Climate Change Agreement for Data Centres

First Findings Report | November 2014

Review of take-up and registration
Strategic implications for the sector

techUK representing the future

In association with
CBRE

Contents

Foreword

Andrew Jay
Executive Director, CBRE
Chairman, UK Council of Data Centre Operators

Data centres are a fundamental – but unrecognised - part of our critical national infrastructure. Data centres underpin an incredible range of activities across government, business and society and are now part of our lives whether we like it or not. Our digital economy and our highly networked society rely on data and connectivity being managed securely and efficiently. If we want to live connected lives then we need data centres.

The successful negotiation of a Climate Change Agreement for Data Centres, initiated and delivered by the UK Council of Data Centre Operators, is testament to the ability of this relatively young sector to work collaboratively and productively with government and other stakeholders.

I am delighted that the scheme is now up and running, that so many facilities have successfully registered and that they, their customers, the environment and the economy will be benefiting. The experiences of this first cohort are captured in this, our first findings report.

Emma Fryer
Associate Director, Climate Change Programmes
techUK

Data centres enable and power service economies in the way that heavy industry used to power manufacturing economies. Due to the accelerating demand for digital data this sector is growing rapidly and generating skilled jobs and economic value. As it grows, it in turn improves competitiveness and underpins growth in an astonishing range of businesses. In the knowledge economy, data centres are the agents of growth.

The last four years have presented a steep learning curve for me and I was delighted – and relieved – when the CCA eventually came into force in July. Now our data centre operators are dealing with their own learning curve as they get to grips with the nuts and bolts of registration and implementation. What is clear is that the heavy lifting is by no means over and we will be watching closely to see how companies meet the requirements of the scheme, and also the impact it will have on energy stewardship and investor confidence looking ahead. So this is very much the beginning of the process, not the end.

Executive summary

This report is not intended to be comprehensive, definitive or formal. It is simply a reflection on progress to date and sets out the preliminary findings from the early adopters of the Climate Change Agreement (CCA) for Data Centres. Although it is early days, the closure of the first application window presents us with a natural pause in the process and an opportunity to draw breath and take stock.

The objectives of the CCA are to improve energy stewardship without damaging growth. Participants undertake to meet energy efficiency targets and in return have the opportunity to benefit from concessions on some carbon taxes. For data centres, these efficiency targets will take the form of a reduction in PUE: the exact reduction required for each site will depend on current performance. The scheme runs until 2023 and the targets are spread over four milestones. Although not perfect, PUE was chosen because it is well understood and measurable.

Negotiations between techUK and the Department of Energy and Climate Change (DECC) started back in 2009 and lasted for four years. The CCA was confirmed by the Chancellor in the 2013 Autumn Statement and was brought into law on 1st July 2014. The scheme has now moved into its implementation phase, which involves three main parties: the Environment Agency (EA) who administers and enforces it on behalf of DECC, techUK (the sector association) who acts on behalf of the sector, and individual participants (data centre operators). Other organisations provide technical assistance.

Uptake by the first cohort of registrants was better than expected and demonstrates good industry engagement: 100 facilities applied and 98 were successful – exceeding our prediction of 90 sites. Two did not have adequate base year data and will need to reapply in 2015. Turnaround time from application to Agreement varied from 7 days to 100 days.

The average base year PUE was 1.93, very close to the PUE of 2 that we predicted. The average reduction target in PUE was 14.39%, again close to the 15% we negotiated for the sector. Targets ranged from just under 10% to just over 21%, depending on base year performance.

Key Metrics established from base year

	CCA Target	Min	Average	Max
PUE Base year	2.00	1.42	1.93	3.44
PUE Reduction	15%	10%	14.39%	21%

Annual gross energy going through the scheme is just below 2TWh. Should companies wish to take advantage of both CCL rebate and CRC exclusion, the average value of rebate (although in reality this varies wildly) is just under £275,000 per site, per year.

The registration process presented multiple learning opportunities: what we got right, what we got wrong, how the process was perceived by the different parties, the problems that cropped up and how we dealt with them - and how we will apply these lessons to the next cohort of applicants. In general, many participants had underestimated the complexity of the process and the rigour and attention to detail that was required in the supporting documentation. Coupled with the fact that a number of clarifications were required on issues unique to data centres this made the application window extremely tight.

The CCA is not just a tax rebate; it also has wider implications for the sector. It signifies formal recognition by Government that data centres exist and contribute to the economy. The improved policy stability will drive greater investor confidence. We should also see improved competitiveness and better energy stewardship. We may also see changes in approaches to power purchasing. It looks likely that the CCA will also be an effective tool in delivering policy objectives because of its ability to escalate targets and because it has wider reach, greater certainty and fewer perverse incentives than other schemes.

The report ends by looking further ahead at how the scheme might develop in a perfect world. We see four main areas of opportunity – expansion to include enterprise operators, better informed policy dialogue, a better understanding of energy use at both facility and sector level and improved best practice through formal collaboration with existing industry tools and initiatives. An Annexe provides links to further information on the CCA and a list of useful contacts.

How to use this report

If you are a data centre operator considering participation: then you should look at sections II and IV which introduce you to the scheme and identify some of the things you should be aware of if you plan to apply. However, there is much more comprehensive information available through our CCA helpdesk and our CCA webpages. See the Annexe at the end of this document for a list of materials, contacts and links relating to the CCA.

If you are already a participant: then this report will probably not tell you anything you don't already know but you may find it interesting to see how many other operators participated and compare experiences. See sections III and IV for that.

If you are an energy consultant: then you will probably know all there is to know about the way the scheme works but you will be interested in how many companies applied, how they found the registration process and the things that you should look out for when taking sites through the scheme. See sections III and IV for that. Section V is also worth a look because it sets out what we expect to see in terms of energy stewardship.

If you are an industry analyst or in any way engaged in the policy process: then you should look at sections V and VI which cover the strategic implications of the CCA scheme for the data centre sector, including observations on how we hope the scheme will fulfil its policy objectives.

Further information

If you have queries regarding the content of this report, need further information or wish to know more about techUK's data centre programme then please contact Emma Fryer, Associate Director, Climate Change Programmes, techUK, E emma.fryer@techuk.org

1 Introduction

This section explains why we are writing this report and what information it contains.

Why we wrote this interim report

The Climate Change Agreement (CCA) for Data Centres generated considerable curiosity in the sector during the protracted negotiations with Government and this curiosity has, if anything, intensified since the scheme was confirmed in the 2013 Autumn Statement and subsequently came into effect on 1st July 2014. As a result the Data Centres CCA has been the subject of widespread comment by external observers from media and industry, and some of this comment has generated confusion on this complex and highly technical topic.

We originally planned to produce our first report on the CCA in July 2015 when we have the results from the first target period and will be able to see how facilities and operators have performed against the first scheme milestone. While we still intend to report at this point, we have decided to circulate an additional, interim, report to provide an overview of the scheme to date and to set the record straight in a few areas.

What this report will tell you

- It will provide a brief introduction to the CCA scheme for data centres
- It will provide basic facts and figures on take-up – number of participants and baseyear performance
- It will review the application process in terms of what we have learned from it
- It will consider, on first impressions, the strategic implications for the sector
- It will consider briefly how the scheme might develop in future

What this report will not tell you

This report will **not** tell you how facilities have performed against the targets because the first target milestone does not arise until the end of 2014. Moreover, it will not tell you much about facilities in 2014 because all the data that we are using is base year data – the year **against which** companies will be benchmarked. In most cases this year will be 2011 but the base year can include any subsequent 12 month period up to and including 2014.

This report is not intended to be definitive, comprehensive or formal: it is merely a heads-up for those interested in the scheme, how it is delivered and what it means for the sector.

II CCA scheme: quick overview

This section explains the CCA scheme, what it is, who is eligible, what the benefits and obligations are and how it works.

What's a CCA?

Climate Change Agreements (CCAs) are negotiated arrangements between government and energy intensive sectors. 53 industry sectors are already covered and the scheme has been running since about 2001. In return for a reduction in or exclusion from paying some carbon taxes (CCL and CRC), participants are given energy efficiency targets. These targets are sector-specific so they can be focused exactly where they can deliver the most benefit. To date, CCAs have delivered greater energy savings among participating sectors than conventional policy measures would have achieved. Because CCAs accommodate growth by focusing on energy efficiency instead of net reductions, they are particularly suited to drive efficiency improvements in sectors like data centres that are energy intensive, growing fast, and vulnerable to overseas competition.

Who is eligible?[1]

Data centre businesses providing colocation space (both wholesale and retail) are eligible. A facility will be classed as colocation if it houses third party computing assets (i.e. servers). Space used to house servers that provide corporate IT function for the operator is ineligible. This exclusion is because only the colocation model was energy intensive enough to qualify for the scheme. However, we will be seeking to expand the scheme to enterprise operators on the basis that they do exactly the same thing.

Box 1: The definition of the eligible process is where:

The business activity is the leasing or licensing of a data facility which is being used as a data centre.
"data facility" means a room, or rooms sharing the same electricity supply circuit, occupied mainly or exclusively by computer equipment which is enabled to transfer data electronically, and where in respect of the room or rooms -
(a) the temperature and humidity is regulated in connection with the operation of the computer equipment;
(b) the electricity supply is at least 200kW; and
(c) electricity is supplied by a back-up electricity supply when the mains supply is interrupted.

Our **Decision Tree** clarifies which facilities are eligible.

What are the benefits?

For operators paying both CCL and CRC, the value of the CCA rebate is around £27 per tonne of carbon (CCL is around £10 per tonne and CRC is around £16 per tonne).[2] This is made up of a 90% rebate on the CCL, (0.541 pence per KWh of electricity from 1st April 2014), and the exclusion of energy captured under the CCA from CRC (equivalent to 0.867p per KWh from 1st April 2014). In normal language this means that the combined benefit is 1.35p per KWh of electricity. If you want to see this for real use CBRE's Ready Reckoner by following the link or visiting our CCA web pages.

1 See Decision Tree: Are you eligible for the CCA?
2 From April 2014

What are the obligations?

A climate change tax concession can only be granted if energy efficiency can be improved by alternative means. So participants have to work towards efficiency targets. The **sector** target has been agreed as a 15% reduction in PUE[3] by 2020 over a 2011 baseline.

Box 2: The 30% reduction in non IT power is a clever way of amortising the target fairly over the sector but the individual targets, just like the sector targets, will still be expressed as a required reduction in PUE. Your target reduction will depend on how your baseline PUE compares to the sector average for 2011. So....

If your baseline PUE is	Then YOUR target is	So... your milestones are ...	Target end 2014	Target end 2016	Target end 2018	Target end 2020	Your final PUE should be
All figures relate to 0% reduction in PUE							
1	0%		0	0	0	0	**1**
1.5	10%		0.68	5.56	9.16	10	**1.35**
2	15%		1.00	8.33	13.75	15	**1.7**
2.5	18%		1.20	10.0	16.50	18	**2.05**
3	20%		1.33	11.1	18.33	20	**2.4**

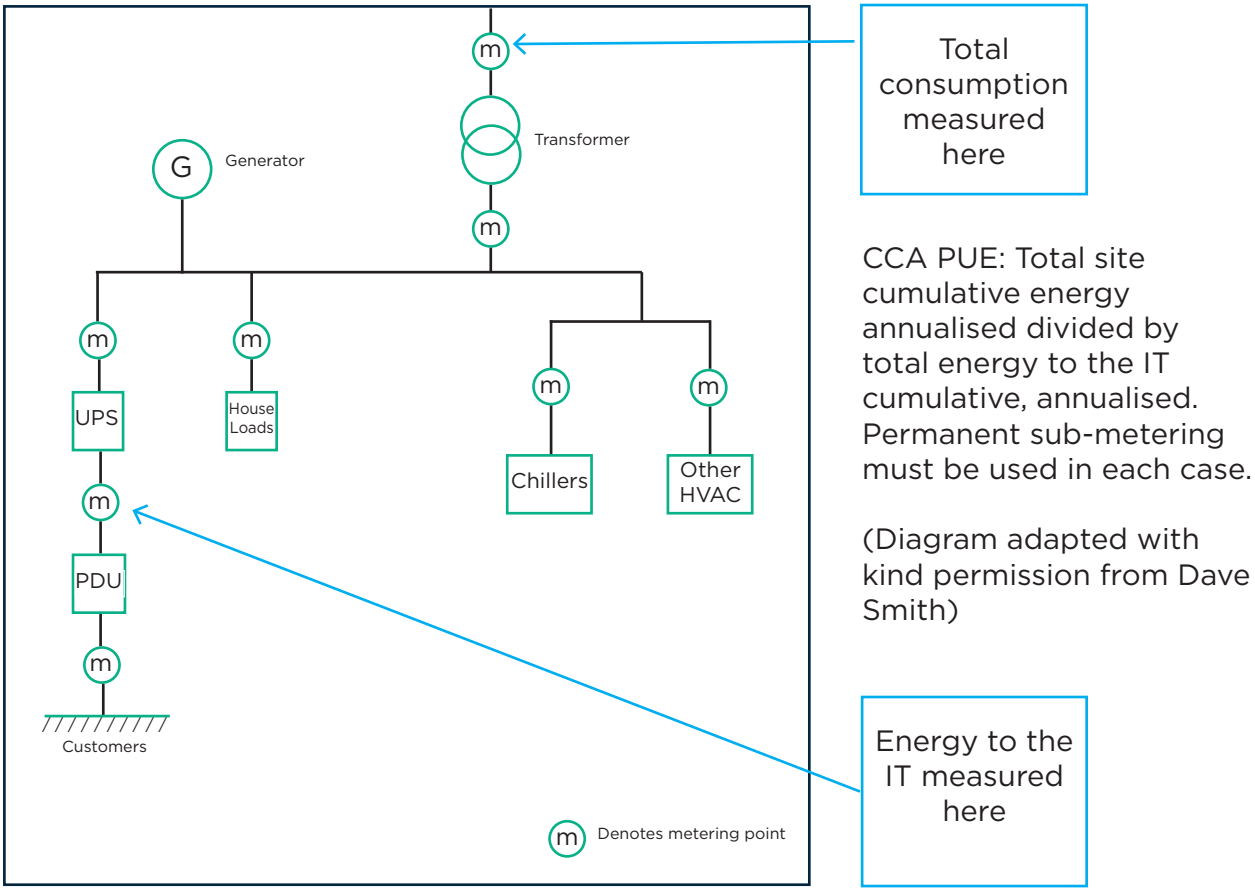
To spread the reduction requirement more fairly and avoid punishing early adopters who already have a low PUE, this sector target has been amortised over the industry based on the application of a universal requirement to reduce non-IT energy by 30%. **Individual** site targets will be expressed in terms of a reduction in site PUE over the same period but will depend on how the baseline PUE for that site compares to the baseline PUE for the industry which is set at 2 (See box 2). Sites with higher base year PUEs will have to make larger reductions than sites with lower base year PUEs. Operators with new sites need not delay application until a site fills to get a low base year PUE because growing occupancy will help drive down the PUE as the facility matures.

PUE will be measured on the basis of total energy to site divided by total energy to the IT (similar to Green Grid PUE 2). The targets will be revised in 2016 when we expect to have more sophisticated metrics and standards available. Companies who miss their targets have to buy enough carbon to make up the difference. This is called the “buyout” stage. The targets are challenging but not punitive and they are designed to allow growth while encouraging good energy stewardship.

3 PUE or Power Usage Effectiveness is the ratio of energy delivered to a site and energy delivered to the IT. The lower the PUE, the better.

The measurement of PUE for the CCA has generated a great deal of confusion so the diagram below shows where the measuring points are – ie where the permanent sub-meters need to be located. All measurements are cumulative, annualised and in KWh or MWh.

Diagram 1: Measuring PUE for the CCA Scheme



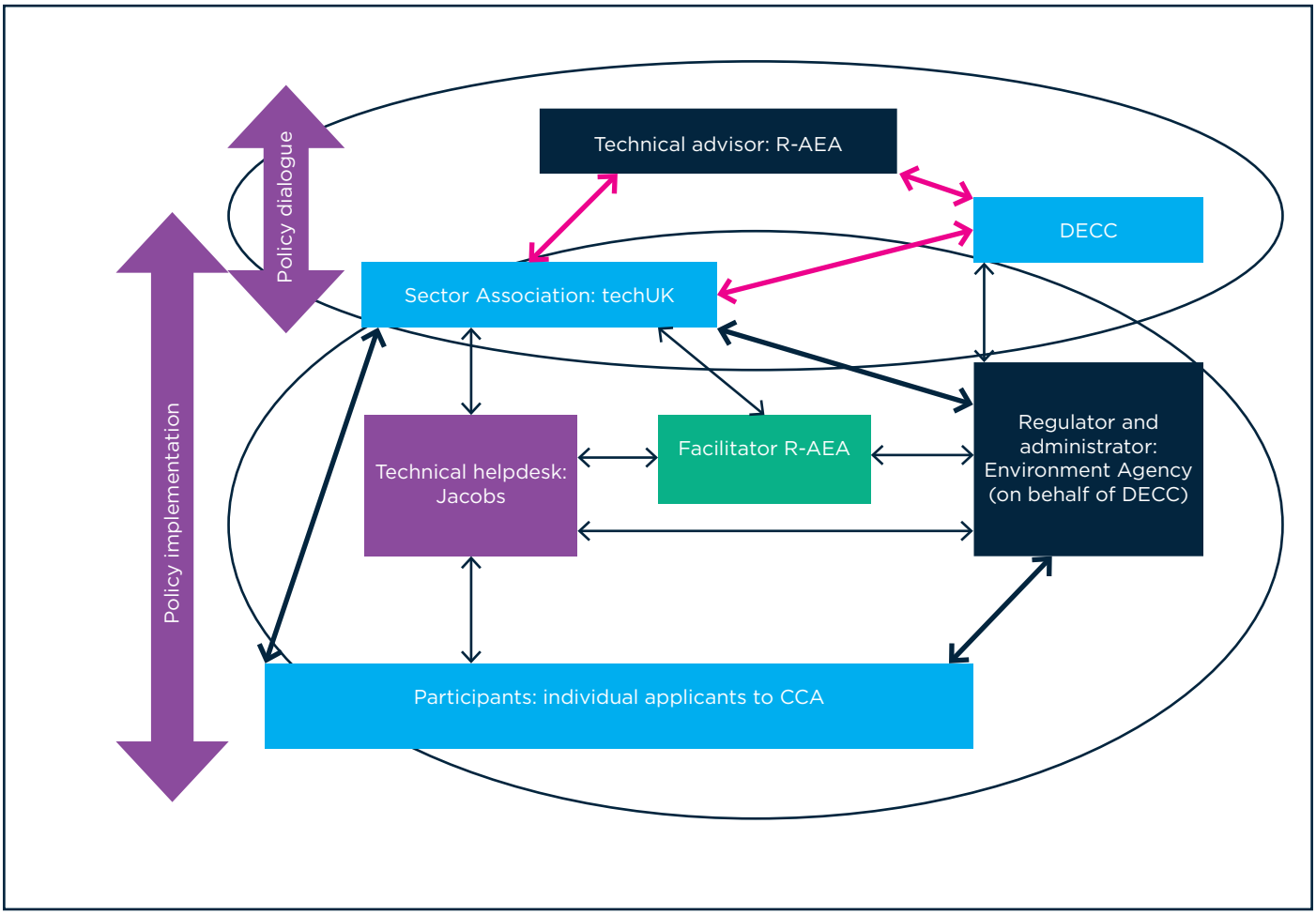
How does the scheme work?

The scheme is the result of a two-way negotiation between the Sector Association (techUK) and the Department for Energy and Climate Change (DECC). DECC is assisted by technical consultants because policy makers in DECC cannot be expected to be specialists in multiple sector markets or technologies. Once the scheme has been agreed, DECC devolve the administration and enforcement to the Environment Agency (EA), and the arrangement becomes a three way system between the Sector Association, the EA and the individual participants. The association essentially alerts the sector, collects, collates and presents data and negotiates access to the scheme, the targets, the target milestones and any other concessions or special considerations on its behalf.

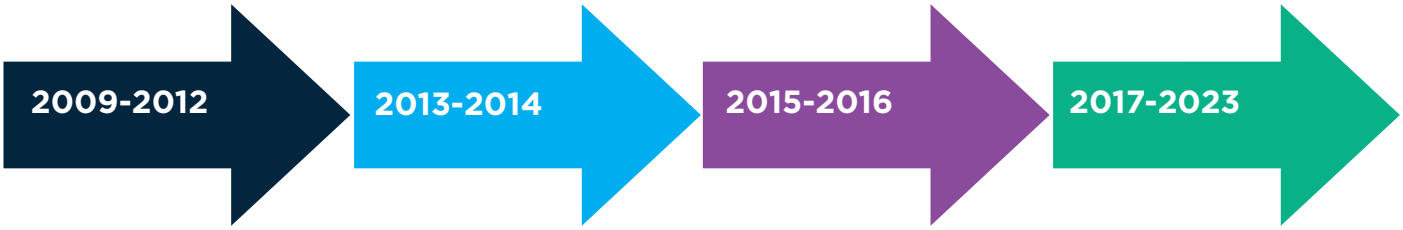
The Association signs a sector-level agreement, or Umbrella Agreement (UmA), with the EA and individual participants sign Underlying Agreements (UnAs), also with the EA. The EA appoint a Facilitator to help check and administer the applications they receive (in this case Ricardo-AEA). The Sector Association may also appoint a technical contractor to prepare and submit the applications on their behalf (we have Jacobs who run our technical helpdesk). Some participants appoint energy consultants to help them prepare their individual submissions. It all ends up looking like a rather complex landscape but the key relationship is a triangular one between techUK, the EA and individual participants. Operators do not have to be members of techUK to participate; it is open to all.

Diagram 2: Relationships between the various parties in the CCA

During the negotiation the dialogue is between the Sector Association (techUK) and DECC who are helped by a technical consultant. In this case it was Ricardo-AEA. During the delivery phase, techUK works in a three way dialogue with the Environment Agency and the individual participants.



Timelines of the Data Centre CCA



2009: Data Centres Council formed and open preliminary negotiations with DECC

March 2010: Formal negotiations open... and close... until future of CCAs confirmed

March 2011: CCAs to continue... but no new sectors planned

Sept 2011: Stakeholder meeting with DECC's head of CRC

Oct 2011: CCA door re-opens for data centres

Jan 2012: Carbon arguments accepted

Feb 2013: Energy intensity demonstrated

April 2013: Energy data accepted as representative

June 2013: First cohort of participants restricted to colos

Dec 2013: Confirmation in Autumn Statement

Mar 2014: Definition of eligible facility agreed

June 2014: Data Centre efficiency target and target profile agreed

1st July 2014: Statutory Instrument comes into force: Scheme now live!

14th July 2014: techUK signs umbrella agreement for the sector

28th Aug 2014: First applicant receives their Underlying Agreement

31st Oct 2014: First target period closes to applicants

31st Dec 2014: First target period ends

1st Jan 2015: Next cohort of applicants can apply

31st Dec 2016: Second target period ends

2016: Efficiency targets reviewed

31st Dec 2018: Third target period ends

April 2020: Fourth target period ends

2023: Scheme ends

III Industry take-up: fast facts

This section looks at the facts and figures from the first cohort of registrations: how many companies/facilities applied, how many were successful, who was first past the post and who was the fastest through the process, what the average base year PUE was and how this compared to our predictions, what the targets were and how they varied, how much energy is going through the scheme and what that means in terms of CRC exemption and CCL rebate for operators. With special thanks to Jacobs for preparing the data for us.

The CCA is split into four target periods, each of which represents a milestone en route to the 2020 target. Participants have to report progress against each milestone at the end of each target period. The first target period ends in December 2014 and because nobody can join the scheme in the last two months of any target period, there was a very short window between the scheme coming into law in July and the deadline for companies to prepare their data and submit their applications. This report therefore covers the first cohort of data centre operators to participate in the scheme. We expect more sites to join from January 2015 and we are already helping some operators to prepare their data.

Applications

98 Facilities
98% application success rate

25 Operators
96% application success rate

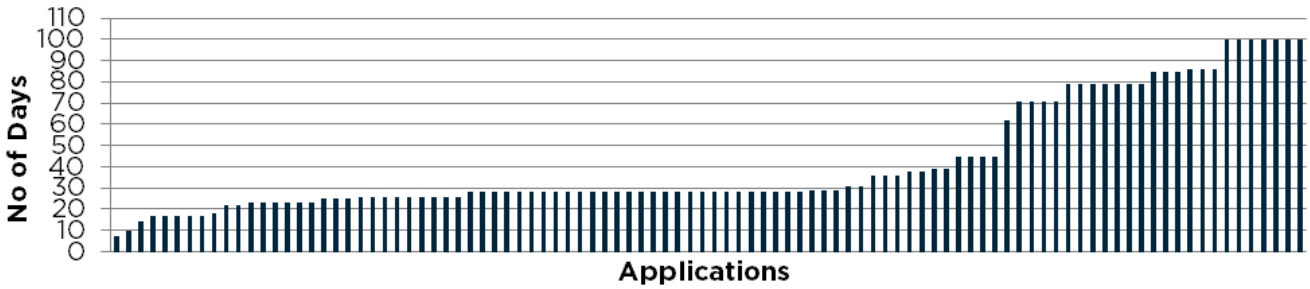
36 Target Units
95% application success rate

- Number of facilities applied: 100. Number of facilities participating: 98
- Number of operators applied: 26. Number of operators participating: 25
- Number of "target units" (separate Underlying Agreements): 36 (38 applied)
- Number of facilities deferred: 2 (due to incomplete base year data in both cases)
- Number of sites deemed ineligible: 0

Graph 1: The success rate of applications at operator (left), target unit (middle) and facility (right) level

Registration processing

- First past the post: Next Generation Data, Newport: NGD were first to apply, first to be processed and first to receive their agreement, on 28 August 2014
- Date first application received: 27 June 2014
- Date last application received: 10 October 2014
- Fastest through the process from application to agreement: 7 days[4] - Virtus Enfield site (singled out by the EA for the quality of their documentation)
- Longest time taken from application to agreement: 100 days. This honour was shared by a number of operators who all had difficulty in extracting historical data from legacy or acquired sites. Early applicants also tended to take longer because all parties involved were getting to grips with the scheme, clarifying issues and setting precedents.
- Average through the process: 42 days
- Mode: 28 days

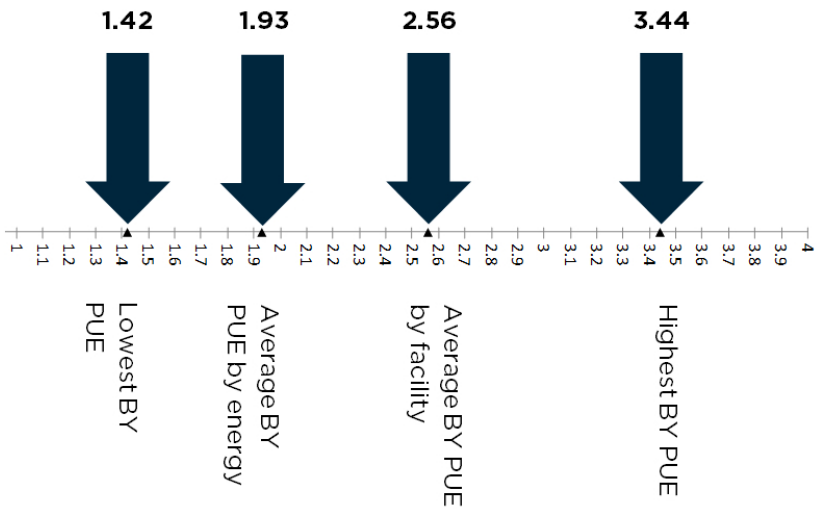


Graph 2: "flash to bang" periods for applications from initial submission to Underlying Agreement

Base year PUE and targets

- Lowest base year PUE for a facility was 1.42
- Highest base year PUE for a facility was 3.44
- Average base year PUE by facility was 2.56
- Average base year PUE by total energy amortised across all facililties was 1.93[5]
- Analysis of base years: of the 98 successful sites 61 had a 2011 base year, 12 had a 2012 base year, 23 had a 2013 base year and 2 had a 2014 base year.

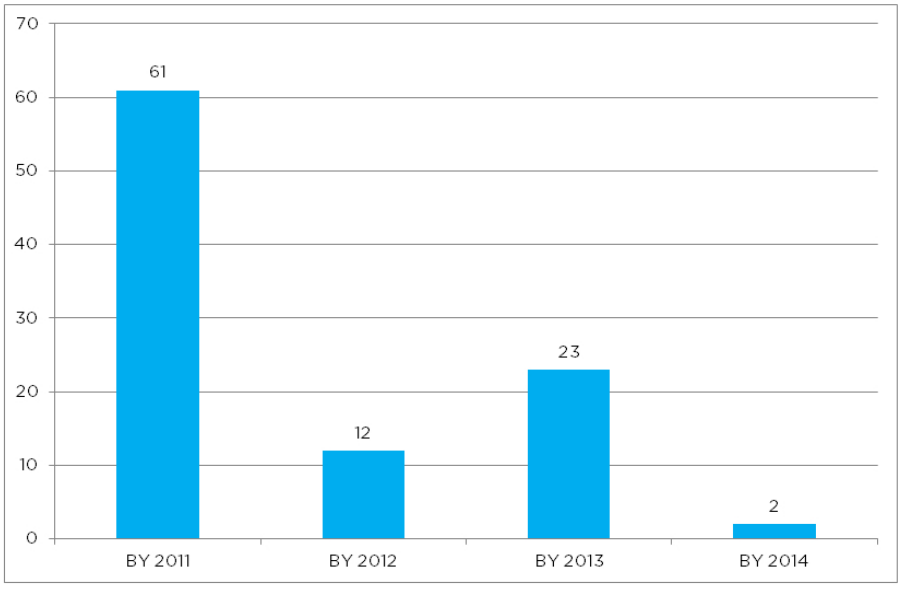
4 All timings include weekends so this represents 5 working days – a remarkable achievement



Graph 3: range of base year PUE

- Targets ranged from a reduction in PUE of just under 10% for the sites with the lowest base year PUE to over 21% for the sites with the highest base year PUE[6]
- Average target was a 14.39% reduction in PUE

Target period	Lowest target reduction in PUE	Highest target reduction in PUE	Variation
Target period 1	0.25%	1.43%	1.17%
Target period 2	4.89%	11.9%	6.99%
Target period 3	9.14%	19.6%	10.5%
Target period 4	9.97%	21.4%	11.4%



Graph 4: base years (BY) used by participants

5 We estimated that the average PUE in the sector in 2011 was 2, so this is very close. The slightly lower PUE is most probably a reflection of the fact that a proportion of base year data was more recent; this figure includes PUE for base years later than 2011 so the real 2011 figures is likely to be much closer to 2, possibly slightly above 2.
6 There is a slight discrepancy here:a couple of sites have disproportionately high PUEs because the way PUE is calculated for the CCA is to divide the IT energy into the whole site energy. For those sites where not all the site is dedicated to the data centre the result is a misleadingly high PUE. This affected three smaller sites.

Energy through the scheme

- Total annual electricity going through the scheme: **1,995,810 MWh**
- Total IT electricity going through the scheme (based on base year data):[7] **1,015,360 MWh**
- Total "Primary Energy" going through the scheme: **5,139,513 MWh**

Green Stuff: What do we mean by Primary Energy?

DECC like to use primary energy to measure energy requirements. Primary energy means the amount of energy needed to produce the electricity that we use in our data centres –i.e. the input energy rather than the output energy at point of generation. So they apply a factor of 2.6 to all the electricity consumed by the facility. The reason they use primary energy is that it is fully comparable irrespective of the form in which that energy is delivered. Seeing primary energy figures in KWh or MWh usually gives operators a bit of a shock but it is a genuine representation of the energy needed to produce the electricity that we use.

Value of CRC exemption and CCL rebate

- Annual CCL rebate available to current participants: £9,234,803
- Average annual CCL rebate available per site: £94,232
- Total annual CRC exemption for current participants: £17,590,738
- Average annual CRC exemption per site £179,497
- Combined annual average value per participating site if both CCL rebate and CRC exemption are claimed: £273,739

Participants

The list of participating companies is as follows. Between them there are 36 Target Units (i.e. a single company may have more than one agreement with the EA), and 98 sites.

Ark Data Centres Limited | CenturyLink Technology UK Limited | Colt Technology Services CSC Computer Sciences Ltd | DataBanx Limited (Onyx) | Digital Realty (UK) Limited | Equinix Fujitsu Services Limited | Global Switch Limited | Gyron Internet Ltd | IBM Business Continuity and Resiliency Services | IBM United Kingdom Limited | Iomart Hosting Ltd | Level 3 Communications Ltd | Next Generation Data Ltd | Pulsant Limited | Six Degrees Group Sungard Availability Services (UK) Limited | Talk Talk | TATA Communications (UK) Ltd TelecityGroup UK Ltd | Telehouse | Telstra Limited | Unisys Limited | Virtus | Vodafone Ltd

7 In reality more energy will be going through the scheme because many sites have grown since the base year, 2011. We will have up to date figures in July 2015.

IV Registration review

This section explores what we learned from the registration process: what we got right, what we got wrong, problems that cropped up, how we dealt with them and how we will apply these lessons to the next cohort of applicants.

The registration process explained

Registering for a CCA is not something that can be done on the back of an envelope in an airport lounge. Government has to be confident that participants are eligible and that the efficiency targets they are given are robust, so the data and documentation requirements are demanding. Operators may choose to register all their sites together in what is called a "bubble", to register them individually, or to mix and match them in smaller "bubbles". Each site or bubble of sites is called a Target Unit or TU and is covered by an Underlying Agreement between the operator and the EA. So a company with ten sites in a single bubble will have one agreement and a company that has submitted ten sites separately will have ten agreements. The registration process for participants follows four main steps.

1 Submission of application and upload to the EA Registry
The first port of call is techUK's technical helpdesk. Here, operators can check eligibility and request a registration pack. The helpdesk review applications and provide technical guidance and support. When they are happy that the application is robust and is accompanied by all the required data then they send it to the EA. In reality this means that they upload the application to the EA Registry.

2 Approval (or rejection) by EA Facilitator
Once on the registry the EA's facilitator reviews the application and if they are happy with the documentation and supporting data then they will approve it. Usually they ask questions first. It is very unusual for sites to be approved by the facilitator without any queries at all.

3 Underlying Agreement issued followed by operator Assent
The facilitator's approval is not the end of the process. The EA then have to issue a proposed Underlying Agreement to each target unit (site or bubble of sites). The participant then has to assent formally to this proposal. The EA will then issue an Activated Underlying Agreement (UnA).

4 Participants claim rebate and implement improvements
The date on the agreement is the date from which participants can claim CCL rebate and exclude energy from CRC so they can submit PP10 and PP11 forms for their CCL rebate and adjust their CRC reporting. They should also be implementing efficiency measures and preparing their reporting documentation, but that is another story...

What did we learn?

The CCA came into law on 1st July. As mentioned above, applications for the first target period, which ends on 31st December 2014, had to be processed before 31st October to be included in the first phase.[8] Those missing this deadline have to wait until January 2015 - phase II and miss out on at least two months of rebate. In reality this meant that all applications had to be in before the end of September which left a very short window for companies to get to grips with the requirements of the scheme, assemble and prepare their data and make their formal submissions.

We had held two preparatory sessions in May to socialise the industry with the technical requirements of the scheme and take participants or potential participants, step by step, through the detail of the application process. Operators could then register their interest for the scheme. As registration progressed, a number of issues arose. Some were generic, some were specific and had to be resolved through the development of bespoke solutions, some were about understanding the process, structure and concept of the scheme and others were technical. We have divided these issues into generic and technical.

Generic and process issues

Readiness: We learned quickly that the phrase "Yes, of course we are all ready!" did not mean that anybody was anywhere near ready and it became clear that some operators had been taken unawares by the level of data required and the degree of rigour applied to supporting evidence. In an industry that obsessively monitors energy use one might be forgiven for assuming that all relevant information on energy consumption would be readily available – as it usually is - but the scheme requirements absolutely insist that energy is measured and presented in a particular way and all supporting documentation is equally proscribed. There were technical issues like sub-metering (see below) to resolve and the level of detail required on the site plans was greater than perhaps we had been led to expect. For some operators this was an area where energy consultancies could add value.

Terminology: As well as the very demanding registration requirements, the CCA has generated its own array of terminology which has to be interpreted – "Target Unit" or TU, "Bubbles", "Underlying Agreements" or UnAs, Baseline, BaseYears or BYs are just a few of the terms associated with this policy tool. As a result we had to do some rapid work with Jacobs, our technical helpdesk, to interpret this somewhat idiosyncratic language so that our data centre operators could understand what they were being asked to do. Simultaneously we worked in the other direction translating equally impenetrable technical data centre jargon into the kind of English that the EA team could understand.

Timing: For operators engaged in carbon stewardship programmes the application window coincided with other reporting deadlines, for instance that for reporting in to the Carbon Disclosure Project. Some of these deadlines are non-negotiable and for those operators this delayed their CCA application.

8 To clarify: In technical terms, an operator must have assented to their underlying agreement with the EA and the assent must have been received by the EA by 31st October for a target unit to be included in the first target period.

Complexity: The CCA scheme is actually one of our simpler policy tools; certainly the concept is straightforward: "if carbon taxes damage your competitiveness, you can be exempted from them provided you can improve efficiency through alternate means". Once up and running, it really is not difficult to comply with. However it is complex in implementation, particularly at the start, and also involves a bewildering array of players (see diagram 2). Add to that the fact that data centres are themselves exceptionally complex things, that no two facilities are the same and that operators have different approaches, the result was a lot of head scratching. This was particularly true for multi-site operators with facilities of mixed provenance who had to get to grips with bubbling and unbubbling and different base years. It was a very steep learning curve for everyone. The EA were dealing with a sector unlike any they had encountered before and everyone had to learn at least one new "language".

Engagement: It soon became clear that operators who had not been closely engaged in the negotiations and were therefore unfamiliar with the scheme were struggling to understand the business case for the CCA – or at least struggling to understand how to present the business case internally. Many misunderstood the target obligations and how the buy-out system works and what has to be "bought out" if targets are missed. CBRE produced a "ready reckoner" that calculated these costs for companies. For the next cohort this ready reckoner will form part of a more detailed document that sets out the business case for participating in the CCA, and how to present it. It will also set out those circumstances where there is no business case for participating in the CCA – for instance where companies are too small to be obliged under CRC and do not pay CCL.

Technical issues

A number of technical issues emerged; some were addressed before formal registration opened but most arose during the registration process. Some were very bespoke and were resolved individually with the operator affected but many were common to a number of applicants and so we produced "common issue" guidance notes. We also ran regular CCA surgeries and one to one sessions with operators to discuss issues. The following were the most frequently encountered.

Measuring PUE: sub-metering the energy to the IT: Measuring PUE was probably the most important issue that we had to address, because PUE is measured in lots of different ways, but for the CCA there are important requirements regarding sub-metering that many operators would not be able to comply with retrospectively for their base year data. We sought to clarify these and ran a preliminary workshop with the EA in early June to address the issue that many operators would not have cumulative, sub-metered data for their IT energy consumption in the base year. We negotiated a concession from the EA that allowed, under certain circumstances, spot metered data to be used. However, all participants must have permanent sub-meters to measure cumulative energy to the IT as a condition of participation going forward. We produced a guidance note to explain the exact requirements.

Green Stuff: Measuring productivity and efficiency

For other sectors with CCAs, efficiency is measured in terms of the relationship between total energy to a site and what is produced at that site. In all other cases, the outputs is physical by nature and productivity is measured in tonnes or by numbers (like cans of baked beans or cement, ie for XMWh of energy to a site, Y tonnes of baked beans were produced). Digital services cannot be measured in this way. For the data centre CCA the metric chosen to measure productivity is PUE, which means that, uniquely, productivity for data centres is measured in terms of energy: energy to the IT.

“Green” power: the interaction of green power purchasing and the CCA is an interesting one. CCL rebate cannot be reclaimed on power on which no CCL has been paid. This has confused applicants. Purchasing green power from the grid is no substitute for efficiency improvements and we would always rather see the latter take precedence. We produced a guidance note on this that also addresses how the CCA may influence future power purchasing decisions.

Base year data: there were technical issues regarding bubbled sites with different base years. This was resolved with a guidance note.

Understanding the Underlying Agreement: the agreement that operators sign with the EA is around 25 pages long. The first 20 pages are standard and cannot be changed. The schedules at the end, however, are specific to the applicant and need to be checked. Companies had to understand the schedules without getting the whole document stuck in their legal departments. These schedules present their energy data in a rather Delphic way. We produced a note to demystify them.

Documentation delays: participants are required to submit documents in very specific formats and in a very proscribed manner. Registrations failing to comply with the documentation requirements are simply rejected. This was explained in a guidance notes.

Measuring fuel to the generators: generator fuel comprises a negligible percentage of energy use for data centres but there are nevertheless formal requirements for measuring the fuel to gensets. There was considerable confusion here and this issue is still not fully resolved. Sample approaches that have been deemed acceptable were captured in a guidance note.

Getting to grips with the 70:30 Rule: The 70:30 rule is an idiosyncrasy of the CCA scheme and is actually there to help simplify reporting. Because it is unfamiliar it caused enormous confusion among operators. This was largely resolved through the technical helpdesk but we will produce a detailed guidance note for the next cohort of applicants.

EUETS, CRC and CCA: during registration a clarification on CRC was issued by the EA that changes the relationship between these three policy tools. Energy to sites obliged under EUETS is now exempt from CRC. A guidance note explains this, and the implications for CCA participants.

What speeds the process up? What slows it down?

As noted in the Fast Facts, the "flash to bang" time from submitting an application to being issued with an Underlying Agreement varies enormously. The fastest turnaround was 7 days (actually only 5 working days) and the longest was 100 days. In some cases having an existing energy consultant who knew both the data centre business and was familiar with the CCA scheme was an advantage.

We asked the EA for their comments on this and they are summarised here and reproduced in more detail below: Good documentation, clear and precise descriptions, a clear and well annotated site plan would all speed the process up. Most delays related to documentation not meeting the requirements, lack of evidence that the 70:30 test had been passed and inadequately detailed metering arrangements especially relating to the base year.

How did we deal with these issues?

We were fortunate to have excellent support from staff at the EA, at Ricardo-AEA, and at Jacobs plus assistance from our Technical Committee. This meant that whatever the issue, there was always an expert on the CCA and an expert on data centres at hand and willing to help, which made it possible to clarify issues relatively quickly, albeit it did not necessarily make them easy to resolve.

As the sector association we worked to respond to the needs of operators wishing to participate in the scheme. These are some of the things we did:

- We set up formal sector briefing sessions (7th May in Manchester and 14th May in London)
- We organised a technical workshop to address the issue of sub-metering and base year PUE (2nd June in London)
- We set up CCA surgeries and one-to-one sessions with operators throughout the registration period
- We set up a CCA user group and established CCA webpages which we populated with guidance material: www.techuk.org/focus/programmes/data-centres/about_the_CCA
- We alerted operators to the free technical helpdesk and the generic CCA guidance material available:
  E techuk@slrconsulting.com
  T +44 (0)844 800 1880,
  W www.techuk.org/about-the-cca

- We produced bespoke guidance to address common issues that emerged during the registration process as follows:

  Note 01: How to avoid documentation delays
  Note 02: Handling base years later than 2011
  Note 03: Explaining the figures in your Underlying Agreement
  Note 04: Sub-metering
  Note 05: Measuring fuel to your generators
  Note 06: EUETS, CRC and CCA and, er, data centres
  Note 07: Who does what?
  Note 08: Buying green power

Looking ahead

While new applicants will be able to use the material we produced during the initial registration period, we plan to produce a few additional sets of guidance.

- The business case for participating in the CCA for data centres
- Generic notes on how to expedite the application process and what tends to hold it up
- The 70:30 rule explained (really explained!)

Anecdotal feedback

Here is some anecdotal feedback from the three main parties engaged in processing applications for the CCA: the operators, who have to prepare their applications, the technical helpdesk, who checks each application for completeness and evidence and prepares it for the EA Registry and the EA Facilitator who has to check and approve (or reject) each application.

"Most of the queries we raised related to 70:30, Directly Associated Activities (DAAs), flow diagrams and site plans. These were of very variable quality so operators need to provide clear, well annotated, properly cross-referenced documents to avoid delay".

"When operators did not measure the IT energy directly (in KWh) in the BY period and the operators used assumptions to evaluate this number, then they should have provided an explanation of the methodology and the calculations."

"Every facility in this sector will have backup generators and they have to report fuel usage. They need to tell us which methodology has been applied and it would be very useful if they can add a description on how the fuel has been estimated."

"Sometimes the description of the process was very general and exactly the same for every application. I know that there is not a lot to say about sending and receiving data, but it would be good to have a description of the process and of the site more tailored to the facility applying to join the scheme."

The EA Facilitator

"The submissions we achieved were very variable. One key thing was attention to detail in the drawings and plans. Some were clearly rushed through but the drawings require painstaking detail for instance the labelling in the site plan must match exactly to the evidence submitted for the 70:30 test – it must be possible to cross check and correlate both ways".

"The process descriptions were also very variable : there is no need for them to be complex: simple and logical is the best approach. The same applied to eligibility."

The technical helpdesk

"We found the process very time consuming: Each site was different but for a large complex site the amount of detail required in 70/30 split spreadsheet was time consuming and we also put considerable effort into revising our existing site plans to add the meter detail, label individual rooms and colour coding. It was not always clear what should be directly associated areas."
"In terms of process, think it was fine – we had expertise to pull from for existing CCA applications for different industries."

"We had a number of on-going queries, this being the first [time] we expected to take a while … but I think the proactive communications could have been better. Queries seemed to come sporadically… maybe worthwhile setting correct expectation on the lead times."

"Time input to compile the application documentation was a big drain on internal resources and much more significant than anticipated and finding out that we had to file the application by end of September to get through by end October did not help."

"We had been led to believe that the requirement for site drawings was quite basic and just representational. In practice the goal posts seemed to move and the detail actually required was much more significant and added more delay. More and more detail was being asked for throughout the process, especially on drawings."

"Conflicting information through the process added time to the 70/30 data gathering process. The same applied to acceptable methodologies for the measurement of diesel fuel."

"There is a lot of work to be undertaken which should not be underestimated… Regarding the data requirements, it's about getting the data into the presentable standard format, which takes a lot of time."

"On a practical front, it is unlikely that all areas within your site will be metered, so when you need to complete eligibility etc., it will take a lot of time to go round all the site and prove what you have."

"For us, the hardest requirement to meet was base year data where it wasn't metered monthly as a minimum, it's important that you get metering installed ASAP; the more metering you have the easier it will be".

"Establishing eligibility was fine for us, but there are specifics that you need to take into account, i.e. all your lighting etc so this can be a long manual process".

"Terminology was a little confusing but helped by the briefing meetings techUK provided. At first we didn't understand how all the parties fit together and how the process works - it would be ideal to have a flowchart and estimated timeline of all parties involved from start to finish."

The operators

Case study

Case Study: TelecityGroup: 13 sites, unassisted application

TelecityGroup has had an energy management system in place since 2009, based around the EU Code of Conduct best practices. All its UK data centres are certified as participants (or have applications pending) and the group has maintained detailed and consistent monthly energy consumption and performance data sets since the beginning of 2009. The group achieved ISO 14001 and Carbon Trust Standard (CTS) certification in 2010 and ISO 50001 in 2013 for all UK sites. TelecityGroup's energy consumption data sets have been compiled and formatted to support the compliance requirements of CRC, CTS and GHG reporting and as such have been externally audited annually since 2010. The group was therefore very well acquainted with fulfilling and documenting all kinds of regulatory and voluntary requirements.

TelecityGroup has also been engaged with techUK from the very start of the CCA negotiations so were well informed and well prepared for the scheme. Nevertheless the registration process involved far greater internal resource than anticipated and presented a number of very significant challenges which included:

- The very short registration window because the legislation was so late in coming into force
- The complexity of the application (13 sites with different base years in one "bubble")
- Greater detail demanded on application than had been indicated; for instance escalating levels of detail were required on site plans (eg exact location of gensets) which was inconsistent with the requirements in the published guidance material.
- Difficulties in establishing acceptable methodologies for measuring fuel to generators where the effort was disproportionate to the negligible energy impact.
- Sudden changes of definition regarding eligible functions (eg access corridors) which were only resolved at the last moment but would have meant repeating all the70:30 calculations.

How were these issues resolved? There was a balance to be struck between getting the application in quickly and ensuring that it fulfilled all technical and process requirements. In the event TelecityGroup focused on a high quality submission that would generate the lowest possible number of queries. TelecityGroup maintained an open dialogue with the technical helpdesk provided by Jacobs which enabled them to act on the most current advice available at the time, incorporating their feedback on what was acceptable. The group also maintained contact with techUK who were able to escalate and resolve issues that were causing disproportionate delay. In some cases TelecityGroup was able to provide evidence that the energy impact of an issue was negligible and thus warranted a pragmatic solution, at least temporarily.

Outcome: In the event, TelecityGroup's application was processed and approved and their CCA agreement issued comfortably ahead of the deadline and with a faster than average turnaround time. In fact, TelecityGroup was the only applicant that was uploaded to the Environment Agency Registry without the need for a single query or clarification. This was remarkable for a multi-site operation with facilities of different age and size and is a reflection of the accuracy and attention to detail evident in the submission.

V Strategic implications for the sector

This section takes a longer view of the implications of the CCA on the sector – on the UK market, on individual operators, on energy stewardship, on procurement, on policy dialogue and on achieving policy objectives in both the short and long term.

The CCA is an important milestone for the UK data centre sector because it is more than a tax concession. It is also formal recognition by government that the data centre sector exists and will be here for the foreseeable future, that it is important and that it is a significant contributor to the UK economy, to growth and jobs. The Chancellor has also recognised the importance of protecting future investment and growth by, at least partially, levelling the playing field for UK operators competing against overseas counterparts. DECC (the Department for Energy and Climate Change) has demonstrated that they can design, adapt and deliver intelligent policy tools that can drive carbon reductions whilst encouraging growth. By so doing they also demonstrate that there is not always a binary choice between carbon and growth. The CCA adds some much needed stability to the policy landscape and also, with data centres now firmly on the policy radar, will set the scene for constructive policy dialogue going forward.

We have chosen to look at the implications of the CCA from several perspectives. Firstly we look at impacts on the sector: how the CCA is likely to affect both the wider UK data centre market and individual facilities – especially the way that they use energy. Secondly we look at the policy impacts, by which we mean the effect the scheme is likely to have delivering policy objectives like emissions reductions. Will it be effective? We certainly hope so. These impacts are what we expect to see but in the main we will have to wait. However, anecdotal feedback from discussions with operators suggested that some impacts are already starting to be seen and these are also captured.

Impacts on the UK sector

1. Formal recognition of the sector by Government
2. Greater investor confidence
3. Increased consolidation
4. Improved competitiveness
5. Improved energy stewardship
6. A change in power purchasing preferences

1. Formal recognition of the sector by Government

As mentioned above, the successful negotiation of a CCA demonstrates that the existence of the data centre sector, and its contribution to the UK economy, has been recognised by Government and that we are now formally on the policy radar. This is already evident in new consultations and evidence gathering (eg for climate change resilience and non domestic energy use) where data centres are explicitly listed as target consultees.

2. Greater investor confidence

The CCA provides a greater degree of policy certainty for those wishing to invest in the UK sector and for UK operators considering expansion. Data centres are eye-wateringly complex and expensive to build and those who do so need to know that the business model they invest in will be competitive in five, ten or fifteen years' time. The UK's complex and volatile climate change policy landscape created uncertainty and cost and acted as a barrier to expansion and inward investment. The CCA will encourage greater confidence in the UK as a location of choice for data centres.

3. Increased consolidation

A CCA will encourage the consolidation of computing resource from a "distributed" model (servers in cupboards and box rooms) into larger, purpose built, efficient facilities. This single act can reduce energy demand by two thirds. To some extent it will also encourage outsourcing to third parties as companies reviewing their IT estate consider what to do with their server rooms and distributed computing assets. Levels of outsourcing in the UK are relatively low compared to other markets due to three factors – historic lack of availability, the predominance of the financial services market and a cultural reluctance to move servers out of immediate control - usually described as "server hugging". While the natural progression of the UK market is towards consolidation and outsourcing, the CCA is likely to accelerate this trend.

4. Improved competitiveness

With the capability to invest in energy efficiency measures, companies will be able to realise financial savings as their energy performance improves. This in turn makes them more competitive as they can deliver services to their customers at lower cost. They can also provide evidence of good energy stewardship which is increasingly becoming a requirement in procurements. Customers can also request that data centre operators participate in a CCA as a condition of service, driving competition on energy efficiency within the supply chain.

5. Improved energy stewardship

To date, CCAs have delivered greater energy savings among participating sectors than conventional policy measures would have achieved. Data centres will be no exception. This is because the CCA really does change behaviour. A bespoke policy tool like a CCA can at first glance seem to run counter to perceived wisdom, which takes the view that increasing energy costs forces people to take steps to improve efficiency – the basis of all "polluter pays" policy instruments. But if this theory worked in practice we would not smoke, drink or drive and a Saturday night spent in Reykjavik proves beyond a shadow of a doubt that exorbitant taxes on alcohol do little to modify behaviour. Instead the CCA provides compelling incentives to improve efficiency through a simultaneous carrot and stick – tough targets while providing companies with the means to invest in efficiency measures. We expect to see improved energy stewardship in the UK data centre sector being realised in the following ways:

- **Greater consistency in the way that PUE is measured in the sector:** There are around 70 different ways to measure PUE, and PUE has at times been mistakenly used as a marketing tool to make the case for one site over another. The CCA obliges operators to measure PUE on the basis of cumulative, annualised energy consumption by the site divided by that of the IT function (similar to Green Grid 2). Sub-metering is obligatory. The emphasis is on monitoring a site's performance against itself over time, which is in line with the correct application of the PUE metric. Should a more sophisticated productivity metric become available, this can be accommodated in the scheme.

- **A stronger business case for investing in efficiency measures:** Greater investment in efficiency measures because the rebate and incentives strengthen the business case. One-size-fits-all carbon taxes like the CRC and CCL operate on a polluter-pays basis, charging per tonne of carbon or per KWh of energy use. The problem for operators is that they have to set aside money to pay these taxes and as a result their obligations under CRC and CCL essentially tie up funding that could be used to make investments in energy efficiency – a frustrating paradox. The CCA discount dramatically strengthens the business case for implementing energy efficiency measures because that money can be reinvested.
- **A stimulus for the adoption of energy efficiency technologies within the sector:** The CCA efficiency targets are focused on the implementation of tried and trusted efficiency technologies and the increased uptake will in turn help drive the development of energy saving technologies and services relevant to data centres. The CCA is particularly suitable for an industry where technology is developing rapidly because it can drive innovation.
- **Greater collaboration, innovation and best practice:** The sector-based approach of a CCA promotes sharing of information and best practice within the industry. Other instruments lack frameworks to encourage collaboration of this type.
- **Greater flexibility in addressing sector specific issues:** CCAs are flexible enough to take into account sector characteristics. A data centre comprises a complex array of different technologies and a system level approach is needed when implementing efficiency improvements.

6. A change in power purchasing preferences

In recent years many operators have opted to purchase "green" power. Companies usually pay a premium to their energy supplier for this energy but they can exempt these purchases from CCL via Levy Exemption Certificates (LECs). The CCA provides a 90% rebate on the CCL but this rebate is not payable on green power for the simple reason that you cannot claim a rebate for something you haven't paid. This creates a slight disincentive to buy green power and therefore an incentive for operators participating in the scheme to revert to grid normal.

Under current circumstances buying green power in this way in the UK makes no additional contribution to renewable generation and we would prefer to see operators focusing on energy efficiency, good energy stewardship and net reductions rather than on the colour of their supply.[9]

We anticipate that those operators who have made long term CSR commitments or formal undertakings to customers to buy green power will continue to do so but we expect other operators to opt for grid average or a mixed supply.

Green Stuff: The Green Power Conundrum
Some observers view this as a perverse incentive of the CCA but it is nothing of the kind. The policy objectives of the CCA do not include changing the generating mix; they are primarily concerned with energy efficiency: to reduce net energy demand or minimise the energy required for a given function and in turn lessen the burden on generating capacity. Opting for green power does not reduce energy demand or encourage behaviour change or good energy stewardship. Moreover, buying green power in this way in the UK energy market does not drive investment in renewables and has no impact on our generating mix. That is done through the Renewables Obligation (RO) and other schemes paid at the point of generation. And of course this "green" power is no different from any other power supplied through the grid because you cannot separate power by type at point of delivery.

9 See our briefing note: Green Power Decisions

CCA impacts on delivering policy objectives

1. Reduced carbon leakage
2. Greater certainty of meeting policy objectives
3. Fewer perverse incentives
4. Greater reach for the policy instrument
5. Support for other UK carbon reduction initiatives

The purpose of the CCA is not to give energy intensive businesses a free ride when it comes to carbon taxes. It is a policy tool explicitly intended to improve energy efficiency and drive carbon reduction. As such it has to try and reconcile a number of conflicting problems. We are at a critical point on the climate change agenda, it is essential that we meet our carbon reduction targets; all sectors must contribute by improving efficiency.

At the same time, unilateral carbon and energy taxes handicap energy intensive industries in their efforts to compete with overseas counterparts who are not under similar regulatory or financial constraints. Moreover, ill-informed policy tools have the potential to drive business out of the UK and cause carbon leakage unless intelligently applied.

There is a third factor: while the ICT and ICT-enabled technologies that data centres deliver have an important role to play in reducing net carbon emissions, the emissions attributable to our sector are growing.

We see several ways in which the CCA stands out from other policy tools in terms of achieving balance on this problematic but important agenda.

Green Stuff: Why do we need climate change policy?
Climate change is a classic EXTERNALITY. EXTERNALITIES are symptoms of MARKET FAILURE where market forces will not address problems that impose social costs. MARKET FAILURE requires MARKET INTERVENTION. Market intervention involves POLICY INSTRUMENTS. Policy instruments can be:
o COMMAND AND CONTROL (eg minimum standards, outright bans - "Thou Shalt Not")
o POLLUTER PAYS (the more you use, the more it costs). CCL and CRC are typical polluter pays measures)

1. Reduced carbon leakage

Carbon leakage is an unwelcome side effect of unilateral carbon taxation or regulation. Because energy is such a predominant cost for data centres and because data is so easily transmitted over long distances, data centres are very susceptible to carbon leakage (where energy intensive organisation locate their operations overseas to avoid carbon taxation and end up in less regulated areas where the generation mix may be more carbon intensive). The CCA provides policy stability and some relief from unilateral carbon taxes that might otherwise encourage offshoring.

2. Greater certainty of meeting policy objectives

The clear target set in a CCA provides much more clarity of final outcome than an uncapped CRC or other polluter pays mechanisms like CCL, or a scheme like ESOS that obliges companies to undertake audits but does not require them to implement the findings. It gives the potential for government to set stringent targets taking the unusual circumstances of data centres into account (e.g. fast equipment replacement rate). Regular review of progress towards targets and, if required, target renegotiation will ensure that a data centres CCA is delivering against its objectives.

3. Fewer perverse incentives

Because the CCA rewards energy efficiency rather than demanding simple net reductions it encourages the flow of work to where it can be done most efficiently, making those efficient companies more competitive. It therefore works in the opposite way to, say, CRC which actually penalises those companies that grow. Unlike those one-size-fits-all approaches, the CCA applies bespoke targets that are designed to drive change where it is most needed and can be adjusted or escalated if need be.

4. Greater reach for the policy instrument

The CCA is open to operators that fall below the threshold for other policy measures such as CRC or GHG accounting or ESOS, so as a policy tool it has wider reach than those approaches. The CCA will therefore provide energy efficiency targets for organisations that are currently under the regulatory radar, thus widening the pool for achieving carbon reductions.

5. Support for other UK carbon reduction initiatives

Data centres underpin the transition to a low carbon economy: they enable smart grid, smart cities, broadband and a huge range of ICT-enabled low carbon technologies from vehicle logistics to teleworking, from earth surface monitoring to building management systems. The more efficient our data centre functions are, the more compelling these alternative, dematerialised, approaches become.

Early indicators: Anecdotal feedback

Although we have not yet started the reporting process, a preliminary analysis of the initial data sets and anecdotal feedback from participants and their customers is instructive. It is clear that the scheme is already stimulating some behaviour changes, not just in terms of standardising the way PUE is measured but in terms of dialogue and public positioning. We thought we detected four trends:

1. More open operator-customer dialogue
2. PUE revealed
3. Standardised metering
4. Better macro-level information on sector energy consumption

1. Operator-customer dialogue

We have both colocation operators and their customers in techUK membership and the CCA has been a regular topic of conversation point for some time. We are already seeing some early indications that customers perceive the CCA as a recognised route to good energy stewardship. Unsurprisingly customers also welcome the increased transparency it will confer on energy use and look forward to benefiting from reduced energy costs so they are asking operators to participate and pass back the benefits. Operators are explicitly undertaking to do this and also making a public commitment to meeting the objectives of the scheme. We understand anecdotally that as a result some operators and customers are maintaining a more open dialogue. We will monitor this space.

2. PUE revealed

Although most participants have long measured their PUE robustly a few had not and were rather surprised when they found out the truth. While all operators are aware of their design PUE not all had measured their real, operational PUE.

3. Standardised metering

As a condition of entry operators have to implement permanent sub-metering. This has been done across the board with no exceptions and all scheme participants now measure cumulative energy to the IT and calculate PUE accordingly.

4. Sector energy consumption

As the Fast Facts section revealed, for the first time we are starting to see real data on the energy consumption of the sector. This is not complete, firstly because there are some residual sites yet to enter the scheme and secondly because the enterprise cohort of operators is currently excluded. Despite this, the data is giving us unprecedented insight into the amount of energy that the sector consumes and places us in a much better position to estimate total sector energy consumption than hitherto. As the scheme progresses we will build on this knowledge further.

VI How we see the CCA developing ... in an ideal world

This final section looks ahead at the way that we see the CCA developing in future, given continuing policy stability in this area. It includes thoughts on expanding the scheme to enterprise operators, using data from the scheme to inform policy dialogue going forward, improving our understanding of the sector and fostering best practice through collaboration with existing industry initiatives.

It is very early days to comment on the future of the data centres Climate Change Agreement. Although the agreement does provide some degree of policy stability, nothing is cast in stone and all such tools are to some extent vulnerable to major upheavals in the wider policy landscape (the recent development relating to EU ETS and CRC[10] being a case in point) or to large scale revisions of domestic policy resulting from new political priorities or a change of government.

However, all being well, there is scope to make a few brief points about the way we see the CCA developing in future. There are four main areas of opportunity:

1. Informing the policy dialogue
2. Expanding the scheme to enterprise operators
3. Improving our understanding of energy use in the sector
4. Improving best practice through collaboration

Informing the policy dialogue

Feedback from policy tools like the CCA can be instrumental in helping policy makers understand sectors better and we are in a perfect position to aggregate and present that intelligence to government and ensure that the policy process is properly informed. We see two opportunities here: firstly in terms of understanding and communicating the effectiveness of the CCA in driving behaviour change and good energy stewardship in the sector and secondly in terms of the way that operators perceive the UK as a place to do business – to locate new facilities or expand their operations.

So we will be monitoring the sector very closely in terms of energy stewardship and the way that the CCA is driving behaviour change in the sector. We know what we expect to see but we need to find out if it is borne out by evidence.

Green Stuff: What's all this about EU ETS and CRC and CCA?
When CRC was simplified the policy objective was to ensure that a site was not required to comply with multiple regulations, so energy to sites obliged under EU ETS should be exempt from CRC. The new CRC legislation was not implemented this way, however, and restricted the definition to EU ETS installations (which could just be the generators) rather than sites. Late in 2014 it was confirmed by the EA that energy to sites obliged under EU ETS would indeed be exempt from CRC. This means that CCA participants with EUETS sites should be able to backdate their CRC exemption. More importantly it provides a route out of CRC for EU ETS sites not eligible for the CCA. CRC legislation is notoriously unstable so watch this space carefully!

10 See our briefing: EU ETS, CRC, CCA and er, Data Centres

Data centres are unusual in that the sector has seen more significant growth than perhaps any other CCA sector over the last few years and is also one of the most location agnostic sectors: unlike manufacturing industry where products need to be transported physically to their markets, data is the most mobile commodity on earth and can be transported at almost negligible cost and with almost negligible delay. Although some data centre services are very location sensitive, many are not, especially those where there is greatest growth potential, such as cloud. So the sector is perhaps the best placed of any CCA sector to act as a barometer for the effectiveness of the policy tool in terms of protecting UK competitiveness. This will not be a straightforward exercise but we will look at both sector level data and anecdotal feedback from individual operators.

Expanding the scheme to enterprise operators

Now the scheme is up and running our next step is to start exploring the possibility of expanding it to include enterprise operators, or at least a cohort of enterprise providers. This will involve similar negotiations to those conducted for the colocation providers and we will need to demonstrate three things: the value of this part of the sector to the UK economy, its vulnerability to overseas competition and the energy intensity of the activity. As before the process will be evidence based. If you are an enterprise operator then please get in touch; we will need to engage the industry in the negotiations.

Improving our understanding of the sector's use of energy

As mentioned above, the CCA provides us with an invaluable source of real data about the sector and we plan to make good use of this moving forward. Government publishes the same level of data about the CCA as it does for CRC: participants, site numbers, energy passing through the scheme and recorded improvements. However, as the sector association we can add industry-specific insights. As a result we will have information about the sector and its use of energy that has simply not been available before.

For instance in the past it has been notoriously difficult to get a realistic estimate of gross energy use in the sector. This is partly due to confusion between power provisioning and actual energy use and the leasing business model which tends to result in the duplication of site data when different operators all report figures for the same facility. The CCA will create a robust evidence base because, for the first time, we will have an accurate picture of sector energy use. This will become a vital tool to monitor sector level improvement, to highlight differences in efficiency across the sector and to identify how best to drive a continuous cycle of improvement.

Improving best practice through collaboration

We have the opportunity to work with organisations that have developed industry best practice tools such as the EU Code of Conduct for Data Centres and The Green Grid. The CCA is a "live" policy tool and can accommodate industry led approaches to deliver the efficiency improvements required under the terms of the scheme.

Annexe: CCA information sources

CCA contacts

- For CCA queries relating to policy please contact emma.fryer@techuk.org
- To participate in the CCA contact our helpdesk: T +44 (0)844 800 1880
- E techUK@slrconsulting.com
- techUK “About the CCA” webpage
- Environment Agency CCA webpages: https://www.gov.uk/climate-change-agreements--2

CCA guidance materials specific to data centres

- What’s a CCA?
- Am I eligible? CCA Decision Tree
- What are the benefits? CBRE CCA Ready Reckoner (instant rebate calculator)
- How to apply: Slide set from sector briefing sessions
- Data Centre CCL website: W www.techuk.org/about-the-cca
- Do I need an energy consultant for the CCA?

CCA guidance notes available or coming soon

GN1: An introduction to CCAs
GN2: What is eligible to be in a CCA?
GN3: How do I set up a CCA?
GN4: CCA conversion factors
GN5: CCA Administration charges
GN6: Claiming the CCL discount
GN7: Reporting changes
GN8: Managing and maintaining your CCA
GN9: Reporting target period data
GN10: metering and measuring requirements
GN11: Preparing for audit
GN12: Glossary of CCA terms

Ad hoc notes to clarify common issues specific to data centres

See www.techuk.org/insights/reports/item/2071-data-centre-cca-common-issues

- Note 01: How to avoid documentation delays
- Note 02: Handling base years later than 2011
- Note 03: Explaining the figures in your Underlying Agreement
- Note 04: Sub-metering
- Note 05: Measuring fuel to your generators
- Note 06: EUETS, CRC and CCA and, er, data centres
- Note 07: Who does what?
- Note 08: Buying green power

Coming soon

- The 70:30 Rule for Tiny Tots
- How to make the business case for CCA participation
- What speeds up your CCA application and what slows it down

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Links

Data centre programme pages: www.techuk.org/datacentres
Data centre publications: www.techuk.org/datacentrepublications (scroll down all the way to the pink bars to activate links)

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About techUK's data centres programme

techUK is proud to represent the UK data centre sector and offers a comprehensive and influential programme of activity. Our objective is to ensure that the UK continues to offer a business and regulatory environment in which the sector can flourish. We specialise in matters relating to public policy, regulation, reputation, professionalism and energy efficiency.

techUK Data Centres Council: techUK's Data Centres Council was established in 2009 as the UK Council of Data Centre Operators and is a decision making body that sets strategic direction, defines the outputs that techUK will develop on behalf of the sector and agrees the level of our external stakeholder engagement. The Council is chaired by Andrew Jay of CBRE and the vice chair is Rob Coupland of TelecityGroup. The Council is supported by a Technical Committee, chaired by Professor Ian Bitterlin, which provides expert technical input.

techUK Data Centres Group: Our data centre interest group comprises over 400 members from across the industry. These include data centre operators (both colocation and enterprise providers) companies who manufacture the IT and communications hardware that occupy these facilities, those in the data centre supply chain, and customers, who either lease space for their own corporate function or sell services from the data centre. Specialist activities are devolved to sub-groups.

Achievements to date

1. **Negotiated a Climate Change Agreement (CCA) for Data Centres:** The work to negotiate a CCA was initiated by the Data Centre Council with the BCS in 2010. Brought into law on 1st July 2014 after four years of negotiation, it represents approximately £170M of savings to the UK data centre sector.

2. **Achieved recognition for the UK data centre sector:** techUK has played a leading role in ensuring that the data centre industry is recognised as a key priority sector by government.

3. **Mitigated policy impacts:** techUK has produced over thirty policy responses and position papers, principally addressing the shortcomings of UK energy and climate change policy in relation to data centres, and has achieved a number of important concessions for the industry.

4. **Informed the policy process:** techUK has fostered engagement with BIS, Treasury, DEFRA, Cabinet Office and DECC to help policy makers understand the sector and ensure that the policy process is adequately informed. As a result data centres are now firmly on the policy radar.

5. **Provided a route for driving professionalism in the sector:** techUK and the IET have created a well-defined route to professional registration for technical staff working in data centres.

6. **Protected the sector's reputation:** techUK has produced timely, accurate and well-argued responses to misleading coverage of the sector in the media.

7. **Demystified the sector to external stakeholders:** techUK has produced a range of documents from thought leadership pieces that position the sector in the digital economy to beginners' guides that explain the sector in layman's terms – "Data Centres for Tiny Tots".

techUK represents the companies and technologies that are defining today the world that we will live in tomorrow.

More than 850 companies are members of techUK. Collectively they employ more than 500,000 people, about half of all tech sector jobs in the UK. These companies range from leading FTSE 100 companies to new innovative start-ups. The majority of our members are small and medium sized businesses.

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