

PUBLIC

Design Working Group

Appendix A - Draft Target Operating Models: TOM Development process



ELEXON

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DESIGN WORKING GROUP

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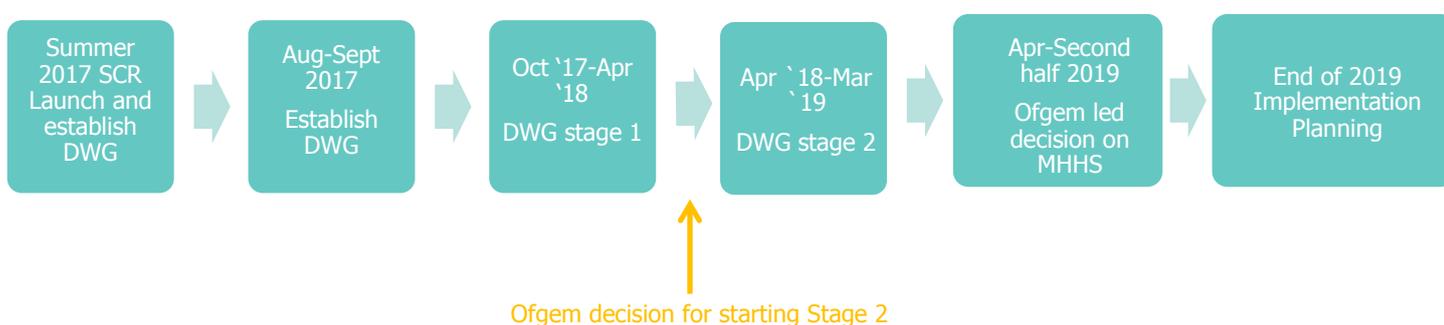
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INTRODUCTION

This paper sets out the Target Operating Models (TOMs) development process. This work is being undertaken by the ELEXON led Design Working Group (DWG) that is supporting the Ofgem led Significant Code Review (SCR) on Market-wide Half-Hourly Settlement (MHHS).

This paper sets out the DWG approach to development of the TOMs and the rationale for the approach undertaken in TOM development. This paper is presented in report format, as it will form the basis for the final report for Ofgem on Phase 1 of the SCR process.

The detailed timeline for the project can be found in the Ofgem SCR Launch Statement [Appendix 1](#). The high level timetable for this project is as follows:



This document covers the key discussions and agreements of four meetings of the DWG (see [ELEXON website DWG](#) for further details on the meetings). It sets out the TOM baseline principles agreed by the DWG and used to develop the TOM service groupings and then the draft TOMs. Some of the terminology has been developed by the DWG as the meetings have progressed so note different terms have been used and this will be made consistent in the final report to Ofgem.

1. What is a Target Operating Model (TOM) for MHHS?

A TOM for MHHS is a set of services and processes required to deliver Settlement Period (SP) level data from a Meter to a central Settlement body to enable the calculation of the amount of energy a Suppliers customers have consumed for each Settlement Day (SD). This calculation is then used in the Imbalance Settlement process which compares the Suppliers contracted purchases of energy to the amounts deemed to have been consumed (sales) by each Supplier's customers. In optimising the TOMs there will be consideration of the additional benefits that can be realised by having access to such data: for example, for smart grid development, innovation or flexibility offerings. Additionally, it is intended that the TOMs will allow for Settlement timescales to be reduced to provide further benefits (e.g. reduction in credit cover).

2. What is the Objective for Stage 1 of the DWG work

Stage 1 of the DWG work is to develop several potential TOMs (Skeleton TOMs) for the end state when most customers will have a Meter capable of delivering SP level data for Settlement purposes. These TOMs will be evaluated to identify the TOM which best meets the [Design Principles](#) set out by Ofgem.

The evaluated TOMs will then feed into an industry wide consultation which will seek to identify any further detail that can be fed into the evaluations of the optimum TOM.

Stage 1 will not seek to consider the low level detailed processes. For example, such as how data is validated, or how data is estimated when data is missing or invalid. Detailed design will be considered as part of DWG Stage 2.

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Additionally Stage 2 will deliver detailed transitional arrangements to the TOMs. This will be consulted on as part of Stage 2.

3. What are the high level steps in the TOM development process for Stage 1

The high level steps as follows and progress so far is set out in this document:

- Step 1:** Define all the processes that are required to deliver MHHS;
- Step 2:** Group the defined process in to high level activities;
- Step 3:** Identify the high level type of Service required to deliver the high level activities;
- Step 4:** Identify ways in which Services could be grouped for delivery by a Market Role;
- Step 5:** Define a set of TOMs that can be evaluated; and
- Step 6:** Evaluate each TOM against the Evaluation Criteria and Design Principles.

The evaluated TOMs will be the final deliverable for Ofgem for DWG Stage 1. It will also be used for the consultation in Stage 2.

4. Strawman TOMs: Initial presentation to the DWG

As part of the preliminary TOM development work, ELEXON developed a number of strawman TOMs for illustration purposes and discussion by the DWG. An example strawman for a TOM with a 'smart agent' role (covers both NHH and HH settlement processes) is shown below in Figure 1.

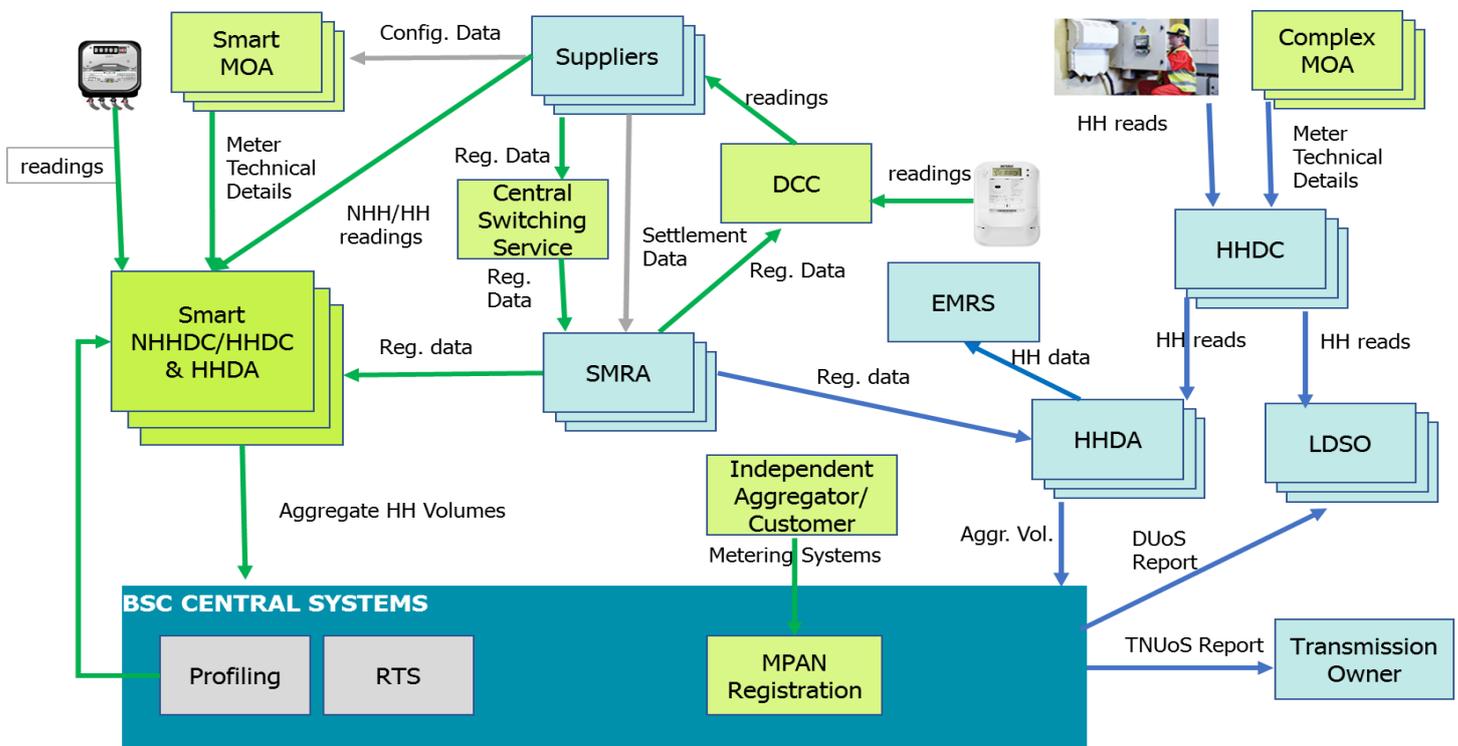


Figure 1: Example Strawman TOM

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DWG DEVELOPMENT OF THE TOMS PROCESS

5. DWG Meeting 1, 11 October 2017

At the first meeting ELEXON presented the Terms of Reference for the DWG and the [Design Principles](#) set out by Ofgem in Appendix 2 of the SCR Launch Statement. ELEXON also presented a number of working documents for use by the DWG in the TOM development.

ELEXON presented an initial set of five strawmen TOMs for illustration and discussion. The DWG noted a separate TOM has been developed for unmetered supplies. The draft strawmen and descriptions can be found in Attachment A to this paper.

The DWG discussed the strawmen TOMs. The DWG decided to take a step back and start from first principles when designing the TOM and it was agreed that the way to do this would be done through a 'use case' model for each of the five market segments:

- a) Smart meter with Settlement Period (HH) data available;
- b) Smart meter without HH data available;
- c) non-smart meter without HH capability;
- d) traditional HH (advanced meters); and
- e) unmetered supplies.

These categories cover all Meter and data combinations that exist in the current arrangements that any TOM will need to accommodate. The DWG also agreed some amendments to the [Settlement Roles and Responsibilities](#) document that mapped existing processes to current roles.

The DWG asked ELEXON to present a 'use case' approach, starting from a first principles approach to identify the draft viable strawman TOMs with the DWG.

Following the first meeting ELEXON set out the key processes grouped by activity classification for each of the market segments such that the use cases for each could be assessed.

Key to Process Map

The following colour key has been used for the existing process map:



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The process map for each sector can be seen in Figure 2 below.

Smart HH Metering	Smart NHH Metering	Non-Smart NHH	Traditional HH
Meter Installation	Meter Installation	Meter Installation	Meter Installation
Meter Maintenance	Meter Maintenance	Meter Maintenance	Meter Maintenance
	Meter Configuration	Meter Configuration	Meter Configuration
Meter Fault Investigation	Meter Fault Investigation	Meter Fault Investigation	Meter Fault investigation
Meter Registration	Meter Registration	Meter Registration	Meter Registration
Meter Registration Service	Meter Registration Service	Meter Registration Service	Meter Registration Service
Calculation/ Provision of LLFs			
Retrieval of HH Data			Retrieval of HH Data
	Retrieval of NHH Meter Readings	Retrieval of NHH Meter Readings	
Validation of HH Data			Validation of HH Data
	Validation of NHH Meter Readings	Validation of NHH Meter Readings	
Exception Reporting	Exception Reporting	Exception Reporting	Exception Reporting
Exception Handling	Exception Handling	Exception Handling	Exception Handling
Estimation and defaulting	Estimation and defaulting	Estimation and defaulting	Estimation and defaulting
	Estimation of hh consumption	Estimation of hh consumption	
Calculation of UMS Volumes			
Aggregation of HH data by Supplier/ GSPG for Settlement	Aggregation of hh data by Supplier/ GSPG for Settlement	Aggregation of hh data by Supplier/ GSPG for Settlement	Aggregation of hh data by Supplier/ GSPG for Settlement
Aggregation of HH data for Flexibility			Aggregation of HH data for Flexibility
Aggregation of HH data for DUoS			
Aggregation of HH data for TNUoS			
Aggregation of HH data for Other			
Application of LLFs	Application of LLFs	Application of LLFs	Application of LLFs
Calculation of Supplier Deemed Takes			
Calculation of GSP Group Takes			
Application of GSPG Correction			
Settlement Reporting Activities			
Maintenance of Standing Data and Parameters			

Figure 2: MHHS process mapping by market segment

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6. DWG Meeting 2, 15 November 2017

At the second meeting, ELEXON presented a number of potential services that could deliver the processes set out in Figure 2. Generic terminology was introduced for these services (so they do not get confused with existing BSC services, current agent roles and service providers):

Key	
"Market Service"	
"Supplier"	
"Registration Service"	
"Metering Service"	
"Data Processing Service"	
"Aggregation Service"	
"Volume Allocation Service"	
"Standing Data Service"	
"Distribution Losses Service"	
"Load Shape Service"	

ELEXON presented options for mapping these Services to the market activities defined for smart Meters with Settlement Period (SP) data. The DWG agreed the potential mappings of the Services to activities, see Figure 3 below:

Registration Activities	Responsible Party						
Meter Registration							
Appoint Supplier Services							
Provide Registration Service							
Maintenance of Standing Data							
Calculation/ Provision of LLFs							

Metering Activities	Responsible Party						
Meter Installation							
Meter Maintenance							
Remote Meter Configuration							
On-Site Meter Configuration							
Meter Fault Investigation							

Data Retrieval Activities	Responsible Party						
Retrieval of Register Readings							
Retrieval of Period Data							

Data Processing Activities	Responsible Party						
Validation of Data							
Exception Reporting							
Exception Handling							
Estimation and Substitution							
Conversion to 'HH-Derived' Consumption							

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Aggregation Activities	Responsible Party						
Settlement Exception Reporting							
Aggregation of HH data for Settlement							
Aggregation of HH data for Flexibility							
Aggregation of HH data for DUoS							
Aggregation of HH data for TNUoS							
Aggregation of HH data for Other							
Application of LLFs							

Volume Allocation Activities	Responsible Party						
Calculation of Supplier Deemed Take							
Calculation of GSP Group Takes							
Application of GSPG Correction							
Settlement Reporting Activities							
Maintenance of Standing Data							

Figure 3: Potential mappings of the MHHS Services to activities

DWG Group workshop on 'Use Case' for other Meters by data collection method

The DWG split into three subgroups and each subgroup identified the optionality for process activities within each of the other segments. ELEXON presented the findings of the workshops. The DWG noted that some activities had single 'Use Case' such as Registration and Metering Services, i.e. there was only a single service or service combination that could deliver these Services. It was noted that there was commonality of optionality for process activities between the 'Smart Meter Settlement Period' segment and the 'Smart Meter with Register Reads' segment because the Meter was the same in both sectors. The DWG agreed that the differentiation was mainly around the following activities:

- data retrieval;
- data processing; and
- data aggregation activities.

Use Case: collation and DWG walkthrough

ELEXON collated the workshopped activities and presented them back to the DWG. The key findings were that the mappings of some market services to activities were common to all segments (Registration, Metering and Volume Allocation). The DWG discussed standing data requirements in context of Meter registration data or other standing data that would be required for Settlement purposes. It was agreed it meant standing data for registration was 'data that was required in relation to a metering point'.

The DWG discussed potential groupings of data processing activities noting that sub-processes such as validation and estimation varied by sector, noting that these would be discussed in detail as part of Stage 2. The output from the workshop can be seen in Figure 4 below.

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Activity	"Smart SP-Level"	"Smart RR-Level"	"Non-Smart RR"	"Advanced SP"	Unique Use Cases
Registration Activities					
Meter Registration	Supplier	Supplier	Supplier	Supplier	1
Appoint Supplier Services	Supplier	Supplier	Supplier	Supplier	1
Provide Registration Service	Registration Service	Registration Service	Registration Service	Registration Service	1
Maintenance of Registration Data	Registration Service	Registration Service	Registration Service	Registration Service	1
Maintenance of Reference Data	SDS	SDS	SDS	SDS	1
Calculation/ Provision of LLFs	DLS / SDS	DLS / SDS	DLS / SDS	DLS / SDS	1
Metering Activities					
Meter Installation	Metering Service	Metering Service	Metering Service	Metering Service	1
Meter Maintenance	Metering Service	Metering Service	Metering Service	Metering Service	1
Maintain Meter Asset Data	MS / RS	MS / RS	MS / RS	MS / RS	1
Remote Meter Configuration	N/A	Supplier	N/A	Metering Service	2
Commissioning, Proving and Maintenance	Metering Service	Metering Service	Metering Service	Metering Service	1
On-Site Meter Configuration	N/A	N/A	Metering Service	Metering Service	1
Meter Fault Investigation	Metering Service	Metering Service	Metering Service	Metering Service	1
Data Retrieval Activities					
Retrieval of Register Readings	N/A	Supplier / Data Service	Supplier / Data Service	N/A	1
Retrieval of Period Data	Supplier / Data Service	N/A	N/A	Data Service	2
Data Processing Activities					
Validation of Data	Data Service	Data Service	Data Service	Data Service	2
Exception Reporting	Data Service	Data Service	Data Service	Data Service	2
Exception Handling	Supplier / Data Service	1			
Estimation and Substitution	Data Service	Data Service	Data Service	Data Service	1
Conversion to 'HH-Derived' Consumption	N/A	Data Service, LSS	Data Service, LSS	Data Service, LSS	1
Aggregation Activities					
Settlement Exception Reporting	Aggregation Service	Aggregation Service	Aggregation Service	Aggregation Service	1
Aggregation of HH data for Settlement	Aggregation Service	Aggregation Service	Aggregation Service	Aggregation Service	1
Aggregation of HH data for Flexibility	Aggregation Service	Limited?	Limited?	Aggregation Service	2
Aggregation of HH data for DUoS	Aggregation Service	Aggregation Service	Aggregation Service	Aggregation Service	1
Aggregation of HH data for TNUoS	Aggregation Service	Aggregation Service	Aggregation Service	Aggregation Service	1
Aggregation of HH data for Other	Aggregation Service	Aggregation Service	Aggregation Service	Aggregation Service	1
Application of LLFs	Aggregation Service	Aggregation Service	Aggregation Service	Aggregation Service	1
Supplier Volume Allocation					
Calculation of Supplier Deemed Take	Volume Allocation Service	Volume Allocation Service	Volume Allocation Service	Volume Allocation Service	1
Calculation of GSP Group Takes	Volume Allocation Service	Volume Allocation Service	Volume Allocation Service	Volume Allocation Service	1
Application of GSPG Correction	Volume Allocation Service	Volume Allocation Service	Volume Allocation Service	Volume Allocation Service	1
Settlement Reporting Activities	Volume Allocation Service	Volume Allocation Service	Volume Allocation Service	Volume Allocation Service	1
Provision of Load Shape Services	LSS	LSS	LSS	LSS	1

Figure 4: DWG Workshop mapping MHHS Services to Activities

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7. DWG Meeting 3, 13 December 2017

TOM Baseline Principles: Foundation for development

ELEXON proposed a number of 'agreements in principle' for the DWG to use in the TOM development. This helped the DWG consider how services could be grouped and to discount certain options (e.g. the retention of existing NHH processes). The DWG agreed the proposed agreements in principle with a few amendments. The baseline principles, agreed by the DWG, are that the Market-wide Half-Hourly Settlement (MHHS) TOMs will:

1. be optimised for the longer term 'target state' where the majority of Meters will be Smart or Advanced. Any Meter not either of these should be managed as part of the transitional arrangements;
2. only consider as transitional states (and not the final TOM option) any designs that use the existing Elective HH and Non Half Hourly (NHH) settlement arrangements;
3. cover HH meter data (Active Import and Active Export) for Settlement purposes only. While non-settlement activities (such as billing) are out of scope, the design will aim not to be detrimental to these;
4. aim to design out elements of the existing Non-Half Hourly (NHH) profiling process such as the use of Annualised Advances (AAs) and EACs (EACs);
5. aim to have at least one TOM aligning with the policy developments for data privacy and consideration of agent functions;
6. not consider technology or architecture factors at this stage;
7. consider any new Unmetered Supplies arrangements only once a framework is in place for the metered segments of the market so as not to constrain the possibilities for the TOM design; and
8. not consider Settlement timescales until TOM options have been further developed.

The DWG then agreed the following approach to be taken at the meeting to develop the TOM options for Service Groupings. This is best illustrated by the following example showing the journey from Settlement Processes to Service Groupings (see Figure 5 below):

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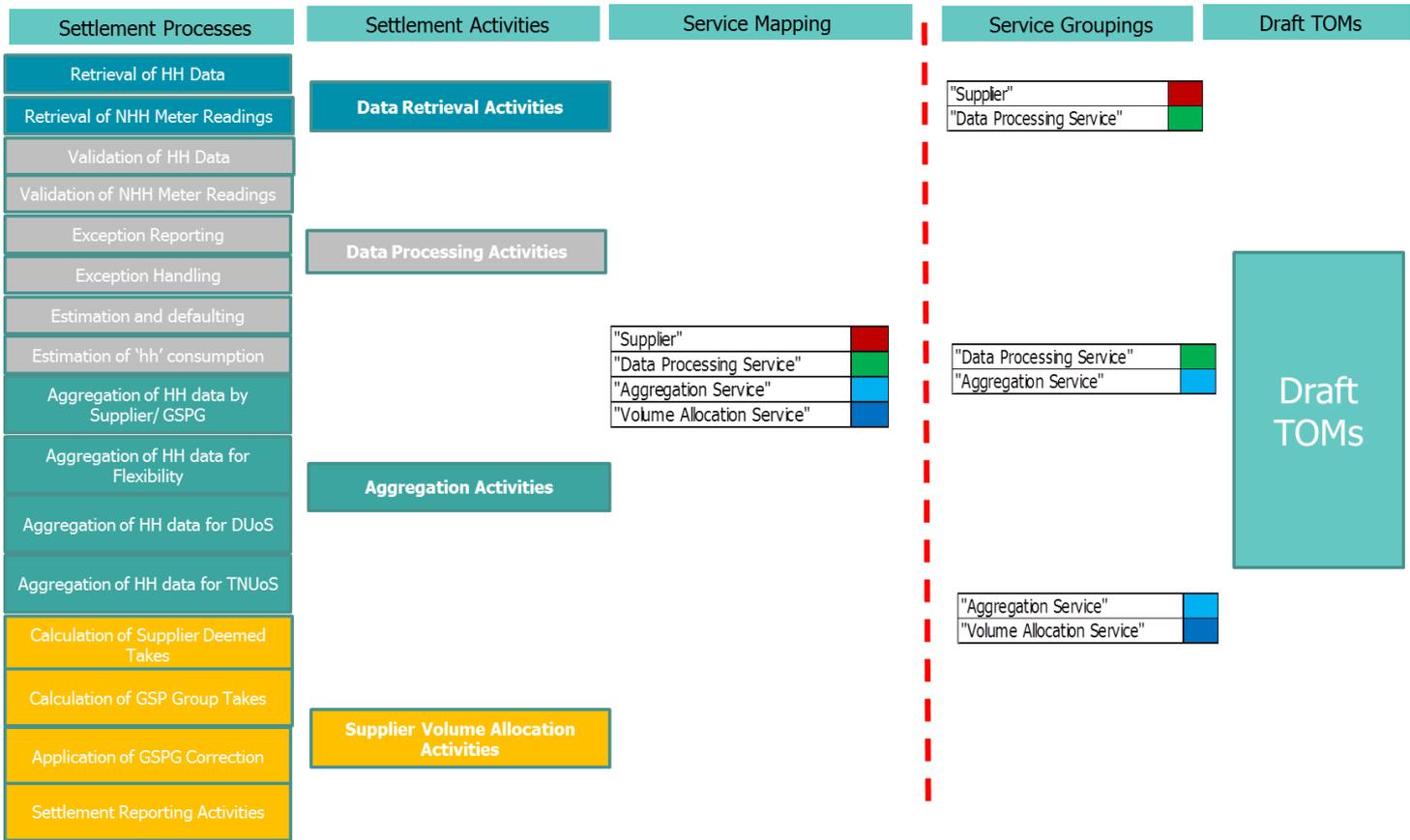


Figure 5: MHH Settlement Processes to Service Groupings

TOM Options: Service Groupings

The service mapping exercise provided an insight into which activities were likely to be provided by a single service 'type'. For example, all metering activities could be provided by a Metering Service rather than a combination of Services. Services with single use cases or ones that needed other services to be defined first were not considered in development of the Service Groupings.

These included:

"Registration Service"	Yellow
"Metering Service"	Yellow
"Distribution Losses Service"	Dark Blue
"Unmetered Supplies Service"	Purple
"Standing Data Service"	Orange
"Load Shaping Service"	Black

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The DWG were asked to define the options for grouping Services for Meter-to-Bank (M2B) for each of the segments based on a matrix setting out the process activities from retrieval to volume allocation. ELEXON presented the following example matrix to the DWG can be seen in Figure 6 below.

M2B 4x4	Retrieval Service	Processing Service	Aggregation Service	Volume Allocation Service
Smart Meter (whole current, DCC serviced)	Retrieve Period Data	Validate period data Correct errors replace missing data	Report exceptions Produce HH aggregation files Send Settlement Reports	Get GSPG metering Calculate deemed takes Apply losses and corrections Send reports
Smart Meter (whole current, DCC serviced)	Retrieve Register Readings	Validate readings Get load shape data Derive period data	Report exceptions Produce HH aggregation files Send Settlement Reports	Get GSPG metering Calculate deemed takes Apply losses and corrections Send reports
Advanced Meter (CT)	Retrieve Period Data	Validate period data Correct errors replace missing data	Report exceptions Produce HH aggregation files Send Settlement Reports	Get GSPG metering Calculate deemed takes Apply losses and corrections Send reports
Non-Smart NHH Meter	Visually Read Meter Registers	Validate readings Get load shape data Derive period data	Report exceptions Produce HH aggregation files Send Settlement Reports	Get GSPG metering Calculate deemed takes Apply losses and corrections Send reports

Figure 6: Example Meter-to-Bank process Service Grouping

DWG considerations when identifying where Services can be grouped

At the third DWG meeting the DWG considered the service groupings to construct the draft TOMs. This section provides a summary of these considerations.

The DWG started from the basis that the Services from the earlier activity mapping exercise would be separately defined so that market participants would have maximum freedom in how these might be organised and delivered.

In considering a TOM with four separately defined Services (Retrieval, Processing, Aggregation and Volume Allocation) the DWG noted that Aggregation (as currently defined) in the traditional HH (Advanced) market is an extension of Processing and therefore there was less justification for maintaining this as a separate service. Any defined Aggregation Service would best sit across the whole HHS market, with MPAN level meter data as input.

The DWG also approached the Advanced HH market segment with the principle that any change from the current baseline would largely be driven by the design choices taken in the Smart Meter segment. That is, the DWG felt that there was little reason for changing the process to address any obvious defects. However, the DWG noted that the

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existing split of HHDC and HHDA into separate roles was not necessary for the MHHS TOMs. Previously, the NHH arrangements required this split because NHHDCs use common ELEXON-provided software and therefore there is a clearly defined interface between NHHDCs and NHHDCAs. Furthermore, in some cases NHHDCAs hold data for more than one NHHDC for the same settlement dates. As the new TOMs propose to dispense with EACs and AAs, the Aggregation service will largely be a summation across the MPAN portfolio held by the Data Processing service in a set of defined categories.

For the centralised option (TOM E), the DWG noted that a single 'Retrieval to Volume Allocation' service was possible for Smart Meters, but that this option had less clear benefits from the Advanced HH market where competitive Data Processing services already exist. Therefore, any TOM based on a centralised model would need to integrate the Advanced segment in a way that left the existing 'Retrieval + Processing' services intact. Such a TOM would then need to use common market-wide Aggregation and Volume Allocation for both segments.

When considering services across market segments the DWG felt that, even though some services like Processing could look very similar for 'Smart with SP data' and Advanced Meters, it was safer to leave these as separate services until the detailed requirements for each service became clearer. For TOMs which combined Retrieval and Processing, this automatically separated the Smart and Advanced segments as the rules for retrieving settlement data from meters was almost certain to differ due to the former using the DCC.

When considering which of the separately developed Advanced Meter TOMs would fit best with the Smart Meter ones, the DWG chose only those which were consistent with the service grouping decisions taken for the latter. Consequently there is typically only one Advanced TOM that is compatible with each Smart Meter TOM as the others apply fundamentally different groupings or definitions of services that do not align with those for Smart meters.

The following section depicts the high level TOMs in diagrammatical form developed at the third DWG meeting. These include the service grouping diagrams together with commentaries and a business process model depiction for each TOM.

8. DWG Meeting 4, 10 January 2018

DWG consideration and agreement on Draft TOMs focussing on Data Retrieval, Data Processing and Data Aggregation

The DWG meeting 4 objective was to confirm the position reached at the last DWG and to finalise the draft Target Operating Models (TOMs). The draft TOMs would then be provided to Ofgem (for DAB comment and use in the design policy work) and the next steps would be the evaluation of the TOMs.

At meeting 4, ELEXON set out the five 'worked up' TOMs agreed at meeting 3 (that focussed on Data Retrieval, Data Processing and Data Aggregation services and smart and advanced meters only). The DWG worked through the each 'worked up' TOM clarifying the DWG understanding of each TOM. The DWG agreed that services would be defined as competitively procured or centrally procured. The DWG agreed that centrally procured Services could be single or multiple monopolies. ELEXON agreed to add this into the TOM diagrams using additional boxes or shadows to identify the optionality for each service.

The DWG set out the pros and cons of each TOM. ELEXON agreed to write up the agreed pros and cons when drafting the draft skeleton TOMs for evaluation document which will be delivered to Ofgem and copied to the DWG.

The DWG considered and agreed the following 'worked up' TOMs. The DWG also agreed that the previous sections of this document was an accurate reflection of the considerations to date of the DWG in the development of the draft TOMs.

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TOM A: Combined Retrieval and Processing with Market Wide Aggregation

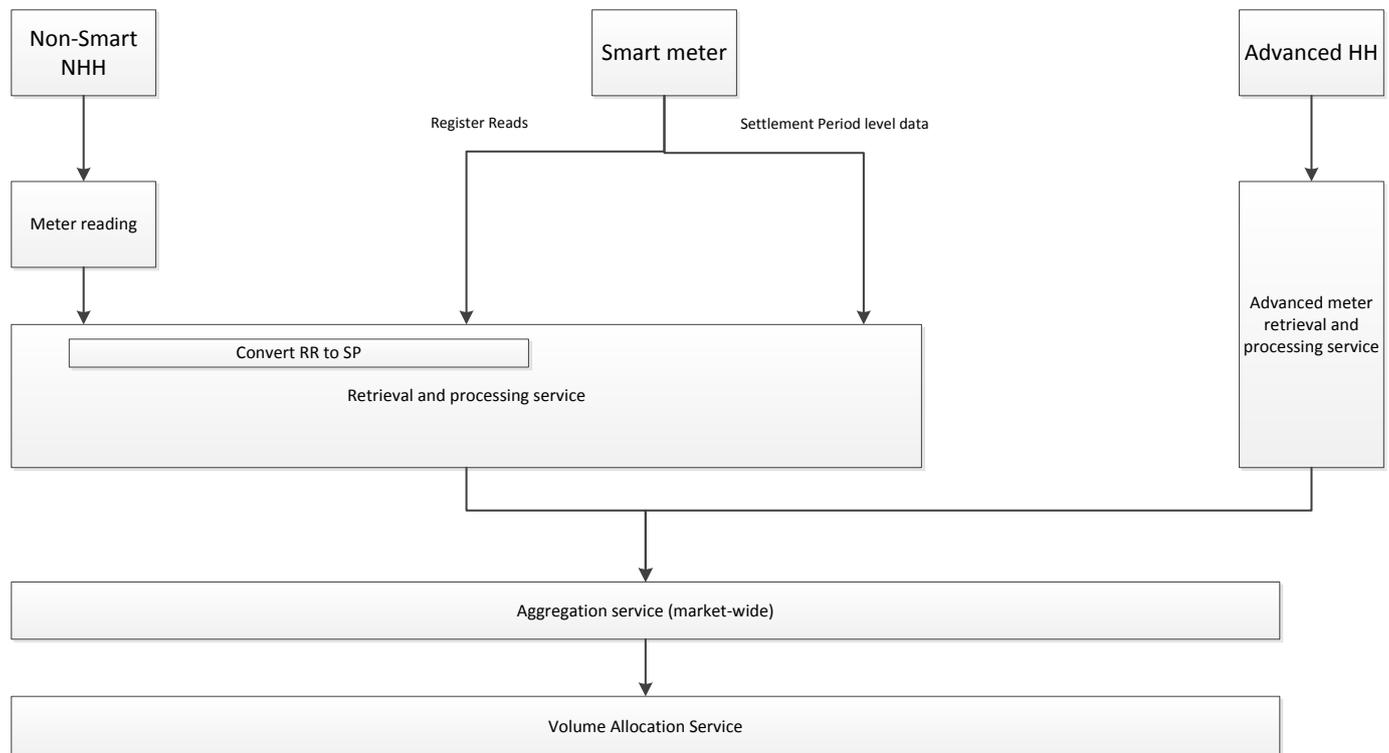
M2B TOM A	Retrieval Service	Processing Service	Aggregation Service	Volume Allocation Service
Smart Meter with HH data	Smart Meter Retrieval and Processing Service		Aggregation Service (Market Wide)	Volume Allocation Service
Smart Meter without HH data				
Advanced Meter TOM I	Advanced Meter Retrieval and Processing Service			

DWG discussion on TOM A

- The basis of this TOM is that Retrieval and Processing are bundled into a single service, one for Smart and one for Advanced, reflecting the different ways of communicating with these meters. The Smart service will also apply conversion where SP-level data is not available before outputting SP-level data to a market wide Aggregator, who will sum up the data across the whole market before feeding aggregated volumes to a single Volume Allocation Service.
- While much of the Processing of SP-level data is likely to be similar between the Smart and Advanced meter segments, these are also defined separately because of the need to convert register reads into SP-level data for SMETS Meters (e.g. for opt out customers) which is not required for Advanced.
- This TOM means would mean a minor change to the existing HH market, as the Data Aggregation function at a Supplier level would no longer be the route into settlement. However, the Retrieval/Processing service will still be able to provide aggregated volume reports to Suppliers for non-Settlement purposes such as billing reconciliation.
- The DWG also noted that a variant on this service grouping could be where retrieving and processing Smart meters without SP-level data is separated out as a distinct service, leaving Smart with SP-level data closely aligned with Advanced. The conversion of Register Reading data into Settlement Period level data is likely to be a relatively small, distinct subset of Smart Meter Processing, and so the DWG felt that it may not require defining this as a wholly separate Service.

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TOM A: Business process model: Combined Retrieval and Processing with Market Wide Aggregation



Features:

- A single aggregation Service (subject to Ofgem policy decisions) means all the SP-level data would be aggregated centrally, thus facilitating independent aggregators (demand-side response), peer-to-peer, system operation by DNOs, data for network charging.
- The significant difference from the status quo is the centralisation of the aggregation Service. All other functions could easily be performed by existing providers.

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TOM B: Combined Processing and Aggregation with Retrieval as a separate Service

M2B TOM B	Retrieval Service	Processing Service	Aggregation Service	Volume Allocation Service
Smart Meter with HH data	Smart Meter Retrieval Service	Smart Meter Processing and Aggregation Service		Volume Allocation Service
Smart Meter without HH data				
Advanced Meter TOM II	Advanced Meter Retrieval, Processing and Aggregation Service			

DWG discussion on TOM B

The basis of this TOM is that Processing and Aggregation are bundled into a single Service for Smart Meters, with retrieval of readings via the DCC being separated out to allow more flexibility in who might deliver that service.

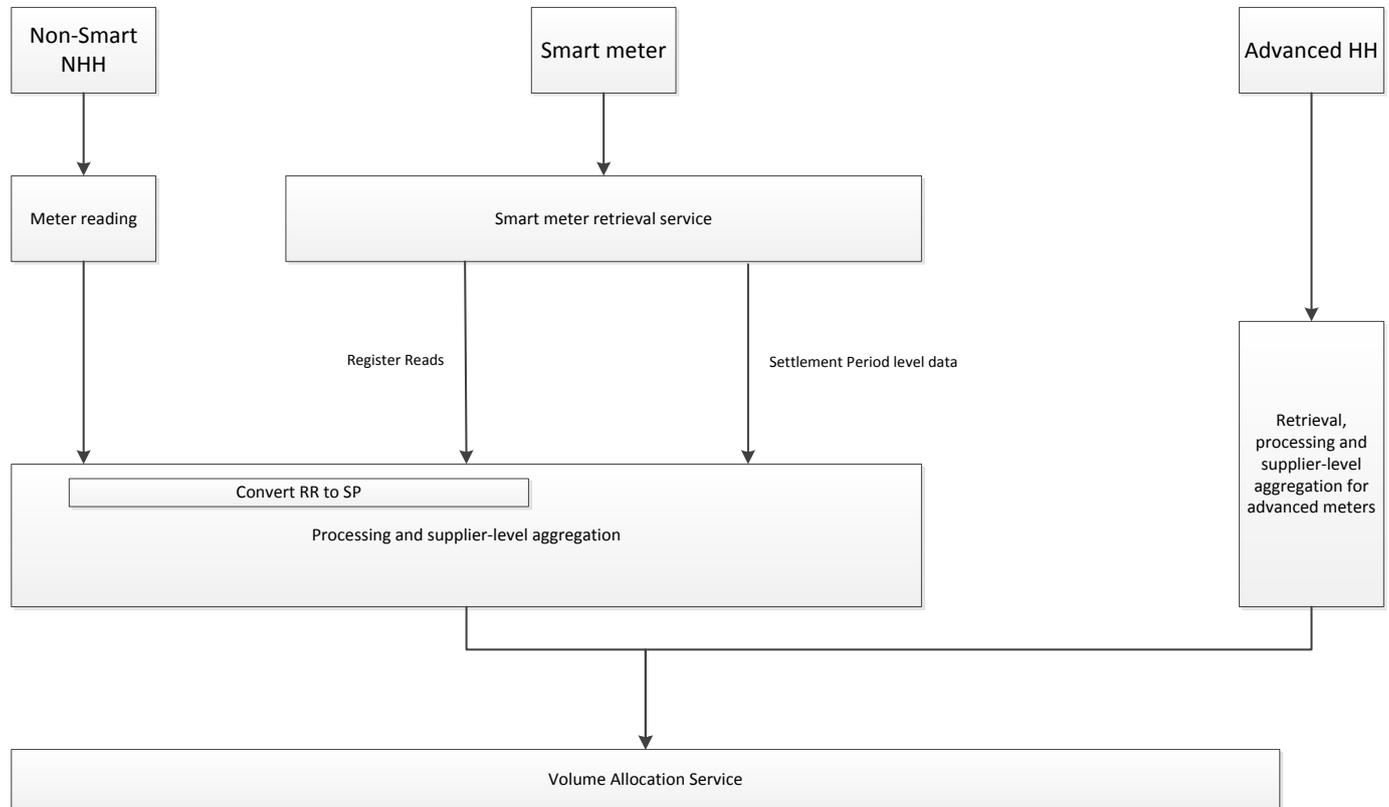
With Aggregation done as part of Processing, it means that with multiple Processing Services operating the data will be aggregated first before reaching the Volume Allocation Service which covers the whole market. That would mean that there is no single market wide view of MPAN-level data should it be required for demand-side response or other activities that require access to this data. To mitigate this, a separate view of market-wide MPAN level data would have to be obtained or accessed from all the Processing services operating in the market.

As with TOM A, the Smart Processing and Aggregation Service will apply conversion where SP-level data is not available but in this TOM will aggregate data for the Volume Allocation service. Advanced metering is left more or less as the status quo, but with collection and aggregation combined.

This TOM could also be varied to split the service that processes register readings from the one that does SP-level data.

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TOM B: Business process model: Combined Processing and Aggregation with Retrieval as a separate Service



Features:

- Volume Allocation Service is procured centrally.
- No significant differences in market structure from the status quo hence functions could easily be performed by existing providers.

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TOM C: E2E Service covering Retrieval through to Aggregation

M2B TOM C	Retrieval Service	Processing Service	Aggregation Service	Volume Allocation Service
Smart Meter with HH data	Smart Meter Retrieval, Processing and Aggregation Service			Volume Allocation Service
Smart Meter without HH data				
Advanced Meter TOM II	Advanced Meter Retrieval, Processing and Aggregation Service			

DWG discussion on TOM C

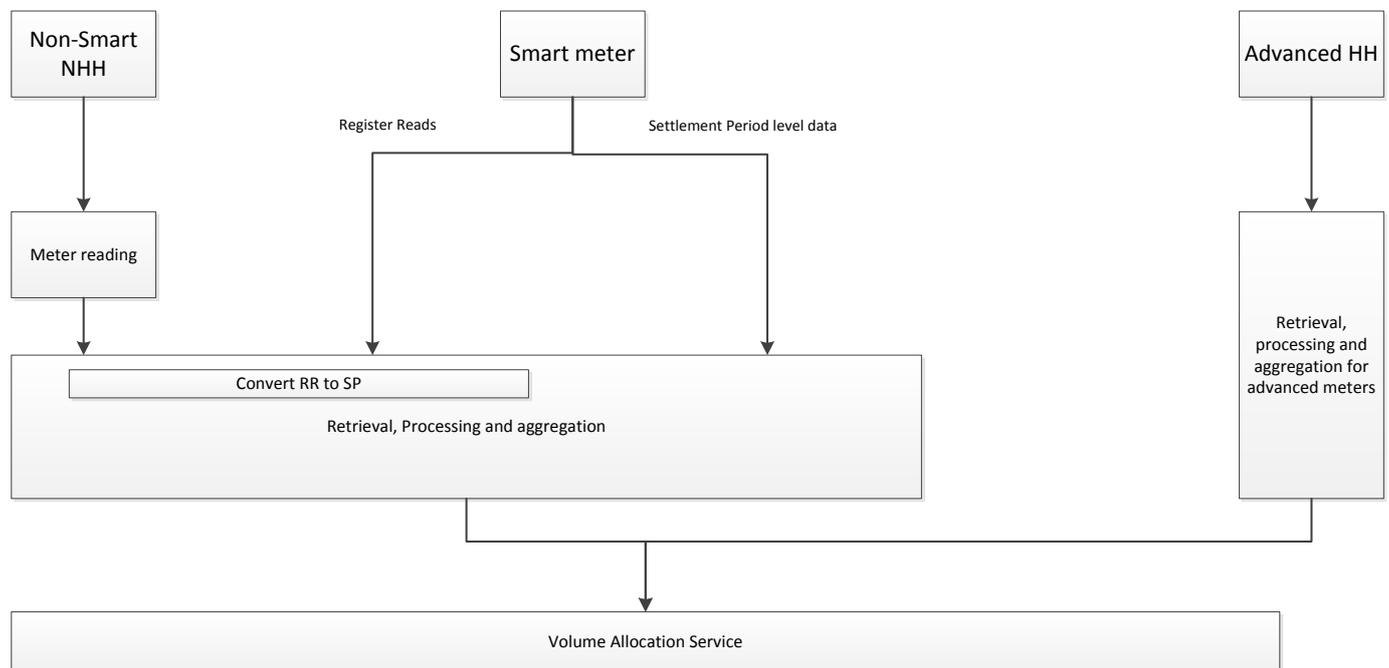
The basis of TOM C is that there is a recognition that the current market roles of Data Collection (including Retrieval) and Aggregation are most commonly done by the same organisation in the existing HH Advanced market. The 'DC/DA split' was largely a function of the NHH market where aggregation was done using complex rules and using instructions from the NHHDC containing Annualised Advanced and Estimated Annual Consumption. NHHDA's also use the Party Agent software supplied by ELEXON and so there was a natural separation on that basis as well. However, in an all half-hourly market, that split is less significant, and so the natural consequence is a combined DC/DA (DR/DP/DA) service.

TOM C also offers the fewest handoffs between service providers as they are likely to be done within the same organisation (although some might outsource Smart Meter Retrieval while still being the official Retrieval Service).

Again, the DWG noted that TOM C could be varied to split the Service for register readings from that for SP-level data.

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TOM C: Business process model: E2E Service covering Retrieval through to Aggregation



Features:

- Combination of Retrieval, Processing and Aggregation reduces hand-offs, potentially reducing data quality issues.
- Volume Allocation Service is procured centrally.
- Combined Retrieval, Processing and Aggregation Service means a provider must be responsible for all three services.

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TOM D: Separate Services for maximum optionality with Market Wide Aggregation

M2B TOM D	Retrieval Service	Processing Service	Aggregation Service	Volume Allocation Service
Smart Meter with HH data	Smart Meter Retrieval Service	Smart Meter Processing Service	Aggregation Service (Market Wide)	Volume Allocation Service
Smart Meter without HH data				
Advanced Meter TOM I	Advanced Meter Retrieval and Processing Service			

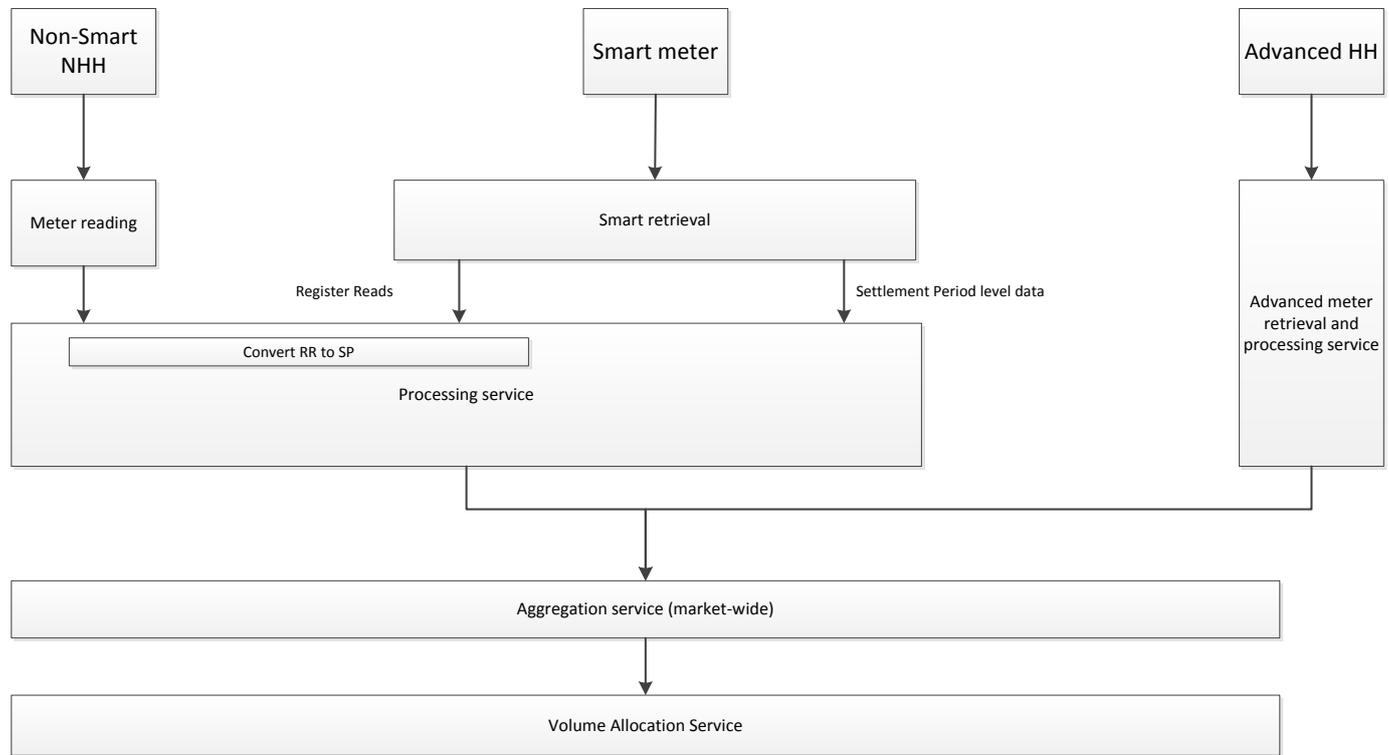
DWG discussion on TOM D

The basis of this TOM is that the four essential 'Meter-to-Bank' services identified in Meeting 2 are all left separate to allow the maximum amount of optionality in how these are delivered in a new 'all half-hourly' market. As a consequence of this, Aggregation has been explicitly defined as a Market Wide service only. The DWG noted that the Smart Meter Processing Service could further be split into two services on the basis that the conversion of register reads into SP-level data was a bespoke activity, without which the Smart segment would look quite similar to the Advanced HH processes.

However, the DWG felt that separating Retrieval from Processing in the Advanced Meter segment was not practical as processor needs access to the Meter for validation purposes. Equally, because Smart Meters are read via the DCC and access is governed under the Smart Energy Code (SEC), the DWG felt that by making Retrieval a defined service under the BSC, it would offer flexibility should the eventual providers of that service need to accede to the SEC. This TOM would also support a market wide Retrieval Service that is independent of Processing.

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TOM D: Business process model: Separate Services for maximum optionality with Market Wide Aggregation



Features:

- Centralised aggregation means all the SP-level data would be aggregated centrally, thus facilitating independent aggregators (demand-side response), peer-to-peer, system operation by DNOs, data for network charging.
- Market-wide Services (Aggregation and Volume Allocation) require centralisation however minimal grouping means maximum opportunity for competition in the provision of the other services.
- The significant difference from the status quo is the centralisation of the Aggregation Service.

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TOM E: Single central Service covering Retrieval through to Volume Allocation

M2B TOM E	Retrieval Service	Processing Service	Aggregation Service	Volume Allocation Service
Smart Meter with HH data	Smart Meter Centralised Retrieval, Processing and Aggregation Service (Market Wide, Single instance)		Single Central Aggregation and Volume Allocation Service (Market Wide)	
Smart Meter without HH data				
Advanced Meter TOM III	Advanced Meter Retrieval and Processing Service			

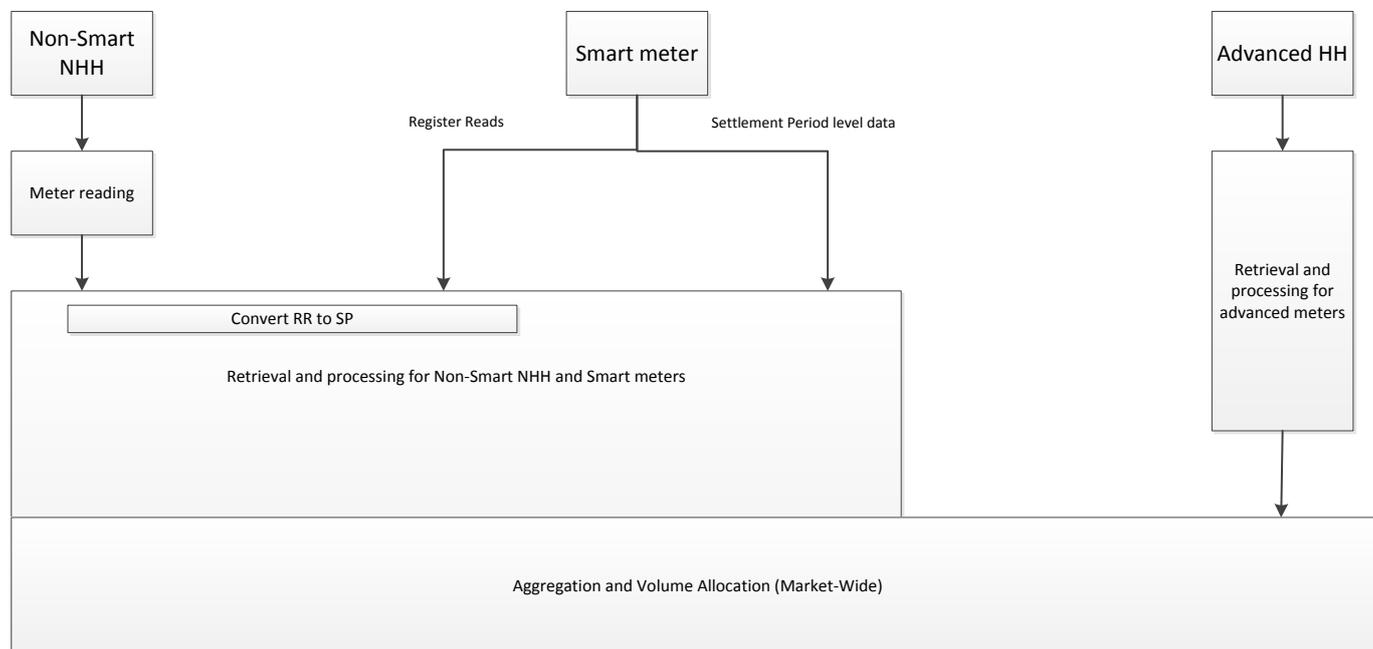
DWG discussion on TOM E

This TOM is based on a single central Service for Smart Meters that could retrieve readings via the DCC, process, aggregate and provide Volume Allocation Services. For Advanced Meters, the DWG didn't think this end-to-end option was practical but agreed that the Aggregation and Volume Allocation elements of the single central Service could be used for Advanced meters, leaving Retrieval and Processing similar to what HHDCs currently do.

As with any centralised option, the DWG noted that controls would have to be in place to ensure that data access and security concerns were addressed.

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TOM E: Business process model: Single central Service covering Retrieval through to Volume Allocation



Features:

- Centralised aggregation means all the SP-level data would be aggregated centrally, thus facilitating independent aggregators (demand-side response), peer-to-peer, system operation by DNOs, data for network charging...
- Combination of Retrieval, Processing, Aggregation and Volume Allocation reduces hand-offs, potentially reducing data quality issues.
- Market-wide Services (Aggregation and Volume Allocation) require centralisation so combining this with data retrieval and processing for smart/non-smart meters reduces options for competition in the provision of these Services.
- This TOM requires one centralised provider executing data Retrieval, Processing, Aggregation and Volume Allocation Services.

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Other Service Groupings

ELEXON presented the other service groupings that had been parked for discussion while the details of the other parts of the TOM designs were agreed.

Metering Services

On metering Services the DWG agreed that although there was only a single 'Use Case' identified in DWG Meeting 2 that the Service should be defined separately for 'Complex' Metering Systems such that a party only wishing to provide metering services for smart and non-smart Meters could enter the market. It was also suggested that the boundary for 'Complex' Metering Services would be the Current Transformer (CT) boundary.

Registration Services

On Registration Services the DWG noted that the Central Switching Service is scheduled to go-live in 2020. The DWG noted that the RP2a solution did not impact any of the proposed TOMs since it fed information into the existing registration system. The DWG agreed that no changes to registration were proposed other than noting that the systems may require different and additional data items in the future.

Unmetered Supplies Services

ELEXON presented a strawman TOM for Unmetered Supply Services at Settlement Period level. ELEXON pointed out the large number of customers have modest inventories of UMS and suggested an approach the aggregated these by Supplier within each distribution region. The DWG could not agree the aggregated approach but noted at present this decision was not fundamental to the development of the draft TOMs. The DWG agreed that a SP Level Service would be applied to all TOM scenarios.

Load Shaping Service

ELEXON presented the criteria for Load Profile that were used for the 1998 market. These included the importance of selecting profile groups which can be readily applied to a large number of customers, and which will not be subject to mis-application or manipulation.

The DWG agreed that a 'Load Shaping Service' is best provided by a single service such that the load shapes are common within segments. The DWG agreed that the Load Shaping Service would use data provided by the Service that undertook processing for smart Meters. The load shapes would then be provided back to that service for use in conversion of register reads to half-hourly values.

DWG Decision on draft Skeleton TOMs for Evaluation and TOM ranking

ELEXON agreed to draft the deliverable for Ofgem and the Design Advisory Board including the other Services Groupings agreed by the DWG. ELEXON agreed to work-up the diagrams, high level Service Descriptions for each Service Grouping and set out the pros and cons of each TOM.

The DWG considered whether any of the five TOMs could be discounted at present. The DWG could not rule any out since they believed all TOMs were viable. The DWG were then asked to rank the TOMs and set out their top 3. The DWG agreed that TOMs A, C and E should be focussed on - noting that TOMs B and D had a separate Retrieval Service which unnecessarily increased the number of hand-offs. TOM D also had the most hand-offs overall which the DWG considered to retain many of the issues with the current market design.

DWG: TOM DEVELOPMENT DESIGN WORKING GROUP

The DWG proposed five draft Skeleton TOMs for progression and evaluation:

- TOM A: Combined Retrieval and Processing with Separate Aggregation;
- TOM B: Separate Retrieval with Combined Processing and Aggregation;
- TOM C: Single End-to-End service covering Retrieval through to Aggregation;
- TOM D: Separate Services; and
- TOM E: Single Central End-to-End Service covering Retrieval through to Volume Allocation.