Input to the DG CONNECT workshop on KPIs for Green Data Centres

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techUK represents the technology sector in the UK. Our members include data centre operators, both colocation and enterprise providers, companies who manufacture the IT and communications hardware that occupy these facilities and others in the data centre supply chain. The UK has the largest data centre market in Europe by a significant margin and as a result we take a close interest in policy developments impacting our members. With this in mind we submit the following comments in response to the proposed KPIs for green data centres for discussion at the Commission workshop on 1st April.

We are pleased to learn that this is an exploratory exercise to examine pros and cons rather than a leap of faith into a complex technical landscape. We look forward to an open and transparent dialogue with DG CONNECT and other stakeholders on this important topic, since well-informed and appropriate policy will be essential to the future of the data centre sector in Europe and to the jobs and growth that it underpins.

We have some generic comments to make and also some very brief comments on the proposals.

Generic comments

Policy attention is inevitable

We accept that growing recognition of the infrastructural and economic role of data centres will go hand in hand with greater scrutiny. As a result we anticipate that the sector will, increasingly, become the focus of policy makers. Our intention is not to resist policy instruments *per se* but to work with stakeholders to ensure that those instruments, whether mandatory or voluntary, are only applied when necessary, that they build on existing approaches rather than creating new ones, and that they are fit for purpose. By this we mean that the implementation reflects the policy intention and does not lead to unintended consequences like perverse incentives, market distortion or carbon leakage. Most importantly, for a location agnostic, energy intensive sector with significant growth potential, policy approaches should not make the EU an unattractive location for investment compared to other regions.

Although relatively new, the data centre sector has an unparalleled history of developing exceptionally advanced energy monitoring and efficiency tools that successfully drive good energy stewardship within its complex and multi-layered facilities. Moreover, its voluntary assessment regimes are capable of accommodating the rapid evolution in technology that characterises this sector without creating bottlenecks or distorting technology development.

Because it is a highly energy intensive sector there are also very strong market and commercial drivers for improving energy efficiency in data centre facilities. While nobody pretends that energy use is perfect (that is why there is so much focus on improvement!) policy instruments must take advantage of market forces and build on the key strengths of existing tools, not ignore them.

But data centres are already regulated

Regulatory attention is not new to data centre operators. As well as an array of UK and EU environmental legislation aimed at corporate level (CRC, CCL and mandatory carbon accounting) or

facility level (EUETS) there is a wide range of tools, standards and assessment methods currently focused on both the ICT hardware and the mechanical and engineering (M&E) infrastructure that supports it.

So new policy measures need to focus on the parts that existing regulations don't reach

This indicates that approaches to drive improved efficiency in data centres must be aimed at the operational level rather than the hardware or supporting infrastructure. A data centre is a complex arrangement of different physical assets and its efficiency depends not just on the energy performance of the individual assets but on the way those assets interact – i.e. the way it is designed and operated. There seems little point in directing new policy measures at data centre hardware or infrastructure components because they are either already covered individually by regulation, or if not, the existing regulatory framework provides the means to address efficiency issues in new devices and other hardware that is not already within scope.

And where market forces are not driving improvements far or fast enough

At the highly commoditised end of the data centre market the financial incentives to optimise efficiency are overwhelming. That's why Google, eBay, Facebook and Amazon operate large scale, ultra efficient data centres with extremely short server refresh rates[1]. Sweating hardware assets in the way that many governments advocate would be counter-productive and it is difficult to see how any kind of regulation would deliver improvements in the environmental performance of these types of facilities. So policy measures need to address the other end of the market, especially where energy costs are less transparent (for instance in organisations where the IT department does not have responsibility for the facilities bill) or where energy costs are not a high proportion of total company turnover, or where for some other reason efficiency at facility level is not adequately incentivised.

Holistic approaches at the system level are proposed (good) but the current review omits the Commission's own tool (not so good)

As the Maki report correctly observes, we need a holistic approach. This needs to drive efficiency in handling, processing and storing data so that information processing becomes more productive, secure and available – which in turn improves resource efficiencies in the wider economy.

Unfortunately the report omits to include the European Code of Conduct for Data Centres, the Commission's own tool for improving energy efficiency at the operational level. This is a major oversight because the Code is widely acknowledged to be the best tool on the market for improving energy management in data centres. It was set up some years ago and is free to use. Over 250 data centres are participants to the Code, including pretty much all the major European data centre operators. In reality, however, the tools and guidance are applied much more widely across the whole industry. There would be even higher levels of formal adoption if the Code were adequately resourced.

Moreover, since its creation the Code has become the basis for a wide range of subsequent initiatives and voluntary standards relating to good energy management in data centres and others

[1] This doesn't necessarily mean that servers are replaced wholesale but that the motherboard (including the central processing unit) is replaced to reap the energy benefits of the continued evolution of the sector in line with Moore's Law. Other types of computing hardware have different life expectancy so approaches have to be tailored around IT function.

have been developed for compatibility with it. These include ITU L.1300 best practices for data centres, Singapore's SS 564 for green data centres and the Green Grid's Maturity Model. It has been translated into Japanese and Korean for use in those markets and the Chinese are considering adopting it. It has already been adopted in UK government procurement guidelines. In the EU, BREEAM has developed a separate building class for data centres which is largely based on the Code.

While the Code itself does not include an auditing process it can be accommodated into audited standards like ISO 50001 (a number of operators already do this very effectively) or form the basis of an audit process such as CEEDA.

So what we would recommend is...

Build on what is already there: If the objective is to improve the transparency of energy performance then all the necessary tools already exist - they just need to be deployed. International and technical groups are already addressing a number of aspects ranging from reuse of waste heat to measuring productivity. The key priority should be to channel the effort towards expanding the capabilities of mechanisms already in play.

Learn lessons from previous policy failures: the UK applied a one-size-fits-all regulatory approach (the CRC) to data centres but instead of driving efficiency it created perverse incentives, market distortion and economic damage. Across the EU the application of the ETS to data centres, where administration costs are between 20 and 100 times the cost of carbon allowances, delivers no policy outcome, demonstrates policy dysfunction and undermines trust in the wider green policy agenda.

Comments on the proposed KPI options, 1, 2 and 3

We have avoided making detailed comments on the KPIs since these are likely to duplicate the technical contribution from individuals attending who are expert in standards development. The following are topline observations.

KPI 1: "green" power

Two comments here:

- Firstly, work is already underway on such a metric through ISO/ IEC SC39. Why reinvent the wheel?
- Secondly we have some reservations about the approach. "Green" power is often a misnomer and our concern here is that a green energy KPI allows data centres to appear to be reducing their environmental impacts when in fact they are simply shifting the burden. While it may be useful to make the energy mix more transparent we would prioritise KPIs that genuinely drive improvements in energy stewardship and operational efficiency. If green power KPIs promoted self generation and a genuine demand for renewable power then they would be justifiable. However we are concerned that incentives for data centres to buy "green" power from their grid supplier, whilst making it unavailable to others, is not necessarily a stimulant to greater renewable generation. There is also a risk that in the medium term such an approach could be discredited in the same way that carbon offsets have been.

KPI 2: Modified DCeP, etc.

Three comments here:

- Firstly we agree that more than one metric is needed but we believe that the technical performance of the data centre should be of primary importance, with energy reuse next, unless the green energy metric avoids the pitfalls that we identified above.
- Secondly we observe that the basis for such KPIs already exists in terms of practices and frameworks for development and delivery in the form of the EU Code of Conduct and the Green Grid.
- Thirdly, even with point two in mind, we feel that the timelines are unrealistic for this work.

KPI 3: Data centre specific PEF

We have two comments here:

- Firstly we feel that the timelines are very optimistic for this work, especially in view of the complexity of the data centre at both physical and operational levels.
- Secondly, regarding life cycle based performance indicators. We have significant concerns, not about the value of looking at environmental impacts over the life cycle of a product, facility or service, but about the scope for the resulting information to be misused. LCA / PEF based approaches were designed to identify hotspots in product lifecycles to enable companies to direct mitigation efforts at the point in the process where they could deliver most benefit. LCA also enables organisations to look at performance over time. LCA / PEF approaches were not designed, and are inappropriate for, comparing complex products or services at point of purchase/use. The results of the previous round of PEF pilots evidenced this. The issue is also covered in numerous industry reports[2].

We do hope these comments are helpful. If you need further information or clarification please do not hesitate to get in touch. Contact details are below.

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techUK represents the technology sector in the UK. This includes information and communications technologies (ICT) and consumer electronics (CE) sectors, including defence and space-related IT. Collectively this sector now employs well over 1 million people and contributes around 10% of UK GDP. techUK has over 850 members ranging from start-ups to leading FTSE 100 companies. The majority of our members are SMEs.

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2 See **ANEC, 2012:** Environmental Assessment Goes Astray: a Critique of Environmental Footprint Methodology and its Ingredients http://www.anec.eu/attachments/ANEC-ENV-2012-G-008final%20(3).pdf and **Intellect 2012:** Evaluating the carbon impact of ICT: The answer to Life, the Universe and Everything: understanding the limitations of LCA based footprinting methodologies. http://www.techuk.org/insights/reports/item/459-evaluating-the-carbon-impact-of-ict-or-the-answer-to-life-the-universe-and-everything