Document title

Alfen ICU's responses to BEIS and Ofgem's call for evidence on a Smart, Flexible Energy System

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Completed by

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Company details

Company name:	Alfen ICU B.V. ("ICU Charging Equipment")
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Company background

Alfen B.V. was founded in 1937. Its core business is the manufacture of transformer substations for the Dutch market where it has an 80% market share.

In 2010 it started its activities in large-scale battery storage which it launched commercially in 2016 in the Benelux and is now doing so also in the UK.

In 2008 it set up "ICU Charging Equipment" which produces 'solid smartware' charge points for electric vehicles and the associated services and systems.

Alfen ICU B.V. set up an office in the UK in October 2015. Its activities since then have focussed on the EV charging side of the business, although the focus on the battery storage side of the business is now increasing.

Overview of responses

Alfen ICU broadly welcomes this call for evidence and the intended move to a smart, flexible energy system, particularly one which encourages - or at least brings clarity and creates a level playing field - for storage in terms of e.g. planning, regulation,

connections, costs, etc. and encourages smart EV charging which is integrated within the energy system.

As Alfen ICU is only just initiating commercial activity in the UK with regards to storage, it is still familiarising itself with the realities of the UK electricity market. Accordingly the related responses below are confined to a limited number of questions and are brief in nature.

With more experience of the EV charging market (in the UK), responses have also been given to those related questions.

In addition, Alfen ICU supports the thinking behind the response to this call for evidence from RegenSW, particularly with regards to storage.

Responses

3. Have we identified and correctly assessed the issues regarding storage and network charging?

We would make the following comments:

- We concur that storage can based be classified as 'non-intermittent' on the basis that it mitigates the intermittency of other (renewable) generators.
- Storage being liable for network charges for both import and export would only make sense if this is offset against the value they bring in terms of avoided network reinforcement.
- We fail to understand the logic behind BSUOS being higher for storage than for generation DSR.
- We concur that the double counting of electricity used by storage (when this electricity is exported and used a second time) is not reasonable.
- We also think that storage being liable for the Climate Change Levy is unreasonable, as storage is a key facilitator to the decarbonisation of the energy system as it encourages optimal use of (intermittent) renewable energy generation.

4. Do you agree with our assessment that network operators could use storage to support their networks?

Are there sufficient existing safeguards to enable the development of a competitive market for storage?

Are there any circumstances in which network companies should own storage?

We certainly agree that network operators could use storage to support their networks. A key element to accelerate the adoption of storage within the energy system is that all possible revenue channels are open to grid-connected storage. If a DNO owns storage but is enable to benefit from all potential revenue streams, e.g. ancillary services or trading on the wholesale market, it significantly undermines the business case of owning that asset.

We are aware of the delicate balance of roles and responsibilities in the energy system and appreciate facilitating this would not be straightforward but we would urge efforts to come to a resolution in this regard. Such a resolution might enable co-ownership of a storage asset between a network operator and a commercial operator such as an aggregator. Ownership could possibly, for example, be split as a percentage of the capital expenditure on the asset, or a kind of lease ownership could be facilitated, where 3rd parties have use of a certain percentage of the capacity of that asset at given times.

Related to that – and as a slight aside - we feel that large-/grid-scale battery storage should be encouraged more than domestic storage due to the increased efficiencies both in terms of the economies of scale and in terms of the additional value of the associated balancing services. A homeowner would have more value in leasing a portion of a large storage asset rather than installing a small domestic battery of the equivalent capacity at his home.

5. Do you agree with our assessment of the regulatory approaches available to provide greater clarity for storage?

In terms of our preference for the proposed approaches for regulatory treatment of storage (point 38), ultimately we would prefer option d, but see that in the interests of a swift improvement to the current situation, option b would probably be most preferable, potentially followed by option c.

We also think that the requirement for planning permission for storage with capacity above 50MW is not unreasonable, but believe that there is a case for basing the requirements for planning permission on the nature and (physical) size of the asset

rather than its capacity for power generation. (Energy density of batteries is increasing, so potentially in the decades to come a 50MW battery storage facility could be the same physical size as a 5MW battery storage today).

15. To what extent do you believe Government and Ofgem should play a role in promoting smart tariffs or enabling new business models in this area?

We feel that the Government and Ofgem can play an important role to highlight the benefits of flexibility to end users in a compelling manner. This would ideally involve both working with suppliers to ensure coherent messaging to their customers as well as leading a direct campaign to the wider public.

In terms of supporting business models, support would just be required to put in place a system which supports smart tariffs, e.g. with smart metres, as quickly as possible.

17. What relevant evidence is there from other countries that we should take into account when considering how to encourage the development of smart tariffs?

In the Netherlands there have been a number of projects around smart energy such as:

- **Flex Charging**: an EV project Alfen ICU is involved with in conjunction with EVNet.nl where charging speeds are reduced at peak times (in return for a lower price).
- **Social Charging**: an EV project Alfen ICU is involved with in The Hague where users can input their time of departure and distance of their next journey into an app and the systems schedules the charging accordingly.
- **Smart Grid in Balans**: a project which Alfen ICU is involved in where charging speed of certain public chargers is reduced depending on the availability of locally produced renewable energy. Participants have the option to override this for an additional price.
- **Jouw Energie Moment**: this was a project run by the grid company 'Enexis' with domestic solar panels and a 'smart' washing machine. A key finding from this project was that, if it doesn't inconvenience them, users are prepared to change the timing of their energy consumption based on financial incentives regardless of the size of those financial incentives.
- **Logical allocation / Delayed charging**: also run by the grid company Enexis this was a project where EVs of participants plugging into public chargers in a certain region in the course of the afternoon would only start charging at midnight but in return for a lower price per kWh. Participants had the option to override

this setting and start charging immediately – and pay a few extra Euro cents per kWh - but in practice this functionality was hardly ever used.

In addition the grid company Alliander has been running a number of smart grid projects including one in Groningen and one in Heerhugowaard. We have little insight into these projects currently but as Alliander is one of our larger customers, we could potentially find out more or facilitate an introduction.

19. Are distribution charges currently acting as a barrier to the development of a more flexible system?

Yes, we agree that current DUoS chargers do not necessarily reflect the cost of usage of the network by importers/exporters of energy, nor that they reflect the value which storage brings to the grid. We therefore would welcome a move to smart distribution tariffs.

28. Do you agree with the 4 principles for smart appliances set out above (interoperability, data privacy, grid security, energy consumption)?

Yes. Regarding interoperability and using open standards, we would stress that this needs to be guaranteed throughout the whole chain of any associated system. For example, a smart appliance might be connected to a manufacturer's back-end via a given open standard, but potentially this back-end should also be able to interface with other systems (e.g. from the grid company or energy supplier) based on open standards.

29. What evidence do you have in favour of or against any of the options set out to incentivise/ensure that these principles are followed?

We would support Option C: *Require appliances to be smart*, at least for EV chargers. The experience in the domestic charging market shows that consumers purchase their charger based largely on price and are not prepared to pay the premium for a smart charger given the choice. Potentially there is a solution whereby chargers greater than a certain capacity, e.g. 3kW, need to be smart.

33. How might Government and industry best engage electric vehicle users to promote smart charging for system benefit?

EV users will be more likely to smart charge if:

- There is a financial benefit e.g. flexible tariffs, or 'EV owner' tariff (e.g. a discount on kWh price if you own an EV)..

- They can do so in combination with the production of (locally produced) renewable energy.
- They are able to charge faster, e.g. if chargers are required by law to be smart above a certain capacity.

Equally EV users need to be educated about the benefits of smart charging:

- The government can provide more information to (potential) EV users about the benefits of smart charging, e.g. via the Go Ultra Low site.
- Industry – both energy suppliers and automotive manufacturers – have a role to play in educating their customers. Government also has a role to encourage this, although we feel that given the right regulatory framework and systems (see above), energy suppliers at least should be incentivised to promote smart charging for their own commercial benefit.
- As a longer term more far-reaching approach we would certainly advocate including the basic workings of the energy system in the national curriculum.

34. What barriers are there for vehicle and electricity system participants (e.g. vehicle manufacturers, aggregators, energy suppliers, network and system operators) to develop consumer propositions for the:
(i) control or shift of electricity consumption during vehicle charging;

There are a number of barriers, or at least elements which need to be considered / investigated:

- **Customer acceptance**: to what extent, based on what conditions and with what incentives will an EV user give control of the timing of their EV charging over to a third party. In any case we think it important that EV users have ultimate control over their charging times, e.g. by having the possibility to override previously agreed settings, even if this might incur financial consequences.
- **Interoperability**: as above interoperability on the basis of (international) open standards needs to be assured. With the Open Charge Point Protocol, the Open Smart Charging Protocol and the Mode 3 protocol this does not need to be an issue.
- **Communications uptime**: the reliability of the communications between the charger and the related systems will be important to ensure the ability to smart charge. This can still be mitigated by having default charging profiles in case communication is lost. Also the impact of one charger not responding to a smart charging signal will diminish as volumes grow.

- **Energy suppliers**: energy suppliers need to at least offer an ‘EV tariff’ (some are already), ie. a discount on the electricity supplied to customers with an EV. In principle, this is simple, but still requires time to set up and administer.
  If suppliers want to offer flexible tariffs they need to install smart metres and develop the associated systems and offerings which will require significant effort.
- **Capacity thresholds and volumes**: energy market parties such as balance responsible parties or aggregators are still reluctant to take on EV charging networks in their portfolios, partly because of the above reasons, partly because the volumes are too low to constitute sufficient capacity.

(ii) utilisation of an electric vehicle battery for putting electricity back into homes, businesses or the network?

There are a number of barriers to this, all surmountable, but this will take time:

- **Standardisation**: currently the Chademo charging standard facilitates V2X charging but this is only supported by some car manufacturers and only by the very small number of rapid chargers as a percentage of the entire install base of chargers.
  The seemingly de facto standard which potentially will support V2X on a large scale is the IEC15118 standard. (This standard also supports identification of the vehicle when plugged in as well as the state of charge of the battery, both of which would also facilitate smart charging.)
  This standard still needs to be adopted by the automotive manufacturers as well by the charge point manufacturers.
- **Product development**: in addition to standardisation, both automotive manufacturers and charge point manufacturers need to develop products which support bi-directional charging. In principle, this is not technically difficult but needs to be supported by a business case.
- **Business case**: the business case for V2X will be driven on the revenue side by the feed-in tariff for feeding energy from an EV into the grid/home. If this can be optimised, e.g. by having a flexible tariff depending on the (local) balance of energy supply and demand, this could potentially help.
  On the cost side, there will be extra costs for both the EV and the charge point due to the additional functionality required.