100 switches per month), and also in delayed switches, resulting an improved experience of and increased customer confidence in the switching process;
- Reducing the risk of customers being billed according to the wrong tariff, reducing the occurrence of incorrect bills;
- A reduction in operational costs to the industry in identifying and remediating delayed and failed switches owing to incorrect meter time switch and meter type.

We intend to invite views of interested parties into whether these benefits would be realised through the implementation of the above measure through the Request for Information (RFI).

An initial qualitative assessment of some of the likely sources of cost for this remedy is set out below.

Activity	**Cost Type(s)**	**Potential absorption of Cost**
Secure Data Transfer between participants	Data Handling Resource	Supplier
Supplier infrastructure costs for storing, handling, retrieving and securely disposing of MOP/MAM datasets.	IS Hardware Data Management Resource	Supplier
Data management and reconciliation of meter data through existing data analysis toolsets	Data Analysis Resource	Supplier
Data anomaly management and remediation including liaison with Meter Operator	Data Analysis Resource	Supplier & MOP/MAM
Central Party with responsibility for collection and reporting of meter technical data reconciliation metrics	Central Reporting	Ofgem, Xoserve, Gemserv

Evaluation of Remedy 2

This remedy would introduce a requirement for suppliers to actively pursue and correct inconsistent and incorrect meter technical data. By introducing a formal requirement for suppliers to reconcile this data, we would introduce stronger incentives for them to maintain a higher quality of meter data on an ongoing basis.

Based on our current analysis and stakeholder engagement, we consider that a code change of the type set out above would be feasible to execute and proportionate. The code change is not dependent on any other part of the Switching Programme being executed. Our estimate based on switching data provided by stakeholders indicates that 2,100 switches per month may fail because of poor meter technical data, indicating that

there is a considerable benefit to be gained from remedying this issue, and the sooner that code changes to improve meter technical data are introduced, the greater the benefit will be to consumers and to the industry.

However, rollout of Smart Meters (which suppliers will be able to remotely interrogate and configure) means that the benefits from this remedy will be lessened over time, as the population of legacy ('dumb') meters becomes smaller. Whilst there are likely to be benefits from a general requirement for Smart Meters being correctly configured, responsibility for ensuring that this happens would appear to sit outside the Switching programme. Under the current timelines, Smart Meter rollout will be advanced by the time the new switching arrangements are established.

For this reason, we will ask respondents to the RFI to consider a number of factors:

- The degree of difficulty to be expected in designing and effecting the required changes the Industry Codes;
- The number of failed or delayed switches which can be directly attributed to erroneous meter technical data;
- The expected cost of the requirement on Suppliers to manage and execute the reconciliation and remediation activities; and
- The extent of any consumer benefits which may be yielded from this remedy being in place following Smart Meter rollout.

We will consider this information during the Detailed Level Specification (DLS) phase of the Switching Programme, as part of a decision about whether to proceed with this remedy. If a decision to proceed is made, we will develop a detailed proposal, including proposed changes to Industry Codes. In particular, we will consider that the expected benefit from this remedy is dependent on how early it is deployed in advance of Smart Meter rollout.

4.3 Remedy 3: Improving Plot to Postal Address Data

Approximately 1% of MPANs in the electricity industry data has no proper postal address and is instead represented by 'plot addresses'. A plot address is a premises where address is given as the plot number designated by the developer rather than a full postal address apportioned by a local authority and held in universal address data. In many cases such plot addresses have remained in industry data for many years.

Our stakeholder engagement has revealed that in the case of one major network operator, 31% of these MPANs were found to date from 2005 or earlier, and 6% date from prior to 2000. The problem is less prevalent across gas transporter (non iGT) data held by Xoserve, which shows approximately 0.1% of meters are linked to plot addresses. However, this is still approximately 26,000 gas meters.

Where a plot address is linked to an MPAN or MPRN, it may be difficult for a customer to effect a switch to another supplier using the postal address. This would directly lead to many of these MPANs or MPRNs having a delayed or failed switch.

There are two areas of significance in tackling the plot address issue; cleansing the current data set and preventing future issues. This proposal tackles both of these areas.

Proposal

Distribution Network Operators (DNOs) and Gas Transporters (GTs) should identify and cleanse plot addresses contained within their meter point address data, and communicate the results of this cleansing exercise to industry-held data sources. In addition, DNOs and GTs should periodically monitor and report upon plot addresses within the data that they hold.

This would be achieved by imposing responsibilities for reporting and monitoring the issue on the network operators and gas transporters.

We propose that this cleansing strategy is adopted if the central address solution as identified in Remedy 1 is also taken forward, as a reduced number of addresses to cleanse would not be an excessive burden. Central management of the GT Supply Point Register may have contributed to the relative low number of plot to postal issues in the gas industry, and once the Project Nexus is implemented the current stewardship will be extended to iGTs.

A central party with responsibility for collection and monitoring of aged plot data from DNOs and GTs to be contracted on behalf of Ofgem.

Initial Data Cleanse

For the initial cleanse of plot data, DNOs and GTs would be mandated to make best efforts (or reasonable endeavours) to identify and resolve plot addresses held against MPANs and MPRNs respectively. Postal addresses for an MPAN or MPRN could be located using any of the following methods:

- Contacting suppliers to provide meter point address data to the DNO/GT (who would need to ensure that this reflected the correct postal address);
- Using address data from a MOP or MAM, sourced via the supplier;
- Contacting the original property developer to identify postal addresses;
- Contacting the operator of a central address database (as envisaged in Remedy1, if available), and locating postal address data using an unique property identifier (if this is included within the chosen solution);
- Contacting the relevant local authority to identify mapping of postal addresses to development plots; and
- Engagement with the customer to resolve address issues, if appropriate.

DNOs and GTs would be responsible for ensuring that addresses sourced under this requirement were the most accurate available.

It should be noted that this remedy is independent of Remedy 1, which seeks to reconcile all addresses to a central listing of premises addresses. If Remedy 1 is implemented and the procured address solution is capable of identifying historic premises addresses, then that remedy would achieve the aims of this solution. However, this remedy may be implemented even if a central address solution (as envisaged by Remedy 1) is not, and its implementation would not be affected by the choice of the Solution Architecture underlining the Switching Solution.

Continuous monitoring of plot addresses

On an ongoing basis, DNOs and GTS would be periodically required to identify plot addresses held within their meter point data, and produce a report identifying the population of remaining plot addresses by age. This report may cover:

- The number of new MPANs/MPRNs issued in that period;
- The number of new plot addresses added to data in that period;
- The number of plot addresses removed from industry data in that period; and
- The overall proportion of the portfolio, banded by age of meter point of plot addresses.

Reports would be made available to code bodies and/or Ofgem on request. The proposal would allow GTs and DNOs to identify persistent or growing plot addresses, and would also allow code bodies or regulators to challenge GTs or DNOs experiencing growing numbers of plot addresses. However, it is recognised that in some instances the incidence of plot addresses may be beyond the control of DNOs and GTs, so in this instance an information remedy, backed with existing licence conditions and code requirements, is proportionate to address this risk.

Problem Addressed

Problem 3 – Prevalence of Plot Addresses in Industry Data.

Meter points attached to plot addresses within the industry data can be difficult to switch and can cause failures, delays and erroneous transfers. Customers may find it difficult or even impossible to switch if their property is recorded as a plot address in industry data.

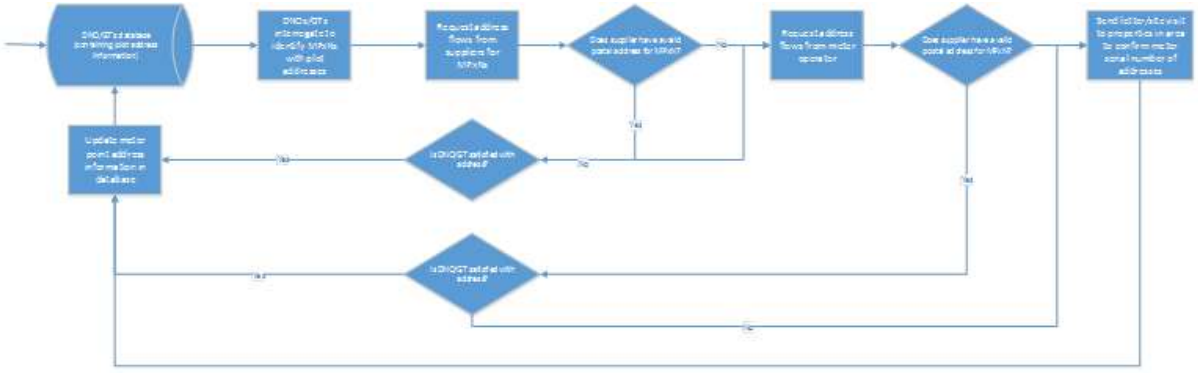

Figure 4 – process for cleansing plot addresses

Required Code Changes

Changes to Industry Codes would be required to create a mandate for network operators to search and resolve plot address details, to mandate sharing of plot address information between suppliers and GTs/DNOs as appropriate, and in order to require DNOs and GTs to produce reports identifying the number of plot addresses in the data that they hold.

Similarly, code or licence changes may be required to introduce regulatory incentives for GTs or DNOs to address long-standing issues with plot addresses. Alternatively, existing licence conditions may be adequate to incentivise GTs or DNOs as appropriate. Legal advice and further policy development within the Switching Programme should be required to assess the most effective means of implementing these measures.

Initial assessment of costs and benefits of the remedy proposal

Based on our stakeholder engagement, we estimate that there is a population of between 200,000 to 300,000 Electricity MPANs and 20,000 Gas MPRNs which may be

represented by plot addresses in industry data, and that these numbers may grow if no action is taken to address the issue. We consider that the benefits of the remedial action outlined above might be:

- A decrease in the number of lost or delayed switches amongst the population of customers indicated above, leading to a better customer experience of the switching process and increased confidence in the switching;
- A reduction in operational costs to the industry arising from lost or delayed switches;
- An improved understanding across industry of issues arising from plot address data, and how to resolve them.

Activity	Cost Type(s)	Potential absorption of Cost
Identification and resolution of aged plot addresses	Data Analysis Resource	DNO/GT
Meter Point Address data provisioning	Data Analysis Resource	Suppliers & MOPs/MAMs
Data anomaly management and validation with Suppliers, network operators and including liaison with Customer where necessary	Data Analysis Resource	DNO/GT
Monitoring of aged plot metrics	Central Reporting	Code bodies

We will invite views of interested parties into whether these benefits would be realised through the cleansing of Plot to Postal information, and whether our qualitative assessment of likely costs is reasonable through the Request for Information (The above benefits should be further explored and assessed in the RFI).

Evaluation of Remedy 3

This aim of this remedy is to reduce the historic population of plot addresses in industry data and maintain the ongoing population of plot addresses at as low a level as possible. Almost all stakeholders contacted in our initial engagement raised this as a significant problem.

We do not consider that the process of resolving historic plot addresses should be technically complex. In our view, the majority of time and resource required would be taken up by the validation and manual investigation to be performed by the network operators. However, some work may need to be undertaken to ensure the legal and regulatory infrastructure underpinning the transfer of data between suppliers, MOPs and MAMs and GTs and DNOs, and also incentivising GTs and DNOs to ensure that any ongoing solution is delivered fairly and minimizes any unintentional consequences.

Whilst this proposal does not have direct dependencies on the other proposals set out in this document or on the progress of other aspects of the Switching Programme, the reconciliation of historic plot data may well be progressed as part of the initial Data Cleanse exercise contained within Remedy 1, depending on the procured address solution. If these remedies are progressed as part of the same package, the cost of this remedy would be reduced. Identification of residual plot addresses in advance of procurement of an address database could also reduce the burden on the initial data cleanse exercise as part of Remedy 1.

As above, we will consider information submitted in support of and regarding this proposal in the Detailed Level Specification (DLS) phase of the Switching Programme, as part of a decision about whether to proceed with this remedy. If a decision to proceed is

made, we will develop a detailed proposal, including proposed changes to Industry Codes.

4.4 Remedy 4: Enhance Responsibilities on Smart Meter Installers

As part of the ongoing Smart Meter rollout, there is an opportunity to use installers' site visits to identify address data quality issues that required manual intervention.

Proposal

The Switching Programme should identify whether Smart Meter installers' site visits can be used to resolve residual data cleanse issues that are not possible to resolve using the other remedies as part of this package (such as the Central Address Solution).

Between now and 2020, it is the government's intention that Smart Meters will be rolled out to all domestic properties, and as such almost all affected properties will be visited by a meter installer. Legacy ('dumb') meters will be replaced by Smart Meters and each metered property will have a display device installed in the premises served (which may be physically separate from the meter location). This rollout offers an opportunity for physical verification of meter information, including the address of the premises served.

Under this remedy, suppliers, GTs and DNOs, or the body responsible for maintaining a central address data solution, would identify a residual population of properties which could not be confirmed to an adequate degree by other data cleansing efforts. These properties would be provided to suppliers, or a party responsible for installing meters on behalf of suppliers, who would physically verify the premises address at the point of installation of the display device. This could allow confirmation of address data against MPAN or MPRNs. Information from this physical verification would be reported back to the operator of a central address solution and/or GTs or DNOs, who would accept the new address or seek to resolve any further discrepancies. This information could be relayed either from a designated verification exercise conducted at installation, or by using data from suppliers' own attempts to identify and install smart meter transmitting devices.

It is our view that this remedy would complement other remedies proposed (including a possible central address solution), by facilitating cleansing of addresses that have otherwise proved too complex to match using other routes.

Assessment/Monitoring:

An initial evaluation could be carried, perhaps using a pilot approach. Based on the success of the pilot (e.g. how many meter points issues have been identified and resolved by installers) the trial could be extended to the wider roll-out of Smart Meters.

Assuming a wider roll-out, further monitoring of the levels of inconsistencies should be performed by suppliers as part of the resolution of address discrepancies.

Problems Addressed

As indicated previously, approximately 81% of the issues we identified though our engagement arose as a result of mis-alignment between addresses and MPANs or MPRNs. Our stakeholder engagement conveyed a consistent message that a residual population of meter point addresses that cannot be mechanistically matched to a Premises Address. Implementing this remedy in tandem with other remedies will address **Problem 1 – Unreliable Premises Address data** for those properties which are unable to be cleansed automatically for whatever reason.

Required Code Changes:

Smart Meter roll-out is scheduled to occur independently of the Switching Programme or of any Data Cleanse activity. This proposal would place an additional requirement on suppliers in addition to those which are already set out or under development in suppliers' roll-out plans, and in particular might impact suppliers' legally binding roll-out targets. Changes to industry codes would be required to stipulate the additional roles apportioned to Smart Meter installers. A possible vehicle for this would be through mandated changes to SMICoP or equivalent.

In addition, installers and suppliers must be physically prepared for verification activity (most likely through software changes to installation handsets), and responsible for the verification for ensuring that remedial information is passed in a timely manner to the network operators for direct remediation of Premises Address. This responsibility may require further code changes.

Initial assessment of costs and benefits of the remedy proposal

Benefits (and costs) of this activity taken in isolation would largely depend on the size of the residual population of addresses which cannot be verified with an appropriate degree of confidence by other means. However, benefits might include:

- An increase in the quality of industry-wide address to meter point alignment, reducing the customer experience of delayed and failed switches and increasing customer confidence in the switching arrangements;
- Reduction in the need for an independent site visits or customer engagement; and
- A reduction in operational costs to the industry arising from delayed and failed switches.

Respondents to our programme of stakeholder engagement have indicated that physical verification of a premises address would take minutes. This indicates that the marginal cost of each site visit will potentially be limited, although this could still imply a significant cost if multiplied over several thousand or even several million properties. For this reason, it is recommended that this activity only be undertaken after other methods of cleansing data (including the central address solution, if implemented) have been adopted and the size of the residual population of uncleansed addresses is minimised. However, this remedy would require some fixed costs (such as the cost of implementing code changes and of configuring software for Smart Meter Installer personal units, which should be considered when assessing the utility of this remedy. However, the timing of the activity will also affect its utility; it is possible that some properties will already have Smart Meters installed before a residual population of uncleansed data can be identified.

Activity	Cost Type(s)	Potential absorption of Cost
Cost of configuring Smart Meter Installer personal units with address verification software	Work Order Management of Smart Meter installer	Switching Programme/Supplier
Articulation and provisioning of meter points that require manual intervention to installers	Central Data Stewardship Team	Switching Programme
Cost per visit of one address to have required meter point data verified followed by the installer feeding back information	Work Order Management of Smart Meter installer	Supplier
Pilot exercise to gauge efficiency of proposal	Smart Meter installer	Supplier
Central Data Stewardship Remediation following site	Central Data Stewardship Team	Switching Programme

intervention feedback		

We will encourage respondents to the RfI to consider the above assessment of costs and benefits, in addition to the challenges of ensuring that this remedy is effective.

Evaluation of Remedy 4

Physical verification of meter data is perhaps the most reliable method of ensuring data is clean, and the Smart Metering programme presents an opportunity to use a scheduled programme of site visits to verify address data, and therefore not to incur additional cost. In particular, this presents an opportunity to clean 'problem addresses', which might otherwise sit uncleansed in industry data for some time.

However, to manually check all meter points, even as part of the Smart Meter rollout, would be likely to be prohibitively costly, and therefore this remedy is dependent on the timing and success of other remedies (including Remedy 1, the proposed Central Address Solution), in addition to the timing of the Smart Meter programme. However, if timed properly, this remedy may present the only means of resolving some stubborn address data problems.

Should the process be successful, the network operators will be provided with a population of meter points which require remediation. The network operator may have information on the issue and this will make investigating the address of these meter points quicker and more focused than through other parties.

We will invite respondents to articulate:

- The likely marginal cost of address verification as part of smart meter rollout;
- The feasibility of timetabling this proposal alongside Smart Meter rollout;
- Any insight which can be offered on the likely population of address data which will prove resistant to other forms of data cleanse, and therefore will be in scope for this remedy.

We will consider this information, and any other submitted in support of and regarding this proposal in the Detailed Level Specification (DLS) phase of the Switching Programme, and liaise with those involved in smart meter rollout in order to reach a decision about whether to proceed with this remedy. If a decision to proceed is made, we will develop a detailed proposal for delivery.

5. Actions for EDAG

We intend to further test the options developed in this paper. Where appropriate, we will consider how to develop this strategy for Data Improvement by seeking industry views in the RfI. This in turn will be influenced by other decisions about the remainder of the Switching Programme which are made at this stage or later in the programme (for example, concerning the Solution Architecture or Data Model.

Any proposals which are carried forward following consideration of views of respondents to the RfI will be further developed at the Detailed Level Specification (DLS) phase of the programme. In the case of some of the remedies proposed, code changes will be drafted and implemented as soon as is reasonable.

We would welcome any engagement from stakeholders which would assist in understanding these problems and in developing the cost-benefit case for the remedy options discussed.

In particular, we would like the Group to consider for each remedy:

- Are these remedies feasible to execute?
- If so, what would be the most effective means of implementation (for example via the SCR or other means)?
- What additional information is necessary to make a decision on whether to proceed with the remedy?
- Are the expected benefits of the remedies likely to be delivered?
- Are there any additional costs that we have failed to anticipate?

We will consider feedback from the EDAG in taking our work on Data Improvement forward.

6. Annexes

6.1 Annex I - Quantification

Further to the outcomes of our rich stakeholder engagement, we articulate below the most significant problems occurring in the switching process which result from issues with data. We then ascribe possible root causes which may result in these issues. Also included, where available, is quantification of the problem gathered via our stakeholder engagement. Ranges of quantification indicate varying evidence from our different engagement.

Data Issue	Problems Caused	Evidence	Recommendations
Poor Address and Meter Point Alignment	Meter Point and Address Alignment issues – attributable to the majority (c81%) of address data quality issues: • Difficulty identifying meter points due to no match (or ambiguous match) between customer address and industry data; • Erroneous transfers due to ambiguous addresses	From our stakeholder engagement, address data quality issues, account for c.81% of switching issues according to samples obtained, and statistics reported. A price comparison website was able to tell us that 8% of customer failed to locate their address when attempting to switch. An individual supplier quoted that 75% of all registration rejections were due to address data. Of address issues, where sufficient detail was available, the below approximate percentage breakdown was attained from our sampling. • Flats/Conversions (including things such as houses containing '21A' in address) (c.67%) – one supplier quoted a lower figure of 24% of issues being related to flats. This has not been taken into account by the 67% due to lack of other available breakdown made available by supplier concerned. • Crossed meters (c.9%). • Named Properties (e.g. farms and vanity addresses) (c.5%) • Gas and Electricity Address different (c.4%) (This was only highlighted by one of our stakeholders, but made up 22% of that sample). • Plot Addresses (c.8%). • Incorrect Postcode (c.3%). • Multiple Meter Points	• Enduring Central address solution with central, ongoing stewardship of address data. • Responsibilities placed on Smart Meter engineers.

Data Issue	Problems Caused	Evidence	Recommendations
		registered to same address (c.4%). • Related Meters at address (c.1%). • Other ambiguous address (c.1%). *Note that the total adds up to greater than 100% due to some switches having multiple issues	
Poor Meter Technical Information	Inconsistent or incorrect meter technical information – through our stakeholder engagement to date, approximately 14% of the sample of switches we have so far are affected by meter technical data. • A significant cause of switching issues is the quality of meter technical information; The major aspect of this is when a customer chooses a service or tariff for which the meter technical information in industry data states they are not suitable.	• c14% of switching issues are caused by meter technical information according to sampling obtained; • Significant variation in results of various sources, with one sample containing 46% of switches affected by data being impacted by meter technical data. This is likely due to differences in processes – the primary reason why this data causes delays is due to suppliers performing validation on tariffs and services prior to switching; • It is not possible to identify how many of these are due to customer choice, and how many are due to poor data quality; • One engagement was able to inform us that approximately 3% of switches were affected by the customer providing incorrect information. • Stakeholder engagement has indicated that a cause of poor meter information data is the process of meter data passing from meter operators to the industry data.	• Meter technical information reconciliation and cleanse.
Poor Plot to Postal data	Plot to Postal Address Updates – Our investigations indicate c1% of meter points contain a plot address. This is based on information from one very large network operator. Current evidence consists of some analysis provided to us by some network operators. It has become apparent that this issue is less	• Anecdotally identified by almost all stakeholders engaged. • Volume of plot addresses assigned to active meters varies by operator; with the largest sample of data obtained from a major operator showing 1% of meter points with plot addresses. • Approximately 0.1% of gas meter points associated to plot addresses, indicating this problem is less significant in the gas industry (according to	• Improve plot to postal data and process for maintaining it

Data Issue	Problems Caused	Evidence	Recommendations
	prevalent in the gas industry. • Time taken for plot addresses to be resolved leads to new meter points being unable to be switched for a significant period of time; • High number of meter points associated with a plot address which dates back a number of years. These are difficult to switch, but also the most difficult meter points to cleanse.	statistics regarding by large GTs supplied by Xoserve) • Volume of plot addresses was as high as 10% of portfolio in some sampling of independent operators. • Caused approximately 8% of address issues with switches based on our sample.	
Crossed Meters (Problem 4)	• Erroneous transfers caused due to MPAN and MPRNs being registered to the wrong address.	• While conclusive evidence of crossed meters is not always available in our investigations, our sampling indicated that approximately 9% of switches which were impacted by data were caused by crossed metering. • Of a small specific sample of erroneous transfers, 20% of these were caused by crossed meters.	• Process enhancement for issuing MPAN and MPRNs.

6.2 Annex 2 - Summary of Remedies

Below is a summary of the Remedies outlined in this section, assessed against the programme's design principles.

Design Principle	Option 1: Holistic solution; with address data held and managed centrally.	Option 2:Improving Meter Data	Remedy 3:Improving Plot to Postal Address Data	Remedy 4: Responsibilities on Smart Meter Installers	Remedy 5:Improving Process of Issuing MPAN and MPRNs (withdrawn following discussion at User Group)
1 Reliability for customers	Improved reliability for customers due to reduction in address data quality issues as a result of matching process and central stewardship of data.	Improved reliability in the service that is available to customers. Fewer instances of incorrect tariffs being offered.	Plot addresses being resolved reduces likelihood of an ET due to wrong MPAN or MPRN being selected (using a plot address which may be unreliable)	The intended outcome of this recommendation would be overall improved data quality facilitated by on site investigation. Therefore improved reliable expected.	Reduction in errors relating to crossed meters. This will reduce number of crossed meters going forward and therefore increase reliability for those customers who would be affected.
2 Speed for customers	Delays caused by address data quality issues today should be reduced, thus increasing speed of switching.	Switches should no longer be delayed by customers being offered the incorrect tariff (unless they provide incorrect information), so the delay this causes should be removed.	Reduces delays caused by inability to match an address provided to a plot address in order to determine MPAN or MPRN.	General improvement in address data quality expected to lead to few instances of delays in switching.	No impact on speed.
3 Customer Coverage	All customers covered	No effect on coverage.	Those customers currently with 'plot addresses' in industry data will be able to use address to identify.	No effect on coverage.	No impact on coverage.
4 Switching Experience	Process will be as usual for customer, as per decided solution architecture; but for reduction in follow up work needed by customer to resolve switching issues caused by address data.	The customers should experience fewer instances of incorrect tariffs being offered, and fewer instances of work being required to establish the correct meter type, and repeat the quotation process.	Delay caused by plot addresses removed; less chance of ETs for affected customers; less chance of manual work required of customer to identify meter point.	Improved experience expected due to reduced numbers of delays, failures and extra work caused by poor address data quality.	Vastly improved switching experience for those customers who would otherwise be affected by crossed meters and erroneously switched.
5 Competition	Ease of switching should be increased for some customers due to reduction of data quality issues.	No impact on ability to actually switch, but reduction in issues which may cause customers to balk from switching.	Increased likelihood of a customer (with a current plot address) switching from their current supplier.	Increase in number of customers with good address data quality means more customers will be able to easily switch suppliers.	No effect on competition.

Design Principle	Option 1: Holistic solution; with address data held and managed centrally.	Option 2:Improving Meter Data	Remedy 3:Improving Plot to Postal Address Data	Remedy 4: Responsibilities on Smart Meter Installers	Remedy 5:Improving Process of Issuing MPAN and MPRNs (withdrawn following discussion at User Group)
6 Design – robustness	Central design is the same, and the management of all addresses centrally allows for consistent processes.	No impact on design.	No impact on design. New process in place.	No impact on design.	No impact on design.
7 Design – flexibility	Highly flexible; the data could be compiled and cleansed ahead of central implementation and then 'slotted in' to desired data model.	No impact on design.	No impact on design.	No impact on design.	No impact on design.
8 Solution cost/benefit	Reduced cost compared to network operator managed solution due to central costs and dedicated team. By cleansing centrally in advance of migration, the complexity of the migration event itself will be reduced via increased likelihood of compliant data being successfully migrated first time. Also potential license cost benefit.	Low cost to identify those meter points with inconsistent meter data. High, but proportional, cost for investigation.	Almost all of cost taken up by investigation which must be carried out to determine correct addresses. Costs are proportional to volume of plot addresses in a party's data.	Despite the limited scope of the obligations placed on the meter fitting, there will likely be some increase in costs due to increase in time taken.	Low cost. This solution relies on code changes and small changes to industry parties' processes.

Design Principle	Option 1: Holistic solution; with address data held and managed centrally.	Option 2:Improving Meter Data	Remedy 3:Improving Plot to Postal Address Data	Remedy 4: Responsibilities on Smart Meter Installers	Remedy 5:Improving Process of Issuing MPAN and MPRNs (withdrawn following discussion at User Group)
9 Implementation	Relatively straightforward; implementation can begin once the Central Registration Agent is secured; and can be incorporated into any selected data model (be it CRS or ECOES/DES). Does rely on process to be set up to continually receive data from network operators while matching is done prior to go-live.	No implementation.	Implementation is that of a process which must be implemented by individual operators to investigate their own plot addresses.	No implementation.	Implementation of processes should be simple, and can be left up to individual parties (network operators, suppliers, developers).

Annex 3 - Remedy 5:Improving Process of Issuing MPAN and MPRNs

Remedy 5 was discussed at User Group, where it was identified that further work should be undertaken on understanding the process of issuing MPANs and MPRNs, and how this might affect commercial relationships between suppliers and their customers. For this reason we have decided not to proceed with this remedy at this stage. However, we consider that it or a variant may be implemented independently of the development of the CRS and/or the Switching programme.

Crossed meters and MPAN and MPRNs in the industry data which may have not been assigned to a meter point have been identified as a reason for erroneous transfers. Approximately 20% of erroneous transfers for which an explanation is given are due to crossed meters.[12] A common source of crossed meters is in new-build developments.

At present, property developers request MPANs and MPRNs from DNOs and GTs to connect gas and electricity supply to a new property. A list of MPANs and/or MPRNs may be issued to a development before any individual premises is even built. Developers' plans can be subject to change, and therefore MPANs and MPRNs may be recorded as being issued to a different property to that originally intended.

Proposal

Under this remedy, an obligation would be placed upon **DNOs and GTs to refrain from issuing MPAN and MPRNs to developers until there is a scheduled fitting date for the specific meter point to which the MPAN or MPRN will be assigned. Assignment should be not more than two weeks prior to the scheduled fit date.**

DNOs and GTs would refrain from issuing MPAN and MPRNs until they have the fitting of the physical meter point arranged, and no more than two weeks prior to this date. DNOs and GTs would be required to retain records showing timings of physical fitting of meter points and issuance of MPANs or MPRNs for audit by code bodies or the regulator if necessary.

This measure would not prevent the occurrence of crossed meters, but by reducing the potential for an extended interval between MPAN or MPRN issuance, it becomes easier for DNOs and GTs and developers to maintain accurate records of which MPAN or MPRN is applied to which property, whilst reflecting commercial imperatives of developers and network operators.

As with other remedies, this measure is not dependent on the implementation of any new Solution Architecture as part of the Switching Programme. The measure could be implemented as soon as possible in order to bring immediate benefits.

Problem Addressed

Problem 4 – Crossed Meters. Crossed meters occur when an MPAN or MPRN is assigned to an incorrect meter point, and this is not addressed in industry data. This can mean that one premises is billed for another's supply. This remedy is intended to reduce the occurrence of crossed meters but is unlikely to eliminate it entirely.

Benefits

[12] This figure was reported to Ofgem from our stakeholder engagement.

This remedy would not eliminate the occurrence of crossed meters, but would potentially reduce their incidence. Ensuring that MPANs and MPRNs are correctly apportioned to potential meter points depends upon co-ordination with developers, suppliers and other parties, not all of whom are subject to industry codes or regulation.

A reduction in the incidence of crossed meters would bring a clear benefit to consumers through reducing the incidence of erroneous transfers, therefore improving the customer experience of the switching process, and would also bring a saving to industry by reducing the time and resource utilised in identifying and resolving erroneous transfers. However, it is difficult to predict exactly to what extent this measure would reduce incidence of erroneous transfers.

However, we expect that the majority of cost imposed on parties as a result of the implementation of this measure would be the opportunity cost from rearranging contractual arrangements and changes to the timing of installation.

Activity	**Cost Type(s)**	**Potential absorption of Cost**
Refraining from issuing of MPAN or MPRN to Housing Developer	Operational	Opportunity Cost to DNO/GT, suppliers and customers (developers)
Recording of evidence of issuance of MPANs and MPRNs alongside meter installation dates	Data Analysis Resource	DNOs/GTs (recording), Code bodies/Ofgem (audit)

The potential benefits and costs of this remedy, including any potential unforeseen consequences of implementation, should be further explored and assessed in the RfI.

Required Code Changes:

Changes may be required to Network Codes requiring that GTs and DNOs do not issue MPAN and MPRNs for new locations until a set interval prior to an appointment to physically install the meter point is made.

Ofgem has powers to deliver changes to industry codes under its Significant Code Review (SCR). The scope of the SCR in relation to the Switching Programme may be summarised as "the arrangements required to deliver reliable next-day switching for consumers on a new CRS which is procured by the DCC". We consider that by improving address data, these code changes intended to facilitate faster and more reliable switching. In considering the appropriateness of these changes following the RfI, we will consider whether these changes may be made under Ofgem's SCR powers.

Evaluation

This remedy would not remove the risk of crossed meters arising from installations in new-build properties. However, it is possible that it would lead to fewer instances of MPAN and MPRNs being recorded against the incorrect meter point address in the network operator's database, which in turn would lead to fewer crossed meters.

However, the remedy may have unintended consequences which are difficult to establish in advance of implementation. In particular, it may require independent gas transporters (iGTs) and independent Distribution Network Operators (iDNOs) to revise their procedures for attributing MPAN and MPRNs installing meter points. It may also affect the commercial relationship that DNOs/GTs and suppliers have with developers.

As part of the RfI, we intend to invite comments on the efficacy of this remedy from;

- GTs, DNOs, and iGTs, and iDNOs, on the impact that this proposal would have on business plans and relationships with stakeholders;
- Suppliers, on the difficulty that this remedy may cause on connecting supply to new-build properties;
- Any stakeholder on potential unintended consequences arising from this proposal; and
- Any stakeholder, on the specification of a proposal (for example, the time span which should be allowed between issuance of the MPAN or MPRN and installation of the meter point).

We will consider this information, and any other submitted in support of and regarding this proposal in the Detailed Level Specification (DLS) phase of the Switching Programme, as part of a decision about whether to proceed with this remedy. If a decision to proceed is made, we will develop a detailed proposal, including proposed changes to Industry Codes.