Department for Business, Energy & Industrial Strategy

Delivering a smart and secure electricity system

Consultation on interoperability and cyber security of energy smart appliances and remote load control

Response template

Closing date: 28th September 2022

July 2022

Any enquiries regarding this publication should be sent to us at:
SSESconsultation@beis.gov.uk

Invitation to respond to "Consultation on interoperability and cyber security of energy smart appliances and remote load control"

The consultation and supporting analytical annex is available at: www.gov.uk/government/consultations/delivering-a-smart-and-secure-electricity-system-the-interoperability-and-cyber-security-of-energy-smart-appliances-and-remote-load-control.

The closing date for responses is September 28th 2022

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Response form

Please complete the below pages with your information, and email it to us as a word document to SSESconsultation@beis.gov.uk

Or send it as a hardcopy by post to:
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Information about you and your response

What is your name? Yumann Siddiq

What is your email address? yumann.siddiq@energy-uk.org.uk

(If appropriate) What is your organisation? Energy UK

Which of the following descriptions best describes you/your organisation?

- Private individual ☐
- Manufacturer ☐
- Distributor / Seller ☐
- DSR Service Provider ☐
- Chargepoint Operator ☐
- Energy supplier ☐
- Trade body ☒
- Consumer group ☐
- Energy network/system operator ☐
- Public sector body ☐
- Other ☐

Are you happy for your response to be published in full? Yes

Are you happy for you/your organisation to be named in a document summarising the responses received? Yes

As part of your response, have you included any other information separately from this consultation response template? If so, please provide a brief summary of what it is? A cover letter to supplement our overall response with two key considerations.

Are you happy for us to contact you to keep you updated on the policy and consultation, including to notify you of stakeholder events and/or if we have follow-up questions on your consultation response? Yes

Consultation Questions

Questions detailed in consultation Chapter 1, "Introduction"

1. What are your views on the over-arching timings of implementation of these proposals, including the proposed approach to phasing?

Energy UK firmly supports the aim of unlocking flexibility through use of demand side response (DSR) services to benefit both consumers and the electricity system. We appreciate government's recognition of differences in energy smart appliance (ESA) markets with proposals being phased. ESA markets are nascent and varied, yet each highly innovative and complex. We therefore urge government to engage further with all relevant stakeholders prior to establishing firm dates for implementation.

Short Term:

With the assumption that proposals relate only to the domestic market, Energy UK agrees with the high level aim to require energy suppliers to make time-of-use (ToU) tariff data openly available in a common format over the internet by the mid-2020s. We will comment further as the policy develops and have detailed certain outcomes that should be met in our answer to Q10.

With regard to the proposal to require domestic-scale ESAs to meet minimum cyber security and grid stability requirements, we agree with the intention to implement this by the mid-2020s, however detail considerations for finalising a date in our answer to Q32.

Medium Term:

We support the requirement for heating appliances with the greatest flexibility potential to have smart functionality in the mid-2020s. All new low carbon heating assets should be treated the same, as they will all play an important role in the transition. For more detail on implementation of considerations for this requirement, please see our answers to Q28 and Q29.

Long Term:

We agree with the proposal to require larger domestic-scale ESAs to be fully interoperable with DSR service providers and meet further requirements for cyber security, grid stability and data privacy. However, we suggest that a firm implementation year is too early to prescribe and must be kept under review given the substantial complexity in both agreeing to a means for, and delivering these objectives. For example, advanced interoperability is desirable, but not yet technically deliverable. Notwithstanding this, there is also a need to balance timelines for delivering requirements with pace of electric vehicle (EV) and home charging uptake to ensure that the majority of consumers benefit from DSR services.

Energy UK strongly believes that market-based approaches to interoperability and cyber security, with desired levels of grid stability and data privacy will deliver the best outcomes for consumers and the energy system as a whole.

Questions detailed in consultation Chapter 2, "Cyber security proposals for protecting the energy system"

2. Do you agree with the Government's proposal to make certain load controllers subject to the obligations in the NIS Regulations? Please explain your answer.

We agree that as a key enabler of DSR, certain load controllers should be subject to appropriate and proportionate cybersecurity measures. However, the cost of implementing mitigation measures should be proportionate to the risks to the CNI that they seek to mitigate: a difficult analysis which requires careful consideration from the NCSC with close engagement from industry. It is not immediately clear how to balance probability with reality in such analysis, i.e. balancing 'what if x happens, so we must do y' with 'now that x has happened, how do we recover x' statements.

3. Do you agree with the Government's proposal of setting a threshold requirement of 300MW of remote load control for a load controller to be considered an operator of an essential service under the NIS Regulations? Please explain your answer, and provide supporting evidence.

We recognise that there must be a starting point at which load controllers are considered an operator of an essential service (OES) and our understanding is that the 300MW threshold requirement has been established through ongoing engagement with the Electricity System Operator (ESO). At a high level, the threshold appears to be appropriate, though we urge government and the ESO to clearly set out the rationale to industry once decided.

With regard to chargepoints in particular, though a chargepoint operator (CPO) may control X number of chargepoints and therefore theoretically manage X MW of load, in practice this is only true when every single individual charger is plugged in simultaneously, which in reality is never the case. If 300MW of load is established as the threshold by which an operator becomes an OES, a nuanced consideration of CPOs falling into this category may be necessary.

Finally, our assumption is that this threshold implies that any load controller with an ability to send signals, e.g. software and firmware updates, to multiple assets which cumulatively control over 300MW is subject to such requirements, even if an individual asset's load itself is much smaller. As such, we strongly urge government and the NCSC to provide utmost and timely clarity and detailed guidance on implementation steps accompanied with clear definitions on who this obligation applies to and when (including situations whereby the obligation may have been in place, but falls away at a later stage) given that requirements were originally designed for large CNI owners and operators. Other considerations include a proportionate approach, where, for instance, 300-450MW load controllers are subject to a lighter touch security regime than those of 450MW and above. We also suggest that Government keep this threshold under review in future as the energy system and consumer usage changes.

4. Are there any other threshold metrics that should be considered, for instance if organisations have more than a certain number of customers/appliances connected?

As with our answer to Q3, a nuanced approach may be required to establish whether CPOs satisfy (and maintain) the 300MW threshold in practice.

5. Do you agree with the Government's proposal of using the Cyber Assessment Framework (CAF) to support the implementation of the NIS requirements for load controllers? Please explain your answer.

Energy UK supports outcome-based requirements for cybersecurity, such as those that underpin the Cyber Assessment Framework (CAF) as an effective way to mitigate risks whilst allowing a diverse range of technologies and actors. However, we urge government to ensure that the implementation of the CAF framework remains flexible given the nascency of the sector and the relative immaturity of the companies within it. Implementation should recognise that as a new framework to comply with, CPOs and heat operators in particular will find it harder to readily comply than DNOs and suppliers, i.e. actors which already fall under the essential service category.

Questions detailed in consultation Chapter 3, "Energy smart appliances: Outcomes"

6. Do you agree with our proposed outcomes for interoperability? Please explain your answer

Energy UK agrees with Government's proposed outcomes for a minimum level of interoperability in order to deliver the best outcomes for consumers. We have seen first-hand, the benefits of ensuring interoperability during the rollout of smart meters, and it is essential that interoperability is a key requirement/principle for ESAs. For consumers, the process of changing service provider (and/or electricity supplier) should be simple, transparent and without the need for a physical site visit to replace or adjust any ESA supply equipment installed.

We support Government's proposal not to specify that an ESA work with any user interface or third-party operator, and that interoperability does not extend to other devices within the home.

7. What are your views on the initial proposed outcomes for cyber security of Energy Smart Appliances? Is there anything missing or not relevant?

At a high level, we agree with Government's list of initial proposed outcomes for cyber security and the intention to review and refine this list following further cyber security risk assessment with industry engagement. However, an absolute evaluation of outcomes is dependent on the approach to implementing these outcomes and whether this results in disproportionate costs. Government should next look to engage industry again with a refined list of outcomes, alongside greater detail on options for their approach.

8. Do you agree with Government's proposed data privacy outcomes for ESAs?

Whilst we agree with proposed data privacy outcomes for ESAs, Energy UK would urge Government to only consider future data privacy requirements that are not already featured in UK GDPR to avoid confusion on overlap and any possible contradictions. Focus should centre where additional protection is required beyond UK GDPR, for instance on sensitive data related to consumer consumption habits and preferences which can theoretically be used to identify an individual and their location.

We also urge Government to follow lessons learnt from smart meter rollout in that public-based messaging around data and permissions must be carefully crafted to avoid negative media sentiment that could result in consumers being discouraged from sharing energy consumption information that is essential to generate the greatest benefits for consumers and the overall system.

9. Do you agree with the risks to grid stability and proposed outcomes Government has identified? Is there anything missing or not relevant?

Energy UK agrees that the identified risks to grid stability can be caused by ESAs, however we cannot at this stage agree with all proposed outcomes identified for ESAs to mitigate these risks.

Several factors are at play when considering risks to grid stability and appropriate outcomes. Put simply, each risk identified can have multiple causes. For instance an unexpected step change can be caused by loss of communication, a malicious attack or reaction to price signals. Consequentially, each cause may also lead to its own potential outcome. Loss of communications may require randomisation at the firmware level, a malicious attack may require a cloud-level protection and reaction to price signals may warrant coordination at the supplier level, for example, to ensure that a cause of a reduction/increase in demand is not as a result of a consumer optimising the cheap/off-peak tariff periods with their electricity supplier.

Furthermore, whilst mindful of the necessity in introducing some short-term solutions for benefit to the system and consumers, medium to long-term solutions may be developed and deployable at a later stage.

With such considerations at play, Energy UK strongly recommends that Government undertake further stakeholder engagement prior to finalising desired outcomes, with an understanding that an evolutionary approach to solutions, and therefore outcomes, may be more valuable than establishing day-one mitigation outcomes to manage an ever-growing ESA user population. We suggest, at first, a process of mapping and modelling (informed by a defined/agreed set of use cases), with a focus on grid stability in a broader context to firmly establish outcomes and then solutions with all relevant stakeholders, ultimately benefitting consumers. Lastly, we stress that any additional requirements placed on ESAs inevitably place an increased cost on the unit, the impact of which must be assessed as part of a full cost benefit analysis.

It is essential that Government provides an ongoing commitment to work alongside key stakeholders to develop these medium/longer-term solutions, and sets out (in the response to this consultation) how it intends to deliver against this commitment.

Questions detailed in consultation Chapter 4, "Energy smart appliances: Technical frameworks"

10. Do you agree with Government's proposals to make time-of-use tariff data openly available in a common format for Energy Smart Appliances?

At a high-level, Energy UK agrees with the principles of the proposals to make ToU tariff data openly available in a common format, largely because there is already a recognised common format for documenting tariff structures (including block tariffs/time of use tariffs) as part of the configuration of smart meters – these are defined in Section 5.7.4 of the Smart Metering Equipment Technical Specifications (SMETS) and Section 7.3.7 of the Great Britain Companion Specifications (GBCS). All electricity suppliers operating smart meters must use the same format in order to ensure that smart metering equipment (including IHDs, CADs etc) displays accurate energy consumption information in the home, therefore it seems only sensible to utilise the common format already in use.

The main question therefore should focus on how the information recorded in this common format can be made openly available to parties that require it. The proposals as set out are clearly at a high-level at this stage and need further clarity in respect of the Use Case(s) - who they are aimed at and how the information/data will be used, what it is that the DSRSP / ESA Provider needs, concerns/complexity around the potential use of "public" tariff data, and what the intended consumer protection proposals are. We anticipate that many aggregators and service providers will be building products and services that rely on direct control/management of the devices they've installed in order to deliver maximum consumer benefits. It is essential that these factors are pinned-down by working together with relevant stakeholders over the coming months.

Finally, it is our understanding that government's ToU tariff proposals set out in the consultation relate to the domestic market only. Given the very different nature, variety of customers and nuances of the non-domestic market, Energy UK strongly recommends that government consults separately on any proposals which would apply to non-domestic customers, including microbusiness customers.

11. Do you agree that the Smart Energy Code could provide the appropriate governance for development of common data standards? Please explain your answer.

The current data standards in relation to the format of documenting ToU tariff data form part of SMETS2 and GBCS – subsidiary documents under the Smart Energy Code (SEC). They currently serve a primary purpose of ensuring accuracy of displaying the price of a consumers' energy consumption on Smart Metering Equipment in the home – and Energy UK believes that as this is a key benefit associated with the rollout of smart meters, the SEC remains the appropriate governance vehicle to maintain these.

In terms of an appropriate governance vehicle for facilitating or enabling time of use tariff data being openly available to other market participants, Energy UK has no firm view at present. However, we do support the principle that the governance of common data standards sit with where the primary requirement sits. On one hand, the Retail Energy Code (REC) might be a worthy candidate as this governs wider Retail Market operations, whereas on the other hand, it may be sensible (and more cost effective) to add an additional requirement for electricity suppliers to make this data available to either relevant market participants on request, or to hand the information over to a central source/service

provider that could then disseminate the information on. Additionally, from a technical perspective, it is worth noting that the SEC allows parties who become DCC Users in the Other User category to have access to tariff / price data as configured on smarts meters – notwithstanding the points made in response to Q10 above in relation to the need to have further clarity on the Use Case(s).

12. How should Government ensure that Energy Smart Appliances integrate with time-of-use tariffs, beyond providing interoperability with tariff data?

We do not currently have a strong view on how tariff data integrates with ESAs, but would expect Government to consult broadly, including with ESA manufacturers, to determine the way forward.

Furthermore, from a regulatory perspective, as this is not explicitly covered in the proposals, it is important that there is parity on any potential future regulatory requirements between all industry parties. The proposals seem to consider requirements on Energy Suppliers only, so there is a need to also cover equivalent requirements on the Demand Side Response Service Provider (DSRSP)/ESA Provider to ensure the consumer is protected and that data is not used for unintended purposes or leads to consumer detriment. More broadly, and relevant to all industry parties, we suggest that Government considers an outcomes/principles-based regulation rather than taking a prescriptive approach.

13. Should government consider standardisation of other types of 'incentive data' used by ESAs for DSR? Please consider what types of data and how they could be standardised.

Based on the examples provided, Energy UK currently does not have a strong view on standardisation of other types of incentive data used by ESAs for DSR. We suggest further consultation once Government has engaged with industry to determine other examples of incentive data.

14. Do you agree that Government should establish regulatory requirements to promote adoption of ESA standards, and what would be your preferred approach? Please consider the advantages and disadvantages of an 'approved standards' (Option 1) vs. 'mandated' (Option 2) approach.

Yes, to deliver necessary benefits to the energy system and consumers, Energy UK agrees that regulatory requirements should be established to promote the adoption of ESA standards. Regulatory requirements will ensure this adoption is of the quantity, quality and consistency necessary.

Our preferred approach is Option 1, outcome-based requirements and presumption of conformity through enforcement of approved standards. ESA markets are nascent, yet wide-ranging, competitive and innovative. Outcome-based requirements can tackle objectives, for instance on minimum levels of cyber security where companies have different solutions, but with common end results and outcomes. This approach allows for innovation and competition in solutions whilst avoiding unintended consequences of prescriptive regulations in a nascent market, benefitting manufacturers, service providers and ultimately, consumers.

By contrast, given the pace of change in ESA markets, which themselves are not homogenous, mandating standards 'too early' risks obstructing the evolution of the best deliverable functionality of DSR in each technology as this is simply too hard to anticipate at this stage of development. This is particularly true with regard to the heat pump market which is at a much earlier stage of growth than for EVs and battery technology. Mandated standards risk locking out value and may also obstruct international applicability of products and services which operate across multiple jurisdictions.

With regard to the disadvantages associated with an outcomes-based approach, these can be mitigated through appropriate governance as noted in the consultation itself. Regarding complexity for DSRSPs, service providers already support a wide raft of standards in their products and services and therefore it is possible to support development streams implementing different products developed to different sets of standards. The trade-off comes with increased cost and operation, however, in an outcomes-based model, we believe the market will naturally gravitate towards particular approved standards that are most feasible, i.e. the easiest to adopt, whilst not restricting the existence of those that are not, and therefore not restricting potential for innovation.

The second disadvantage noted, of complexity for DSRSPs risking the consumer experience of interoperability embodies an assurance risk. This may also be mitigated through a combination of the right protocols under appropriate governance, and market enforcement. For instance, maintenance of a central register of approved standards in a common format and a thorough approvals process for these standards including controls, reviews and audits ensures standards are accessible, appropriate and fortified. Indeed, arrangements already exist to provide independent auditing and testing of cybersecurity, for example, in Zigbee SEP, there is an auditing process which uses the ISO 27001 global standard. Then, market enforcement via a body such as the Office of Products Safety and Standards will ensure requirements are being met.

Notwithstanding this, as in our answer to question 9, outcomes are difficult to specify and should be established through sufficient industry engagement, regardless of which approach to meeting these outcomes is required. All additional requirements placed on ESAs inevitably place an increased cost to the unit, the impact of which needs to be assessed as part of a full cost-benefit analysis.

Standards can be monitored as they develop and the option to mandate can be kept under review.

15. Do you agree that a standard based on PAS 1878 should be used in the future regulation of ESAs?

Energy UK agrees that the standard should be based on PAS 1878 for ease and efficiency with no other suitable alternative at present. However, we strongly urge government to appropriately engage with industry on the following considerations, before which, PAS 1878 is not fit for purpose.

Firstly, we note the omission of PAS 1879 from consideration in this consultation. Given that PAS 1879 details operation of products in delivering flexibility and is intrinsically linked to PAS 1878, it should also be in scope for industry review.

Regarding PAS 1878 itself, overall the standard was principally designed to support EV charging, which foremost represents larger blocks of predictable load, and therefore at present is not best aligned to equal operation of other ESAs such as heat pumps. Without cross-ESA understanding, ultimately the standards will deliver sub-optimal value to consumers. Similarly, the ESA consumption forecasts are assumed to be discrete as they do not enable a combined ESA forecast, i.e. EV and heat pump profile to be offered. The standard also does not directly address and is therefore unclear on how a Customer Energy Manager (CEM) may enable cross asset optimisation, whilst the main focus of the standards is on assuming most of the intelligence resides at device (ESA) level.

Areas which require greater clarity within PAS 1878 itself include its certification process and registration of firmware. Likewise, reporting requirements for flexible response are unclear, i.e. in guaranteeing actions were not co-incidental, and standards introduce long tail commitments which are onerous, e.g. the commitment to provide software updates for devices over a 15 year asset life.

Furthermore, under PAS 1878 the CEM cannot assign weighting to DSRSP offers, e.g. decide whether it is better to opt in to a DSRSP offer or respond to a ToU tariff signal, nor can the DSRSP communicate the specifics of the problem it is trying to solve.

Finally, for PAS-based standards to remain effective, there must be an appropriately fast and cost-efficient mechanism by which they can evolve. We note the BSI's Flex Standards model for consideration which enables ongoing changes and dynamic consensus which allows standards to better keep pace with tech developments.

We recommend that Government convene industry working groups with all relevant stakeholders to review PAS 1878 and 1879 to make them fit for purpose.

16. Do you agree that Government proposals for ESA standards should apply to domestic-scale ESAs with the highest potential for flexibility, including private EV charge points, batteries, heat pumps, storage heaters and heat batteries? Please consider whether any other types of ESA should be in scope.

Yes, to align policy and ensure all users of ESAs have equal opportunity to access the benefits that come with DSR, Energy UK agrees that such standards should apply to all ESAs identified above.

Energy UK welcomes the inclusion of the heat pump element of hybrid heating systems within scope of these standards. In order to safeguard consumer experience of hybrid systems, it would be welcome to devise a specific standard relating to this system in line with the advice from the Climate Change Committee whereby 'hybrid heat pumps can operate in heat pump mode up to 80% of the time'. Given this interaction, extra consideration is needed for how the standard will apply to this system.

17. What is your preferred option for developing and maintaining ESA standards in the future? Are there other options we should be considering? Please explain how you would expect your preferred option working in practice.

Energy UK proposes that a hybrid approach be used for developing and delivering future ESA standards, combining options 1 and 2.

An existing standards body such as the BSI is best to develop standards with pace and ease, aligning with international standards and WTO requirements. We note that the BSI was used to successfully develop PAS 1878. Accompanying this, a special purpose industry group should be given explicit mandate to coordinate and provide the standards body with an industry steer. This is especially important given that the ESA market is rapidly changing and dynamic, therefore any standards should always be developed through close collaboration with all relevant stakeholders.

In particular, the BSI alone is more suitable to developing manufacturing standards, whereas due to the breadth of DSR applicability, and that the definition and reality of the service is not yet fully known and can/should change to realise full potential, direct industry mandate is necessary. Furthermore, the BSI also lacks remit over settlements arrangements and in protecting the consumer and ultimately ensuring the number on their bill is correct. Therefore specialist industry knowledge is required to triage how import, export, metering and technology considerations all flow to the consumer. There are simply too many retail market considerations relevant to consumer protection that do not sit under the BSI. Again, we note the suitability of the REC over the SEC, due to it dealing with competitive aspects of the retail energy market, not limited to energy supply.

18. Should Government mandate a randomised delay for ESAs, including heat pumps, storage heaters, heat batteries and batteries, to mitigate against risks to grid stability, in advance of longer-term ESA standards? Views are welcome on how a randomised delay could operate and on alternative mitigations.

Energy UK recognises the rationale for a randomised delay function in the identified ESAs to mitigate against short terms risks to grid stability and agree with mandating of this requirement. However, several considerations should be addressed and worked through to ensure appropriate implementation and delivery.

Firstly, we strongly recommend that government and industry both learn from the experience of implementing smart standards for EV charging via the Electric Vehicles Smart Chargepoints Regulations 2021, in that lead time for any additional feature is discussed prior to finalising an implementation date. With suppliers purchasing software from developers and manufacturers, engagement with all such stakeholders should be coordinated early on.

We suggest that Government consult the ESO on what period of randomisation is absolutely necessary and use this evidence base to drive the delay requirement. It is important that BEIS also engage with DNOs and networks in order to determine the scale of the delay, and the impact of randomness on delivery of flexibility programmes. Consideration should be given to whether and how much this feature, operating across multiple ESAs within a consumer home, interferes with an aggregator's ability to bid into flexibility markets. Similarly, the need to ensure the consumer home remains within the parameter of heat comfort levels given the delay between a heat pump being turned on and the room temperature being brought up to a certain level should also drive the delay period.

It is also important that Government compare the level of existing randomness affected by environmental and behavioural factors in the usage of ESAs. The policy development process would benefit from additional mapping of scenarios by Government in which randomisation is important, such as appliances turning back on following outages. The objective would be to determine whether randomised delay would lead to greater synchronisation of heat pumps compared to the impact of existing diversity factors.

The above mapping exercise should also take into consideration future challenges on a broader system level, including the robustness of the system and how technology might evolve to respond to price signals or load capacity signals in the future.

With regard to implementation of a randomisation feature, stakeholder engagement is required on how the this will be delivered, i.e. at device or network level and how compliance and enforcement are managed. The interaction between smart tariffs and randomisation should also be considered, to ensure that consumers are charged the correct rates. The longer the length of the randomised delay period, the more likely the impact on access to more competitive and dynamic ToU tariffs. Consumers are currently able to override the randomised delay function on EV charge points, and the same should apply to heating appliances given that these products may be sold as part of a contract that includes ToU tariffs.

Lastly, additional detail is needed as to whether the randomised delay would also apply to when heat pumps are being switched off, and whether there may be safety risks connected to this, for instance in case of fire. The relevant Government Working Group reviewing this aspect of the proposals should consider these points, including the risk to the grid of a sudden drop in load. One solution could include a manual override function that allows the consumer to make instant changes.

Regarding batteries and solar PV, it is important that this policy framework recognise that not all ESAs will behave in the same way and have different levels of diversity factors, for example the use of heat pumps in the colder months.

19. Should minimum device-level cyber security requirements be implemented for heat pumps, storage heaters, heat batteries and batteries, prior to implementation of enduring ESA standards? Should any other ESAs be considered?

Yes, to protect consumer confidence in ESAs and DSR in the immediate term, Energy UK agrees that minimum device-level cyber security requirements should be implemented prior to more enduring standards.

However, the requirement for device-level cyber security should only seek to mitigate the risks determined by a Government-convened impact assessment, and the associated costs of mitigating these risks should be proportionate to the potential financial impact of each risk. Further to this, the requirements should be principle-based and therefore sufficiently flexible to enable the provision of market-led solutions that deliver better outcomes for consumers and the energy system. We point to the effective cyber security protections that have been delivered in finance, telecoms and energy without having prescribed single end-to-end solutions which can be learnt from.

A principles-based approach also supports more resilient outcomes. This is because different cyber-security approaches reduce the likelihood of a security compromise affecting the whole network of ESAs.

20. Is ETSI 303 645 an appropriate standard for minimum device-level cyber security requirements for ESAs?

The use of ETSI is acceptable but it must be proportionate for a broader range of devices. The timeline for implementation must also ensure that there is a significant period of time between the publication of the detailed guidance and the introduction of the standard. This is because developers and manufacturers require the detailed guidance, not just the legislation, in order to ensure that they are compliant with the policy.

In terms of applying the cyber security requirement, the policy development process must take into consideration not only smart devices but also Home Energy Management Systems (HEMS) and their development on an international market. The policy framework must allow for the development of smart applying to both options.

21. Do you agree that common systems could be required to mitigate system-wide risks? What issues will need to be considered in the design of such systems?

Overall, without further detail on exactly what such common systems would entail, we cannot comment on whether they are appropriate. We strongly urge government and the NCSC to work closely with industry when informing these requirements with considerations below to note.

Our understanding on a common system for PKI architecture is that a single PKI service provider will provide the necessary certificates. Similar to the DCC's architecture, at a high level this system may be appropriate, but only with the strict caveat that it does not stifle innovation. To mitigate this risk, the single PKI architecture must be capable of dealing with multiple parties operating in the market, and be flexible to cope with innovation and commercial developments as the market matures.

An alternative and more flexible approach such as a central body acting as a root certificate authority (CA) with multiple entities authorised by the central body to act as sub-CAs warrants review by NCSC and industry. Such alternative approaches create resilience to poor governance at the root level and therefore provide a more innovative and competitive landscape that will ultimately lower costs for the end consumer. An example of such an approach is the Open Connectivity Foundation (OCF) which developed a single PKI with two competitively operated roots licensed/approved by the OCF. The OCF also offers compliance testing and other services to support the Foundation.

With regard to a common system for anomaly detection, without a clear definition of what anomaly detection embodies, we cannot comment on whether this is appropriate.

Finally, a common system implies a significant level of agreement needed when changing or evolving rules of, or changes to the system. Many of our members have noted that their current view of governance arrangements for smart meters (encompassed within the Smart Energy Code) is that it they are both cumbersome to navigate, and are unlikely to accommodate the (speed of) innovation expected in

this market. It will also be important for government to consider how any common system/s are established contractually, avoiding the use of system providers that have complicated multi-party components that is likely to result in creating a lengthy process to implement change, often at a high financial cost.

22. What issues will Government need to consider when reaching a decision on delivery approach for common systems?

As noted in our response to Question 21 above, Government must learn from and evaluate the experience of the smart meter rollout, whereby the use of multiple service providers to deliver a system has clearly added significant complication due to the need to maintain, update and make changes across a number of sub-systems of a much wider infrastructure.

All updates/changes as a result of regular and routine maintenance, or changes/updates needed to address defects, and changes requested by Users of the infrastructure all need to be tested against each other, both initially (prior to go-live), and each time any changes are made once the service is live. This model has added significant cost to both implementation and ongoing operation for both the central service provider, and service users, all of which will ultimately be passed on to end-users.

In carrying out the essential cost benefit analysis (CBA) in this area, Government must ensure that the CBA takes account of the quantifiable costs throughout the assumed lifetime of any common infrastructure or systems. This will demonstrate that the true costs (on all key parties) and benefits of innovation have been considered as part of any decision-making process associated with the need (or not) for common systems or infrastructure.

Questions detailed in consultation Chapter 5 "Energy smart appliances: Delivery frameworks"

23. What are the key considerations for design of governance during the development, transition and delivery phases of implementation?

Energy UK suggests governance arrangements be designed to ensure the following criteria are met:

- Market-led where possible
- Streamlined arrangements which are not unduly complex
- Built in a way which optimises industry resource (not overly burdensome or bureaucratic)
- Independent leadership
- Cost efficient
- Encourages representation with the right level of expertise and seniority
- Regular external review to ensure arrangements remain fit for purpose
- Effective use of working groups to take forward aspects of development in a meaningful and efficient way.

Finally, given the range of non-traditional players in this sphere as well as the pace of change in DSR, it is essential that this framework is flexible and easy to adapt. Therefore, Energy UK stresses that the SEC is simply not the appropriate governance vehicle for these phases of implementation.

24. Are there any considerations Government has not mentioned that should be factored into future policy on assurance? Please consider assurance for devices and associated systems, such as 'cloud' platforms.

Please see member responses.

Regardless of the type of assurance agreed, Energy UK believes the key point is that assurance is mandated to ensure market-wide participation. An optional requirement on assurance could lead to inconsistent standards and costs falling on some industry participants and not others, compromising fairness.

Government should also consider where this sits best in regulation, i.e. Ofgem, OPSS or other.

25. What is your preferred approach for assurance for ESAs, and why? Please provide any evidence on the relative impacts, costs, and benefits of different approaches.

Following our answer to Q24, Energy UK will fully comment on proposals at the next phase of policy development.

26. Do you think a labelling scheme for ESAs could help promote consumer uptake in DSR from ESAs? If yes, what type and form of labelling would be most beneficial?

Again, we support such a scheme in principle to drive consistency, but await the next phase of policy development.

27. What factors should government take account of when considering how the costs of delivering these arrangements should be distributed and recovered?

Please see member responses.

Questions detailed in consultation Chapter 6 "Smart Electric Heating"

28. Do you agree that the smart mandate should initially apply only to hydronic heat pumps, electric storage heaters and heat batteries? Please explain your answer.

Energy UK supports a market-based approach that provides a level playing field for low carbon heating technologies. Therefore the mandate should apply to all new low carbon heating technologies being installed in single dwellings. All assets should be treated the same, as they will all play an important role in the transition. As there are likely to be many ESA's in the home managing different operations, all

devices should be able to work alongside other devices in the home without impacting performance or functionality.

29. Do you have a view, and supporting evidence, on which appliances the mandate should be extended to include in the future, and by when?

As in our answer to Q16, Energy UK supports the mandate applying to all low-carbon heating technologies, utilising this principle as opposed to an exhaustive list, to ensure a level playing field that enables the market to deliver the most optimal outcomes for consumers.

We again welcome the inclusion of hybrid heat pumps, and would welcome a specific standard relating to this system in line with the advice from the Climate Change Committee whereby 'hybrid heat pumps can operate in heat pump mode up to 80% of the time'.

While this may be out of scope of this consultation, there is a risk that this standard will introduce requirements for communication and connectivity without a baseline requirement for how the heating appliance should operate on a very basic level, in the form of a product control standard. Where heat pumps are, for example, cycling and not operating efficiently, the scope for consumers benefiting from flexibility is greatly diminished.

30. Do you have a view, and supporting evidence, on the impact that the proposed mandate may have on different consumer groups, for example low income and vulnerable consumers, in terms of upfront costs, running costs or otherwise? What further action is needed to ensure all groups can benefit from smart heating?

Engaging consumer groups in benefitting from the potential value of a smart device is a significant challenge, and parallels can be drawn from consumer engagement regarding the transition to electric heating and smart meter installation in terms of the personal benefits, and the contribution to achieving Net Zero.

In their report 'Boiler Alert', the Social Market Foundation identified specific challenges with upgrading homes across different tenures with smart meters or low-carbon heating. For example, in the social housing sector, when social landlords were engaging tenants in plans to transition homes to low-carbon heating technologies, one respondent was quoted as saying: 'we struggle to 'convert' many tenants […] some are unwilling to accept that the work needs to be done despite not needing to pay for it. Some reasons are rational e.g. people afraid of the cost of the systems. Some are irrational: people do not like change, simply put.' Where owner-occupiers can benefit from the lower energy bills and higher property values following the installation of low-carbon heating technology, in the private rented sector, the report identifies 'a less direct relationship between investment and returns' for private landlords. It is therefore essential that the value of a smart heating system is communicated effectively to consumer groups, and tailored to their tenancy.

Particular consideration is needed for consumer groups that have had difficulties engaging with the smart meter roll out, as the same challenges may apply here. This could include accessibility, and therefore accessible display units should be considered when defining the standards of the interface.

There are also a number of unresolved issues, including:

- How can consumers consent to the use of smart devices in privately rented properties? And can the device be switched on and off depending on each tenants' preferences?
- What is the impact for consumers living in properties with smart-enabled communal heating sources?
- Customers in low-income groups are traditionally less likely to switch supplier even though they could gain financial benefit. Similarly, they may be less likely to use smart heating devices and therefore miss opportunity to benefit.

https://www.theccc.org.uk/wp-content/uploads/2020/12/Policies-for-the-Sixth-Carbon-Budget-and-Net-Zero.pdf (page 78)
https://www.smf.co.uk/wp-content/uploads/2020/10/Boiler-alert-Nov-2020.pdf

31. Do you agree with the proposed definition and approach to delivering smart functionality for electric heating appliances? Please explain your answer. If proposing additional requirements to include in the definition, please provide evidence on the costs and benefits of such requirements.

Energy UK supports the outcomes-led approach set out in this consultation, in particular the references to the device being communications-enabled, and capable of responding automatically to incentive signals. In addition, Energy UK would support the inclusion of a reference to a digital interface for the consumer, the enabling of performance monitoring capabilities, and internet connectivity.

32. Do you agree with the proposal to implement the smart heating mandate from 2025? Please explain your answer.

Yes.

It is important to consider the interaction between the smart mandate and the forthcoming Market Based Mechanism (MBM) for low carbon heat. Given the intention for the MBM to be in effect one year in advance of the introduction of the smart mandate, there is a risk of 'dumb' heat pumps being sold at significant volume which will generator poor outcomes for consumers who will not benefit from the smart capabilities and protections set out in this consultation.

33. Do you have a view on what other measures could be taken, in addition to the proposals in this consultation, to ensure heat pumps can provide this flexibility, for example a minimum level of thermal storage?

Energy UK does not support the introduction of a minimum level of thermal storage as flexibility for heat pumps is not contingent on access to thermal storage. Heat pumps themselves are able to deliver flexibility based on leveraging the thermal inertia of the home, via pre-heating. This should therefore not be in scope of this consultation. Government should consider the link between the proposals in this consultation, and the need to improve the fabric efficiency of housing in order to ensure that they are able to host electric heating appliances. Recommendations set out in the Construction Leadership Council's

National Retrofit Strategy make reference to the pressing need to upgrade the energy efficiency of existing buildings, to meet a range of objectives, including the ability to host low carbon heating technologies.

34. Should Government consider introducing a 'smart mandate' for domestic-scale battery systems or any other appliances? If so, what appliances and why?

Energy UK would support the inclusion of a smart mandate for domestic-scale battery systems.

Questions detailed in consultation Chapter 7 "Regulation of organisations"

35. Do you agree that licensing should initially focus on organisations providing DSR for domestic and small non-domestic consumers? Should there be any exemptions to these requirements? If so, why?

Please see member responses for this section.

36. Do you have initial views on how a licensing scheme should be implemented – for instance, should it be linked to providers of services relating to specific products, linked to the size of the consumer, or some other approach?

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37. What design principles do you agree or disagree with? What principles would you like to be added?

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38. How should proportionality be delivered in a future licensing framework?

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39. What additional protections for consumers could be required from a future licensing framework beyond those contained in existing consumer protection law?

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40. Are additional data privacy protections required for DSR beyond those existing in law through the General Data Protection Regulation? If so, what additional measures should be introduced and why?

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41. Do you think that licensing requirements could be appropriate to manage cyber security risk in future, alongside the device level and (for the largest load controllers) NIS measures outlined elsewhere in this consultation? Please explain your answer.

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42. Do you agree that licences should contain conditions to ensure that organisations are not able to use their market position to hinder consumer switching or undermine delivery of Government's objectives for interoperable energy smart appliances?

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43. Do you agree that licence conditions may be a useful tool to help mitigate risks to grid stability alongside the measures outlined elsewhere in this consultation? What licence conditions may be necessary to achieve this?

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Questions detailed in consultation Chapter 8 “Next steps”

44. Are there other risks to grid stability or cyber security from other forms of load control that are not covered by the proposals in this consultation? If so, how significant are these and how should they be mitigated?

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Analytical Annex Questions

1. Do you agree with the case for intervention and the market failures we have identified. Are there any points we have missed?

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2. What is your assessment of the current state of the DSR and ESA markets? What firms are operating in these markets, what products and services are being offered, and for example, to what extent are firms in the electric heating market already offering smart options?

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3. How do stakeholders anticipate the DSR and ESA markets will grow to 2050? We would be interested in views on changes in types of firms in the market, their sizes and business models, and speed of market growth.

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4. Do you agree with the benefits of DSR we've identified and how do you see these changing over time?

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5. Given the challenges of measuring the benefits of cyber security, due to under reporting breaches, uncertainty of scale, and far-reaching impacts, as discussed in the 2018 NIS impact assessment, how do we best quantify the benefits of additional cyber security?

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6. Are the costs and benefits identified for ESA manufacturers (e.g., smart heat pumps or smart white goods) accurately specified? Are there any we've missed, or not accurately specified?

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7. For firms in scope of the licence proposals, what type of costs and benefits might be incurred from these proposals?

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8. For larger load controllers, in scope of the NIS extension proposal, are the costs and benefits identified appropriate? Are there any we have missed, or not accurately specified? For example, what is your current level of cyber security spending, and what

additional spending would you anticipate in using the CAF to comply with NIS? Are you able to separate costs into categories, such as familiarisation, compliance reporting and incident reporting, or any others?

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9. For all load controllers, how much do organisations consider the risk from a cyber-attack on their activities of impact to the wider energy system?

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10. Are the costs and benefits identified for energy suppliers appropriate? Are there any we have missed, or not accurately specified?

    Click here to enter text.

11. Are the costs and benefits identified for consumers appropriate? Are there any we have missed, or not accurately specified?

    Click here to enter text.

12. Do you have a view, and supporting evidence, on the impact of the proposals on different consumer groups, for example low income and vulnerable consumers? What further action is needed to ensure all groups can benefit?

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This consultation is available from: www.gov.uk/government/consultations/delivering-a-smart-and-secure-electricity-system-the-interoperability-and-cyber-security-of-energy-smart-appliances-and-remote-load-control

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