

Attachment A - An Alternative Target Operating Model (TOM) for Market-Wide Half-Hourly Settlement (MHHS)

1. Introduction

- 1.1. The purpose of this document is to propose an alternative TOM, which we believe would secure greater benefits through reduced costs, improved efficiency and ease of implementation, whilst maintaining open access to non-aggregated consumption data for settlement and other purposes. We outline the key issues we've identified with the Design Working Group's (DWG) TOM, describe the differences in the alternative TOM, address Ofgem's arguments for central systems using non-aggregated data for settlement calculations, provide an assessment against the TOM evaluation criteria and highlight the anticipated costs of the alternative solution.
- 1.2. The Association of Independent Meter and Data Agents (AIMDA) represents seven of the largest independent Data Collectors and Meter Operators in the non-domestic market. Our members have a combined experience of 150 years in supporting the HH settlement arrangements, and in terms of meter points, collectively manage 80% of the existing HH market and 70% of the NHH 03-04 market.
- 1.3. This expertise has proven instrumental in the development and delivery of large-scale industry change programmes like P272 and the Smart meter roll-out. The metering installation and maintenance, data collection, processing and aggregation services provided by our members ensure that approximately £10bn of electricity trades between suppliers and generators are settled accurately, efficiently and promptly every year.
- 1.4. The electricity settlement reform Significant Code Review (SCR) is both an essential ingredient of the Net Zero ambition and an opportunity to align the meter to bank process with a world where Smart metering systems (AMR & SMETS) are standard. Ofgem's IA suggests that there are significant potential benefits to MHHS but they are difficult to quantify and highly sensitive to unpredictable external dependencies.
- 1.5. Therefore, selecting a TOM and supporting technical architecture that is optimised for cost, efficiency, security and innovation is vital to ensuring the enduring success of the SCR.
- 1.6. Ofgem's minded-to position on the TOM, as summarised in paragraph 3.67 of the IA Consultation is that, "*Under MHHS, non-aggregated data should be made available to BSC Central Settlement Systems for the purpose of calculating the settlement imbalance*".
- 1.7. We believe this minded-to position on the DWG's TOM is not the optimal solution. This is because it would require the delivery of HH data to a central settlement service for all 30 million meter points in the market. However, central systems only needs to know about SP level data on a very small percentage of sites at any one time (e.g. those participating in TERRE, currently <0.01% or those that are subject to a trading dispute). This is therefore highly wasteful in terms of data transport and storage costs as well as creating a single vulnerability from a security and privacy perspective.

- 1.8. This alternative TOM addresses these points whilst maintaining the benefits of making access to non-aggregated consumption data open. This could be to assist policymaking, innovation and switching; or to support subsidiary settlement processes such as disputes, secondary calculations and performance assurance.

2. Issues with the DWG's TOM and Ofgem's minded-to position

- 2.1. We have previously shared our concerns about the potential impacts to competition of the DWG's TOM and Ofgem's minded-to position, and those remain. We would welcome a stronger statement from Ofgem that Mod P390 will not be used to unduly circumvent scrutiny of proposals to expand Elexon's commercial operations and remit (paragraph 3.53 in consultation). We still view the DWG TOM and Ofgem's minded-to position as an unnecessary expansion of an existing monopoly and would look to Ofgem under any model to impose the necessary controls around Elexon's activity to prevent unfair competition.
- 2.2. Removing the Data Aggregation function that occurs outside of central systems will introduce unnecessary inefficiency into the settlement arrangements. The Settlement imbalance is calculated with aggregated data, the SCR does not seek to change this. Therefore, for the purposes of calculating that imbalance, central systems does not need to know the SP-level data for 30 million metering systems.
- 2.3. Similarly, transferring and storing market-wide non-aggregated data is costly. Where the preceding function, each segment's data service, is already collecting, validating and storing that data, it is an unnecessary duplication of cost and inefficient for central systems to also store it. Especially when their actual uses for meter point SP-level data are limited.
- 2.4. Paragraph 3.56 of the IA suggests that Ofgem and Elexon view the design of the Load Shaping Service (LSS) as justification for performing total aggregation within central systems, "*The design of the load shaping service as part of the TOM would require central systems to process large amounts of meter point level HH data so as to create the load shapes. There would, therefore, be no significant cost saving from storing less data if data were to be aggregated outside central systems for settlement*". This ignores the possibility of the LSS itself receiving data that is aggregated in the required categories. Therefore, if both the LSS and the Supplier Volume Allocation Agent (SVAA) and/or Market-wide Data Service (MDS) receive aggregated data there is indeed a cost saving from transferring and storing less data comparative to the DWG's TOM.
- 2.5. Non-aggregated data would be accessible under the alternative TOM but would not need to be shared on a market-wide basis at any one point in time, and therefore will be more efficient and cost-effective.

3. Alternative TOM

- 3.1. The alternative TOM outlined in this paper shares many elements of the DWG's TOM. The market is segmented by meter type; Smart, Advanced and Unmetered, with corresponding Metering and Data services. The constituent elements of the Smart Data service (MDR, MRS and PSS) are not shown for simplicity.

- 3.2. The first key difference is that the model includes a recommendation for how non-aggregated data could be held in a distributed fashion and shared with central systems, for legitimate settlement related purposes, and other interested parties. Unlike the DWG's TOM it also makes some architectural recommendations around this specific feature.
- 3.3. **Data Request Service (DRS):** this would be a new service that is competitively procured by Industry. It would receive requests for data from several sources; Industry participants, Consumers or those acting on their authority and other interested parties, such as policymakers or academia. Different access rules would apply depending on the source and nature of the request. Therefore, triage of data requests for privacy, consent, security and confidentiality purposes would be a feature of the DRS, just as it is for the MDS under the DWG's TOM. Through synchronisation with the Registration Service, the DRS could identify the correct combination of Data Services it needs to forward that request to. Upon receipt of such a request, each Data Service would be required to output the result to the DRS within a defined SLA timescale. The DRS would consolidate responses from individual Data Services to return to the requesting party. API access would be available to industry participants.
- 3.4. The second difference is that each Data Service has a Data Aggregation function within it. This would be a formal consolidation of the Data Collection and Aggregation roles that the market has naturally tended towards historically. It also ensures that data is collected, processed and aggregated in the same place, reducing transfer and storage costs. This is aligned with the original Skeleton TOM C.
- 3.5. The key Data Aggregation requirements of the Data Services would be;
 - 3.5.1. Generation and output of consumption data aggregated by Consumption Component Class, Supplier and GSP Group (optionally by Balancing Mechanism Unit) and adjusted for losses to the Supplier Volume Allocation Agent (SVAA) for Settlement calculations
 - 3.5.2. Ad-hoc provision of data in the required configuration/format to fulfil requests from the DRS
 - 3.5.3. For the Smart Data Service; generation and output of consumption data aggregated by load shape category to the LSS for market average load shapes to be created for estimation purposes
- 3.6. The third difference is that there is no requirement for the Market-Wide Data Service (MDS) and thus less development of central systems. The Supplier Volume Aggregation Agent (SVAA) can continue in its current form.
- 3.7. Overall, this means that for Settlement purposes, consumption data is only transferred in aggregated form but is accessible non-aggregated or in different configurations depending on the requirement. In terms of the meter-to-bank settlement process, the alternative TOM more closely resembles the existing market model and therefore represents a simpler, less intrusive and more proportionate means of achieving Ofgem's policy objectives under the SCR.

Figure 1: Alternative TOM Diagram

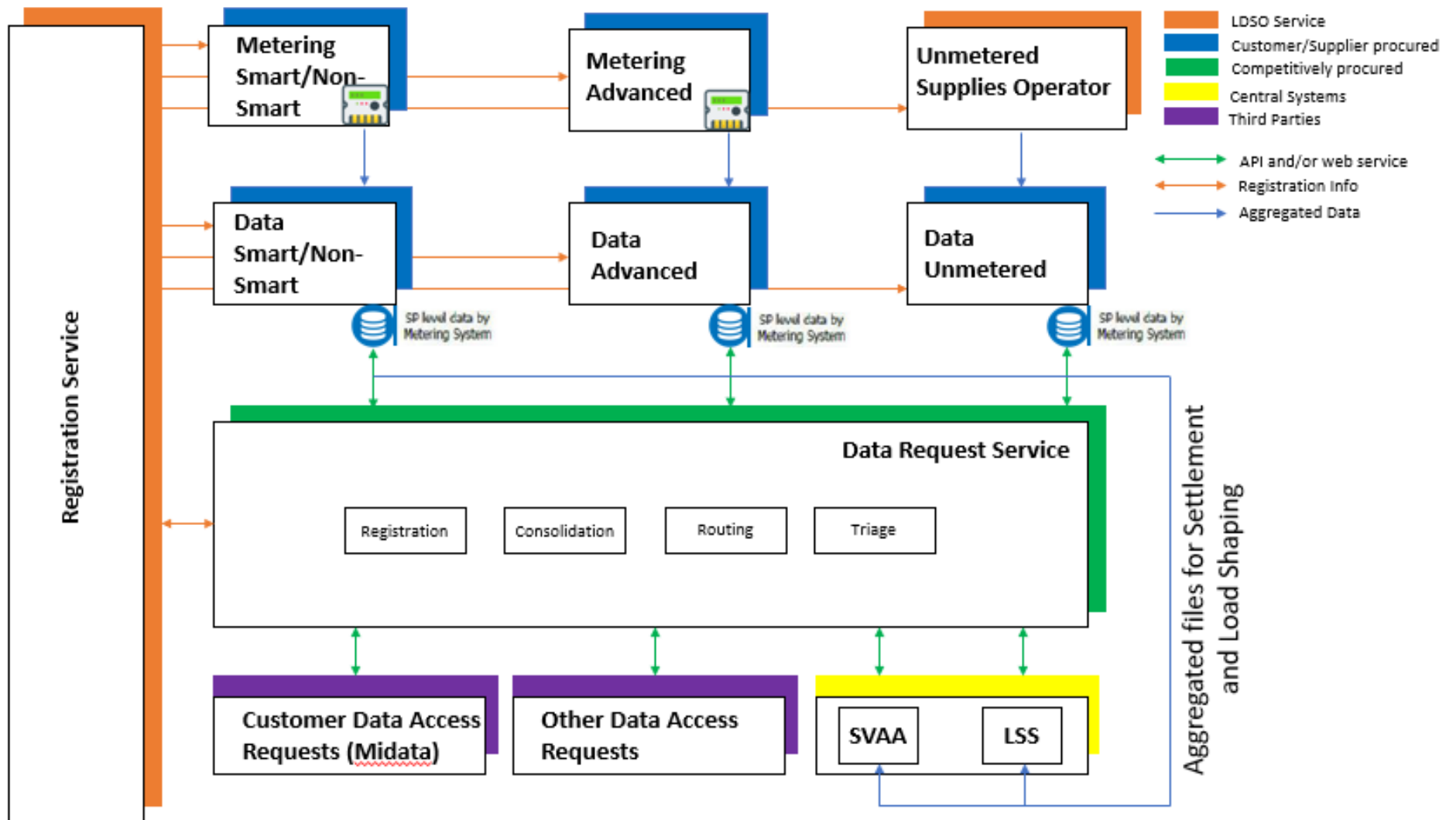
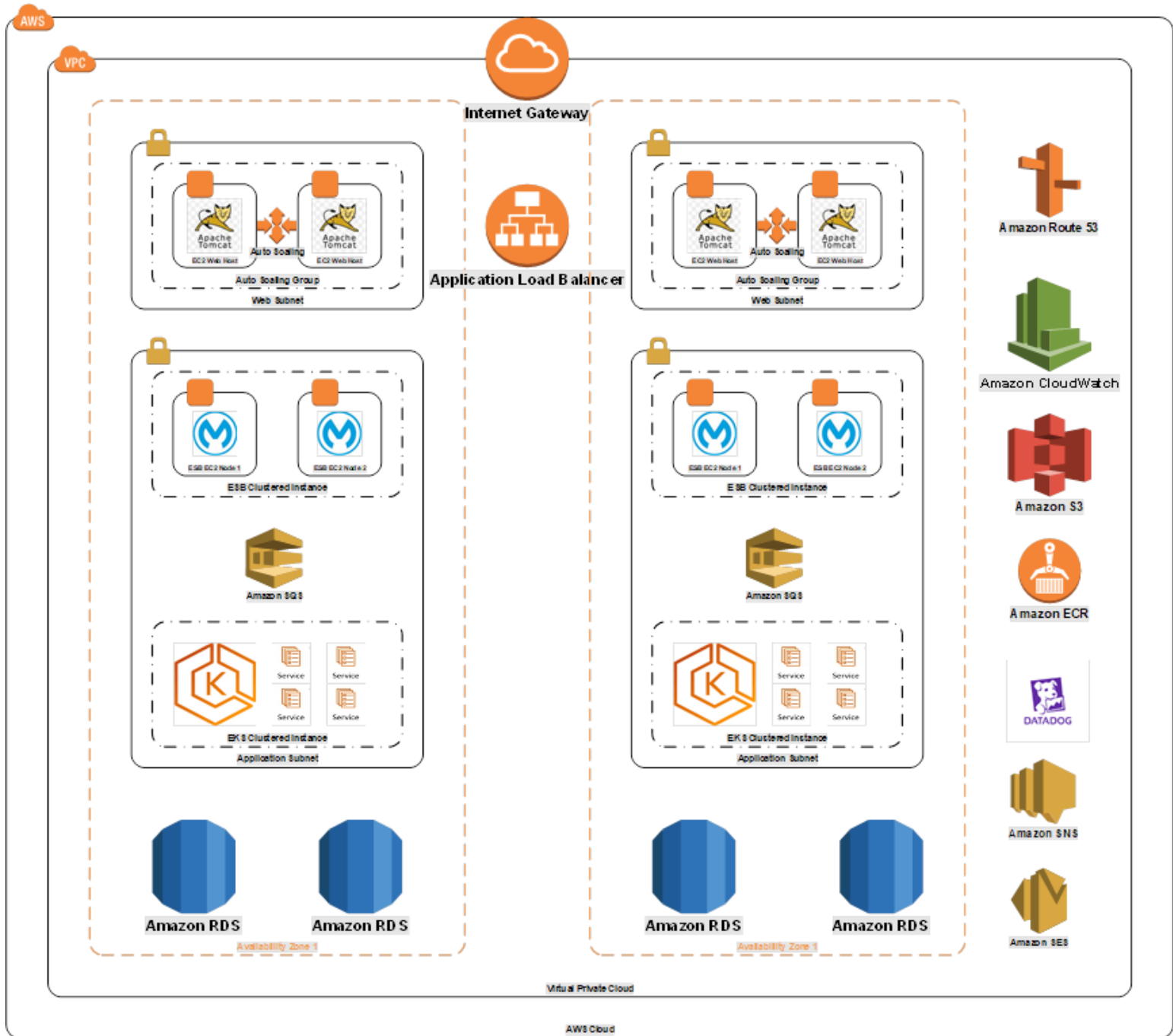


Figure 2: DRS Architecture



4. **Ofgem’s Arguments for central systems using non-aggregated data for settlement calculations**

- 4.1. In paragraph 3.21 of the IA Consultation, Ofgem outline their arguments for central systems using non-aggregated data to perform settlement imbalance calculations. We replicate each one below and provide a response.
- 4.2. ***“Efficiency and cost-effectiveness: There would be no need to aggregate data for settlement purposes both at the supplier agent level and in central settlement systems, as it is the case today. Additionally, changes to settlement calculation rules would be more simple and timely to implement (as they only need to change in one system).”***
- 4.3. **Response:** At face value, total aggregation in one place under the DWG’s TOM appears efficient, however; it requires the daily transfer of settlement period data for 30 million meter points from multiple data stores to another, from each data service to central systems. The same data will need to be stored twice in separate locations; at the Data Service and in central systems. The costs of non-aggregated data transfer and storage will be much greater. By way of comparison, under the alternative TOM, non-aggregated data is only stored in one location, data transfers occur at an aggregated level and therefore is more efficient and cost-effective. Non-aggregated would still be accessible under the alternative TOM but would not need to be shared simultaneously on a market-wide basis.
- 4.4. ***“Greater potential for flexibility in the aggregation of data for settlement. For instance, siloing of aggregated data would no longer occur within different supplier agents systems by supplier and GSP Group. Instead, aggregations could occur across suppliers, GSP Groups and other metrics. This will also allow greater flexibility in the types of data aggregation for settlement that can be carried out, and facilitate adaptation should further changes be required in the future.”***
- 4.5. **Response:** The aggregations Ofgem describe cannot be intended for core settlement. How does aggregating across suppliers benefit settlement? This would result in the metered volumes for multiple suppliers being mixed, making effective settlement of each individual supplier’s contracted volumes impossible. For the purposes of settlement, data must be aggregated in a certain way. The consultation recognises this in its description of the new Market-wide Data Service (MDS), *“the MDS will aggregate the data by Grid Supply Point and Group and balancing mechanism unit”*¹. The only real variable is the Consumption Component Classes, which might benefit from future adaptation as the drivers for group correction become clearer. Changes to CCCs can be managed just as effectively across multiple systems as in a singular one. Similarly, changes to Load Shape categories can also be easily implemented. There could be benefits of increased flexibility through access to non-aggregated data for purposes outside of core settlement, however; using this as an argument to support central systems using non-aggregated data for the settlement calculations is unnecessary and disproportionate. Under the alternative TOM non-aggregated data can still be accessed by central systems but in a much more targeted and therefore efficient way.
- 4.6. ***“Data quality benefits for settlement: the reconciliation run process could have data drip fed into it as it becomes available, therefore giving earlier sight of completeness and issues before***

¹ Ofgem, June 2020, *Electricity Retail Market-Wide Half-Hourly Settlement: consultation*, paragraph 3.18, p37

scheduled settlement runs are undertaken. Duplicates/missing/erroneous data can be identified across the whole of the system if all MPAN level data is compared, and final dispute runs would only be run with the data involved in an authorised trading dispute. This removes the opportunity for unauthorised revised data to be re-submitted after the final reconciliation run.”

4.7. **Response:** the process described by Ofgem here already occurs at Supplier Agent level; a view of data completeness and accuracy is built up between runs and actions are taken to improve the overall position before the next run is performed. Introducing an additional layer to this process will not provide any benefit and could cause inefficiency, for instance; if central systems raise an exception that the data service is already aware of and investigating. The proposed improvements to the Registration service should eliminate the occurrence of duplicate and missing data as ambiguity over responsibility for data provision to settlement is removed by having a single source of truth. This reduces the potential benefit of an additional market-wide validation step. In the case of dispute runs, under the alternative TOM, data specific to that dispute could be accessed by Elexon via the DRS when required as opposed to being held indefinitely by central systems without purpose in the majority of cases.

4.8. **“Competition benefits:** *If non-aggregated data used for settlement is also made available to third parties (in accordance with data protection rules) this could enhance competition, not only in Value-Added Services, but also by making it easier for businesses to offer innovative new services to suppliers and/or consumers.”*

4.9. **Response:** we agree that this would foster competition in one area but the mechanism proposed by the DWG and Ofgem would hamper it in another. The alternative TOM ensures that competition is promoted and maximised in all areas of the energy market, including metering and data services. The same access arrangements to non-aggregated data can be made under the alternative TOM without removing competition in Data Aggregation services.

4. Assessment against TOM Evaluation Criteria

4.1. The alternative TOM shares many elements of the DWG’s TOM and therefore shares many of its benefits. Assessment of the alternative TOM against the evaluation criteria used by the DWG towards the end of their Stage 1 work demonstrates this. Where relevant, a comparative assessment with the DWG’s TOM is provided to highlight the additional advantages of the alternative TOM.

Criterion	Key Considerations	Alternative TOM	Comment
Coverage	Meets requirement in the Key Roles and Responsibilities document	✓	The alternative TOM covers the entire meter to bank process. By closely mirroring the existing market model, there is assurance that there are potential participants to fulfil each role. Moreover, the TOM covers an adapted Data Service role to include Aggregation activities and outlines an entirely new Service, the Data Request Service, to facilitate access to non-aggregated data. All meter types are covered and arrangements remain in place for Export and UMS supplies. Whilst customer billing is not a settlement consideration, suppliers will continue to be able to obtain data for billing through a number of avenues.
	New or adapted role types	✓	
	Meter Types	✓	
	Export Coverage	✓	
	UMS Coverage	✓	
	Customer billing interaction	✓	
	Potential participants to fulfil role	✓	
	Registration arrangements	✓	
Cost Reflectivity	Quality of data to settlement	✓	Use of SP-level data is maximised across all customers and meter types. Subsequent network charges can be more cost reflective as they will be based on actual time of use consumption data. Consumers who opt-out of HH data for settlement or experience remote communications failures will be able to HH settled using load shapes that are more accurate than today.
	Customers and meter types	✓	
	Network charges	✓	
Timing	Timing of Initial Settlement Run	✓	The alternative TOM would support reduced SF and RF Runs.
	Timing of Final Reconciliation Run	✓	
Design Simplicity	Statement on simplicity of design	✓	The alternative TOM more closely mirrors the existing HH settlement arrangements than the DWG’s TOM and would therefore be simpler to implement. It would also require less development of central systems as the MDS is not required. Equally, the LSS would only need to handle aggregated data. Due to its distributed nature, the alternative TOM is more robust from a security and resilience perspective.
	Impact of supporting smart and traditional solutions	✓	
	Robustness and ease of upgrading	✓	
	How adaptable the TOM is and why?	✓	

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Design Flexibility	How will it handle bulk CoS events	✓	The alternative TOM can accommodate potential changes to Data Privacy, Consumption Component Classes, Aggregation for Settlement, Load Shape categorisations and any other external factors that might impact settlement. Bulk CoS and Supplier of Last Resort events can be handled in a similar way to the DWG TOM. Data hand-offs are significantly reduced under the alternative TOM as market-wide non-aggregated data is not passed to central systems and the Data Aggregator role is formally consolidated with the Data Collector to form an integrated Data Service.
	Supplier of last resort	✓	
	Number of data hand-offs	✓	
Data Privacy	Is the TOM compatible with Ofgem’s Policy Decision on Data Privacy?	✓	The alternative TOM would support Ofgem’s policy decision on Data Privacy – that domestic consumers can opt-out to daily granularity of data. As outlined above, if this were to change in the future there is nothing in the TOM that would preclude this.
		✓	
		✓	
Solution costs	A relative assessment of the likely costs of the TOM for all stakeholders (not including implementation costs)	✓	AIMDA provide an estimation of the solution’s costs in section 5 of this document. We believe that overall implementation costs for the solution would be equivalent to those provided by Elexon in the IA and that ongoing costs would be lower through more efficient data storage and transmission.
Ease of Implementation	Summary plan with appropriate allocation of roles & responsibilities	✓	The transition approach developed by the DWG and Ofgem’s proposals for Programme management can be applied to the alternative TOM.
	A practical transition approach	✓	
Impact on small suppliers & new entrants	Identifying specific issues for small suppliers/new entrants stemming from an assessment of other criteria	✓	The alternative TOM doesn’t present any barriers to new entrants in retail supply, metering or data services.
Supports New Technologies and Innovation	Identify how access to different levels of meter and aggregation could support new technologies or other innovation such as DSR, Peer-to-Peer and Smart Grids	✓	The Data Request Service will provide a level playing for those with legitimate interest to access consumption data for innovation purposes.

4.2. Additionally, a clear advantage of the alternative TOM is that it does not remove competition in the supplier agent market, which is more consistent with Ofgem’s reliance on Administrative Exclusion “D” - *“Deliver or replicate better competition-based outcomes in markets characterised by market power: Pro-competition document”* for the Impact Assessment.

5. Cost Comparison

- 5.1. Comparison of the costs between the alternative TOM and the DWG's TOM is hampered by the lack of detail around the breakdown of "central costs" in the IA. Given that the main difference between the TOMs are the "central" aspects.
- 5.2. However, there are clearly substantial cost benefits to be derived from efficient data storage and data transport.
- 5.3. There is an inefficiency in the Data Services copying the data to the MDS for all 30 million (or more) metering points. The Data Services will need to keep a copy of the data that they provided for auditing purposes, so there is data duplication. This is a substantial data set, estimated at over 750 billion records per annum for the market. Duplication of this data will incur additional costs in storage, back-up, archiving, processing and transport. Having investigated the operational costs associated with the alternative target architecture contained within this document we can confirm that data transfer costs make up a significant proportion of the ongoing costs even considering the vastly reduced size of data transmission associated with our model.
- 5.4. The costs of processing the data for pre-aggregation into settlement, for load-shaping, and for providing access to data requests will be similar across the two arrangements. Centralisation will not reduce these costs but will incur additional costs due to its inefficient architecture. AIMDA have conducted an initial investigation into the costs of implementing a decentralised data store, facilitated by the creation of a data request mechanism and application layer and can confirm that the associated costs are not more than those stated by Elexon in the Draft Impact Assessment.
- 5.5. Implementing the revised architecture reduces ongoing cost by being efficient with data storage and data transmission. Inclusions of various access methods (web calls and API's) allow cost efficient methodologies for third parties to access the data in a controlled and secure manner while 'request tokens' can temporarily store data access requests for a short period to avoid placing stress on end user systems with unnecessary repetitions.
- 5.6. Additionally, distributing the storage of market-wide data across competitive data services agents will increase cost pressure on this activity in the long-term, leading to lower overall costs for these services to the industry.
- 5.7. The alternative TOM provides the best in current architecture to provide cost efficiency both now and in the future. It provides the same access to data without the potential for misuse and does it in a highly scalable and cost-effective manner.