

ENA High Level Smart Metering CBA

Summary Report

This report provides a summary of the high level cost benefit analysis undertaken in respect of the "ENA Smart Metering System Requirements Update". The benefits considered are those which would accrue even in the absence of 'smart grid' solutions, while the costs considered are those associated with functionality that is incremental to the SRSM requirements. The analysis does not consider the very much greater benefits of avoided network reinforcement that would accrue from the application of responsive demand solutions to minimise the impact of significant penetrations of electric vehicles and heat pumps (which is the subject of a separate report by SEDG: "Benefits of Advance Smart Metering for Demand Response based Control of Distribution Networks"). The objective of this study has been to identify the incremental costs of the ENA Requirements (over and above the SRSM requirements) alongside the additional network operational and planning benefits (other than those associated with the application of responsive demand / 'smart grid' solutions) and evaluate the resulting cost-benefit in NPV terms. The positive NPV outcome provides further evidence to DECC and Ofgem E-serve of the justification for incorporating the ENA Requirements into the final specification for the proposed national smart metering system.

Summary

The approach followed in deriving the cost benefit analysis in respect of the ENA Requirements is described in the next section. The key starting point for this analysis is a comparison of the ENA requirements against the ERA SRSM updated requirements in order to accurately identify which requirements within the ENA specification are truly incremental to (as opposed to duplications of, or minor variations on) the SRSM specification. This cost benefit analysis is based on these assessed incremental requirements.

While each of the individual elements of this cost benefit analysis has been developed as an individual product, this report summarises the results across the main categories.

The project then used the identified incremental ENA requirements and compared them to the information provided by BEAMA member Meter Asset Providers aiming to derive the cost of each requirements. The additional cost of providing the firm (non-optional) ENA requirements within the meter specification is expected to be in the region of £0.60 - £1.10 for electricity meters and £0 for gas meters (the latter on the basis that calorific value will not be calculated by the meter). There are additional optional requirements that could increase the cost of the electricity meter by c. £1.50 - £7. However, while some or all of these requirements could still be justified subject to further exploration of the range of costs estimated by the MAPs, for the purpose of this CBA the functionality is assumed not to be justified at this stage and neither the benefit nor the cost is therefore included in this analysis.

The next step of the project consisted of the Data Traffic analysis, which identified common ERA/ENA and ENA only data flow. The analysis suggests that in considering the total estimates of data flow for ENA related functionalities, the proportion of common ENA and ERA related data to support both network planning and ToU tariffs is in the region of 12-15% for total data traffic for gas and electricity meters per year. However, this figure could

increase significantly if it is assumed that suppliers will also eventually require more granular consumption profiles e.g. half hourly energy consumption profiles. Since the results of this aspect of the analysis cannot be incrementally costed at this stage due to current uncertainties within the smart metering rollout and communications architecture policies that are to be adopted, this aspect of the analysis is provided in terms of incremental traffic for use in the Ofgem and DECC cost model.

The further step of the analysis provided high-level identification of the potential scale of developments to DNO systems and processes necessary to accommodate smart metering data (both for routine billing of consumption, and for network management purposes). This part was not quantified at this stage as the scope of such developments will be dependent on the ultimate design of the central communications system. Such developments will be informed by any pilot stages of the smart metering roll out programme (including any interim arrangements if the programme is brought forward) and potentially from the findings from Low Carbon Network Fund trials (the latter being particularly relevant to network management and smart grid developments).

After the costs have been identified, the project followed then with the identification of benefits of functionalities required by the ENA members. The benefits arising from the ENA incremental requirements have been quantified where possible and have been derived from a high level analysis of the benefits associated with improved operational management and network planning information following the approach described in the DECC Impact Assessment.

For the reasons outlined above, the analysis would be impacted by further consideration of costs which are dependent on the central communications solution and which therefore cannot yet be quantified (such as those that might be necessary to manage the increase in data traffic and the enhancement of DNO information management systems). On the other hand the analysis does not include 'intangible' benefits as identified in the DECC IA and ENA Use Case analysis such as an improved customer service experience.

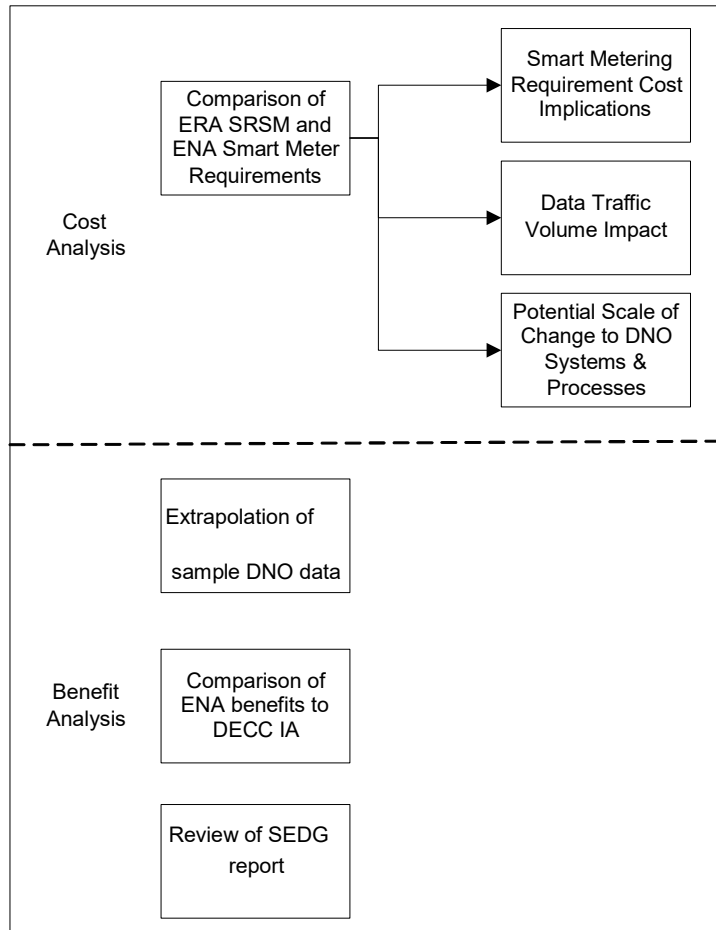
While this analysis considers the 'business as usual' network management benefits that would accrue from the availability of smart metering data, it is important not to lose sight of the 'several orders of magnitude' higher level of benefits that would accrue in the likely event that, during the lifetime of the first generation of smart meters and systems, there is a significant take up of electric vehicles and/or heat pumps. The SEDG report for ENA "Benefits of Advanced Smart Metering for Demand Response based Control of Distribution Networks", highlights the potential avoided cost of HV and LV network reinforcement if smart metering systems can be used as an enabler for the application of responsive demand solutions. The report estimated the potential avoided distribution networks reinforcement costs to be in the range of £0.5bn to £10bn (NPV), depending on electric vehicle and heat pump penetration levels, the degree of responsiveness of the associated demand, and the range of network reinforcement solutions that might be required.

On the basis of the analysis described above, the results of the **cost benefit analysis shows that the incorporation of the ENA incremental requirements gives rise to a positive net present value of c£50m** (based on a 20 year assessment to align with the DECC IA timescales).

Approach Followed

The diagram below describes the approach followed in the Cost Benefit Analysis.

Diagram 1 – Key activities of CBA



Introduction to Activities

These activities provide the ENA with a high-level Cost Benefit Analysis and an assessment of the network specific requirements of smart metering. These also provide rationale to support the work undertaken to date in the ENA smart metering project and can be used in sharing the high-level Cost Benefit Analysis with Ofgem.

The cost analysis looks at:

- A Comparison of ERA SRSM and ENA Smart Meter Requirements;
- The Extra Network Smart Metering Requirement Cost Implications Using BEAMA Cost Estimations;
- Data Traffic Volume Impact; and
- The Potential Scale of Change to Network Operator Systems & Processes.

The benefit analysis looks at:

- A Benefit Analysis for the CBA Model;
- ENA member functionality benefits in addition to benefits identified in the Government’s impact assessment published in December 2009; and

- Review of Imperial College and SEDG Report “Benefits of Advanced Smart Metering for Demand Response based Control of Distribution Networks” and Explanation of its Rationale for Cost Benefit Analysis.

The detail of which can be found in the ENA High Level Smart Metering Cost Benefit Analysis Document reference ENA-CR009-004-1.1