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FOR WHAT COMES NEXT

BEIS Consultation on Reforming Climate Change Agreements

Response from the UK's Data Centre Sector

March 2022

Introduction and Context

The current CCA scheme was extended in 2020 to incorporate the 2021-2022 target period (TP5) and extend the discount on the Climate Change Levy until March 2025. In 2019 BEIS undertook a review of the effectiveness of CCAs in meeting their policy objectives (of reducing energy use and addressing overseas competition issues). The conclusions were that CCAs met these objectives, but that 'cost-effectiveness' could be improved; the scheme could include only sectors that are trade and energy intensive, and targets should be suitably challenging. The purpose of this consultation is to seek views on how the CCA scheme could be reformed to meet BEIS' strategic intent for the policy mechanism. A more detailed consultation on proposed scheme design is expected later in 2022.

What are data centres?

Data centres[i] are highly resilient facilities that underpin our modern economy by processing, storing and transacting digital data and, with communications networks, form our core digital infrastructure[ii]. Besides underpinning all online activity, data centres enable retailers and banks to process payments, supermarkets to supply, delivery companies to manage logistics and public authorities to deliver services. Some sites are deemed CNI (critical national infrastructure) to reflect the activity managed therein.

Data centres underpin an internet economy that contributes over 16% of domestic output, 10% of employment and 24% of total UK exports and is growing faster than any other in the G-20. Our sector provides the technical infrastructure for financial services, aerospace, transport, healthcare, retail and utilities. Each new data centre contributes between £397 M and £436 M GVA per year to the UK economy while that of each existing data centre is estimated to lie between £291 M and £320 M per annum[iii].

Data centres may be "in-house", supporting an organisation's activity (eg a council or business may run its own data centres). These are known as 'Enterprise'. Or organisations can place their servers in data centres managed by specialist companies that provides space for multiple customers. These are "Colocation" sites. The CCA currently run by techUK is for data centre operators providing colocation services.

What has the CCA done for the UK Data Centre Sector?

The CCA has been a successful policy measure for data centres, improving investor confidence, stimulating efficiency improvements and providing invaluable data on the energy used by the UK's commercial sector.

In terms of efficiency, the requirement to measure and report energy consumption in a robust, consistent and auditable way has raised the standard of energy monitoring. PUE[iv] is now measured more consistently and appropriately. This has improved transparency and has given us a better understanding of the way the sector uses energy. The aggregate figures provide invaluable insight into sector energy demand and CCAs are the only UK policy instrument that collects site level energy data sector by sector.

In terms of financial benefits, the scheme provides much needed relief from some of the more punitive non commodity costs currently added to the price of electricity. The UK data centre sector continues to need strong signals of support because it is very energy intensive, highly vulnerable to overseas competition due to the mobility of digital data, and critically important to the UK economy.

Responses to Questions

1 What are your views on the proposal to follow the current CCA scheme with a new, reformed CCA scheme?

In the absence of a much-needed and fundamental reform of the energy market in the UK we welcome the intention to continue the CCA scheme, we take the view that CCAs have been effective and that the scheme can be adapted for the future. However, we believe that reform should work both ways; for instance, BEIS needs to develop a much better understanding of business realities within the sectors for which it develops policy – see our observations below.

2 What is your view on the appropriate length for a new scheme?

Within the commercial colocation data centre sector, the easy actions with short ROI have been done and low hanging fruit has long been gathered in. The remaining opportunities tend to have significantly higher capex, be more operationally disruptive and have much longer ROIs. Encouraging large scale expenditure is best achieved within a stable policy environment, therefore at least ten years would be considered best.

3 What would be the appropriate length for target periods?

Currently the target periods are two years in length. We would suggest this as a minimum, and in view of our answers to point 2 above, longer target periods would better suit the scale of project that operators are likely to be undertaking and are less likely to penalise operators if the energy saving profile is stepped rather than smooth as a result of the nature of major projects. Longer ROI horizons would also encourage early adoption of larger projects and remove the potential for perverse incentives.

While other schemes are annual and shortening the target periods would make the CCA more consistent in a cosmetic sense, two-yearly cycles were originally introduced to reflect the period needed to implement energy reduction projects and this has not changed. If anything, the horizon has lengthened.

4 When a mid-scheme review is undertaken, what aspects of the scheme do you think should be under evaluation?

The mid-scheme review has been used to look at progress against targets to make sure they were 'challenging enough' and the buy-out price. In the first CCA they also considered small rules amendments. Understanding how a sector is performing against its targets is needed for both government and the sector. Previously the government used performance vs target as a proxy for changing it to become harder only, instead, the review should look at the assumptions made behind the target negotiations to make sure they remain valid and not become fixated on performance which can be quicker or slower than anticipated. So we support a mid term review provided it works both ways. Moreover, if rules change significantly in a reformed CCA then there should also be scope for a review of the rules to ensure they are fit for purpose.

5 Do you agree with the proposal to review sector and facility eligibility for any future CCA scheme?

Data centres are one of the most recent sectors to have demonstrated eligibility under the energy intensity metric and we are not sure why this needs to be revisited. The data centre sector is among the most energy intensive industry sectors in the UK and data is the most mobile commodity on earth, so the sector continues to be vulnerable to offshoring and carbon leakage. Data centres provide core digital infrastructure which is critical to the UK's current and future economic wellbeing. It is therefore essential that reforms to eligibility should enable continued support for this critically important sector.

6 Do you agree that energy intensity and trade intensity metrics should be used as part of this criteria?

No. Other government schemes often have difficulty in proving trade intensity and we do not believe that reformed criteria should require sectors to meet both energy and trade intensity criteria. It is impossible to prove trade intensity for sectors like data centres where no physical products are handled. Nevertheless the data centre sector is at risk of carbon leakage due to the ease at which data can be transported, processed and stored in different countries. However, government struggles to represent this statistically.

7 What are your views of the options for measuring trade openness (trade intensity and import penetration ratio) and which do you believe would be most appropriate for determining scheme eligibility?

We do not believe that such a metric exists. Appropriate metrics have to be developed to recognise that the data centre sector does not handle visible and tangible products with stated worth. The sector handles electronic data which is very transportable across country boundaries.

8 Are there any specific considerations you believe should be made in reviewing existing process definitions?

Government want to review the energy/trade intensity of existing processes, and how they define what processes are covered if a sector or activity is deemed to be eligible. The process definition for the data centre sector is a mixture of an activity and business model; the activity is processing and storage of electronic data but only when it is the primary business model for the company to provide colocation services; hence the data stored is not their own. This seems unique in CCAs because no other sectors have a business model element.

The processing and storage of digital data is critical to national security and will always be an energy intensive process because data centres consolidate IT functions, concentrating activity into a purpose-built facility. This is massively more efficient than a distributed approach where individual organisation run their own data centres which are not necessarily well utilised or managed.[v]

9 Are there any other criteria that should be considered?

Non commercial enterprise data centres perform fundamentally the same processes as colocation providers. Industry observers and analyists such as the Uptime Institute concur that energy stewardship in enterprise data centres tends to lag behind commercial facilities. Evidence collected from public sector on-premise data centres places this non-business cohort even further behind others in terms of energy efficiency, resilience and modernisation. If the CCA scheme were primarily focused on energy savings, then extending scope to enterprise and public sector data centres should be considered, because the potential efficiency gains are huge[vi] - gains that could well dwarf the entire energy consumption of the commercial sector. These are not being realised because public sector legacy facilities are not incentivised to implement improvements as commercial imperatives are often absent and, moreover, they have been explicitly exempted from policy measures like SECR and ESOS which would have obliged them to identify savings opportunities and report on energy. However, these facilities are unlikely to meet the energy intensity criteria when the whole organisation is taken into account as the data centre is only a small part of turnover due to all the other activities they undertake. A separate route might be needed here.

10 Do you agree that targets should remain primarily focused on energy efficiency?

Sectors can currently choose to have energy or carbon targets, but data centres almost exclusively consume electricity and while over 90% of the power purchased by the UK's commercial sector is certified renewable, this is treated as grid average for the purpose of carbon intensity. Some operators have been able to implement some degree of on-site generation and while to date this is modest, it would make sense to recognise and incentivise this. Other operators are exploring power purchase agreements which fund additional, utility-scale renewable generation, and a means of reflecting this kind of activity, which does not simply consume existing renewable supply, should be considered and a more bespoke carbon target could reward and incentivise these large and costly projects. It also might make sense for the CCA to be more closely aligned with the broader decarbonisation agenda at national and policy level. However, the marriage of decarbonisation targets with energy efficiency targets could be problematic within the CCA scheme. We would be happy to discuss the implications in more detail with those responsible for policy development.

12 What are your views on making compliance with a recognised energy management system a mandatory part of the scheme?

Our larger operators tend to adopt recognisable energy management systems but not universally – some deploy very effective and well-developed internal energy management processes. So we don't believe

these should be mandated. Especially for smaller operators, this would add a large administrative burden that may be wholly disproportionate to the benefits. There is the additional risk of such exercises distracting time and financial resource away from the primary priority of getting on with implementation. Moreover we do not understand what is driving this proposed requirement: is Government able to provide evidence for the difference ISO50001 makes to energy use – for instance in the form of comparisons between companies that adhere to this standard and companies that do not? Has a study to evaluate ISO50001 been conducted in the same way that the effects of the CCA were evaluated? Or is this just a random additional requirement – government is too fond of adding gratuitous bells and whistles to policy measures and this practice should be called out and discontinued.

13 Should such a requirement be applied to all participants or a subset? If the latter, what would be appropriate criteria for this?

We do not believe this should be a requirement. Government cites that many companies falling under ESOS have implemented ISO50001 – how many? What has been the impact? Our experience is that many companies do not see it as the best approach to identifying and exploiting the largest energy saving opportunities.

14 How long do you expect it would take participants who do not currently have an energy management system to adopt one?

Implementing ISO50001 is a non-trivial activity and we do not consider that this requirement is appropriate.

15 Do you agree that additional reporting mechanisms should be introduced to monitor action taken and action planned?

No. Government wants to mandate that historic and future planned actions to reduce energy are recorded and declared to the scheme administrator. We have some concerns with this requirement as it stands: Firstly, reporting actions taken and planned this to the scheme administrator can be subject to a Freedom of Information Request. This is highly confidential information as it can confer competitive advantage. Companies would not want to disclose if there is a risk this information can go into the public domain. Secondly, how will government use this information? It could only be analysed usefully if collected in some standard template which will further increase the administrative burden.

Could an alternative approach be to require participants to hold the information which would form a part of the existing audit process.

16 Do you agree that reporting of energy and throughput data should be annual?

While we object to shortening the target period, we have no objection to reporting energy and throughput data annually.

17 What are your views on potential synergies and efficiencies that should be considered between a future CCA scheme and other auditing and reporting schemes?

There is still far too much duplication and inconsistency between schemes. At the very least, the carbon conversion factors should be consistent between ETS and CCAs. New ETS participants should be able to use CCA data to demonstrate that they will qualify for the Ultra Low Emitters exemption: currently a new site has to shoulder the full ETS burden until enough years of verified data are available to satisfy the scheme operators that they qualify for the exemption and, er, do not need to verify! This is madness when, in reality, acceptance into the CCA scheme should be evidence that as a verified data centre operator, scope 1 emissions will be negligible. SECR should be unnecessary if the same information is already being reported via a CCA. For energy intensive businesses, ESOS adds no value, but does impose significant costs. ESOS reports might help determine action plans but we haven't seen evidence from operators about the value of the ESOS audits or how effective they are in accurately identifying best course of action.

18 Do you agree that mandatory disclosure of the annual financial benefit from reduced rates of CCL should form part of a new CCA scheme?

We can understand why government may want company leadership teams to be fully aware of the value of the CCL discount but we have several concerns about public reporting:

- Firstly reporting this financial information to the scheme administrator can be subject to a Freedom of Information Request and it is highly confidential information. Companies would not want to disclose if there is a risk this information can go into the public domain.
- Secondly, if it proceeds, it must be clear on the difference between "claimed", "received" and "entitled to" as in some circumstances they will be different.
- Thirdly, we understand why leadership teams should recognise the benefits of the scheme, but it would be useful to understand what purpose the reporting element serves.

We would also suggest a threshold for this requirement to avoid a costly financial burden, especially where the benefit of the CCL discount for a business is low.

19 Would this disclosure be helpful in business decision making on energy efficiency investment?

Yes and No: It would be helpful for businesses to be clear on the financial benefit being gained but there is no benefit from reporting the information to a third party.

20 Do you agree that the ratio relative/'novem' target type should be the only relative target type in a future scheme?

We disagree that a novem target should be the only relative target available in the scheme. While there are circumstances when a novem target might be helpful for companies that need to prove that energy efficiency has improved when occupancy decreases, the data required to identify the energy use of each activity and hence establish a novem target, can be a large and expensive task and sometimes cannot be reliably established. This would be particularly problematic for smaller operators.

21 Do you have any specific views on potential changes required regarding throughput measures used within any CCA?

While no issues have arisen to date about quantifying 'throughput' (i.e. IT load – the electricity use of customer equipment) a serious issue has arisen in terms of the relationship between throughput and operational efficiency. Because the metric for throughput is the same as the metric for efficiency, as data centre infrastructure becomes more efficient, operators are being penalised because a diminishing element of the total energy consumed by the site is infrastructure. In all other cases we are aware of, throughput is measured in different units, usually tonnes, from efficiency.

The problem can be explained as follows:
The efficiency requirement is expressed as a percentage reduction in PUE. PUE is the ratio of energy used by the facility compared to energy being consumed by the eligible process, the IT. The lower the PUE, the more efficient the facility.

So if the PUE is 3, then for every 3KWh consumed by the facility, 1KWh is consumed by the IT.
This means that the operator has control over 2/3 of the energy consumed by the site – in other words, has scope to implement improvements on 2/3 of total energy. Usually, a CCA participant is in control of all the energy a site consumes.

If the PUE is 2, then for each 2KWh entering the site, 1KWh is consumed by the IT and becomes the throughput. The operator therefore only has control over 50% of the energy entering that site – the energy not being consumed by the IT. That means that given a target of 2% reduction in PUE, the operator needs to make a 4% energy saving in the infrastructure, because the IT energy is not something he can control.

If the PU is 1.5, then the operator only has control over 1/3 of the energy coming to site, and therefore to deliver a 2% reduction in PUE, the operator has to deliver a 6% energy saving. And so on.

The more efficient the sector is operationally therefore, the more punitive the targets. During the target negotiation BEIS seemed to be unaware of this and demonstrated intransigence, whilst providing no evidence to support their proposed targets, which they subsequently enforced with only marginal

amendment. In effect, BEIS has therefore tightened data centre targets far more punitively than other sectors.

As a result, the data centre sector now has an efficiency improvement target of over 10% for the two year period of TP5. This was exacerbated by BEIS moving the goalposts by changing the baseline from a PUE of 2 to a PUE of around 1.7. We can only attribute this to ignorance within BEIS of the way the sector operates and how the targets were defined. For a Department ostensibly in place to improve the environment for business, this is not good enough.

We therefore ask that the unique relationship between baseline and target be reviewed urgently for data centres: currently, operators are being set up to fail within a scheme that is supposed to protect and support them.

22 Should the scheme continue to have a surplus mechanism to allow overperformance to offset underperformance in future Target Periods?

Yes. This is essential and we were very disappointed that this was not extended to TP5. The implementation of different energy/carbon saving actions may not be in the order anticipated when the targets were negotiated. Hence it is still appropriate not to penalise companies that over-achieve in the early targets when they implemented bigger projects ahead of schedule. Enabling carbon credit to be carried forward /banked also reduces the scope for the scheme to create perverse incentives to delay projects.

23 What reforms should be considered for the surplus mechanism?

We believe it works fine as is but should have been applied consistently into TP5.

24 What reforms should be considered for the buy-out mechanism?

We don't have comments on the buy-out mechanism: it seems to work adequately.

25 Has the pricing for buy-out in the current scheme been effective at discouraging underperformance?

Yes, avoiding paying the buy-out can be taken into account in investment cases but there have been occasions where operators have faced large buy-outs due to a drop in throughput beyond their control, or unfortunate timing of an expansion in capacity – which had the same effect.

26 Do you agree that any buy-out calculation should be based on kWh rather than tonnes of carbon dioxide equivalent of underperformance?

Within the sector we are more familiar with KWh but we don't currently have strong views on this. We would welcome the opportunity to discuss the pros and cons in more detail.

27 Please provide any views in respect of the mechanism for claiming the CCL relief

PP10 and PP11 forms have to be completed and sent to energy suppliers to claim the discount. If these are late then it is difficult to get suppliers to address previous over-charges. The process is not online nor is there a way of checking online if the energy supplier has received the forms. Suppliers cannot apply automatically as they need to know how much discount a site is allowed to claim. We therefore suggest that:

- The process should be changed to one that is completely online.
- Suppliers should issue an annual statement confirming how much CCL discount they have applied to a site, and make it easier to submit and process claims for over payment (i.e. refund due).
- PP10/PP11 forms should be signed by an FD so the company is more aware of the value of the discount received (perhaps tied to recording the annual CCL discount received)
- If HMRC could make a list available to Sector Associations of all sites/companies that have submitted PP10/PP11 forms this would improve transparency.

28 Please outline any specific aspects of the scheme not covered in the proposals above where reform should be considered

There were elements missing from the consultation document, as follows:

- We would have liked to see the consultation document provide scope to review the Environment Agency as scheme administrator.
- There was no opportunity to comment on bubbling of target sites so we assume this will continue unchanged.
- There was no opportunity to comment on the role of sectors in administering CCAs at sector level so we assume this will continue unchanged.
- There was no mention of charging: if reforms are proposed in a future consultation, the impact assessment should consider the future administration costs of the scheme since the population and tasks may change significantly, and it should consider the impact on those who might not remain eligible and their financial and decarbonisation impacts.
- There was no opportunity to review the overall CCA policy process and how it could be improved in future or to address multiple shortcomings exhibited by BEIS, some of which seem to be systemic: These included:
    - Institutional amnesia
    - Lack of relevant technical expertise, business or market understanding of the sectors for which BEIS have policy responsibility.
    - Lack of consistency in approach where targets were changed for operators after they had been legally agreed.
    - The inadequate window for new applicants after the extension which meant that many operators, hard pressed to respond to COVID-19, were simply timed out of the process.
    - Reliance on political ideology rather than evidence and reluctance to accept evidence.
    - Lack of vision: by closing the scheme early and limiting access BEIS compromised a valuable benefit of the CCA at sector level – granular, measured energy data.

We therefore feel that the way that BEIS has handled the CCA scheme should itself be subject to audit and review.

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About techUK

techUK is the UK's leading technology membership organisation, with more than 850 members spread across the UK. We are a network that enables our members to learn from each other and grow in a way which contributes to the country both socially and economically. www.techuk.org

Emma Fryer, March 2022

Endnotes

[i] **What is a data centre?**
A data centre is a building (or self-contained unit) used to house computing equipment such as servers along with associated components such as telecommunications, network and storage systems. A data centre is equipped with a guaranteed power supply and high bandwidth connectivity. Resilience is critical so redundancy (duplication) of networks, power and other infrastructure is common to ensure continuity. Building management controls such as air conditioning maintain the environmental conditions for the equipment within a specified envelope of temperature and humidity, and security systems ensure that the facility and its data remain secure.
We estimate that there are around 500 data centres in the UK, depending on definitions. 200 or so of these are colocation (commercial) facilities, operated by specialist data centre service providers. These include our very largest facilities. The rest are known as enterprise, which loosely means "in house" although they may be remote from other business operations. These underpin corporate IT functions for all sorts of organisations like universities, banks and supermarkets. Sizes vary but on average these facilities are smaller. Many organisations use a mixture of outsourced and in-house provision to minimise costs and risk.

[ii] **What is digital infrastructure?**
Our core digital infrastructure is not a single system but multiple systems and networks that interoperate. The three main constituents are fixed line telecommunications (made up of the high capacity and highly resilient core network plus the access network that runs from the exchanges to tens of millions of individual customer premises), mobile telecommunications (that interact with the core network but provide customer coverage through a cellular network) and data centres (that manage, transmit, process and store data for government, businesses, individuals and academia).
[iii] https://www.digitalrealty.co.uk/data-economy

[iv] PUE, or Power Usage Effectiveness is a measure of energy productivity widely applied to data centres. It is the ratio of energy delivered to the IT function divided by energy to the facility. The lower the PUE, the higher the energy productivity.
[v] See: Lost in Migration: Attributing Carbon to Cloud: https://www.techuk.org/asset/EDB613B7-C74A-414B-A53B2964FE9A7558/

[vi] See the report from the EURECA project which reviewed around 350 public sector data centres and found average PUE to be around 5, around six times less efficient than commercial facilities where PUE is around 1.7. They also found poor computing efficiency which is likely to mean that many public sector data centres are at least an order of magnitude less efficient than their commercial equivalents:
https://ec.europa.eu/research/participants/documents/downloadPublic?documentIds=080166e5bb754090&appId=PPGMS