Scotland's climate coalition

Stop Climate Chaos Scotland response
Detailed Call for Evidence - Hyperscale Data Centres
Climate Action Committee
11/11/26

About us: Stop Climate Chaos Scotland (SCCS) is Scotland's climate coalition, bringing together over 70 civil society organisations campaigning together on climate change. Together, we represent hundreds of thousands of people across Scotland and stand in solidarity with communities most affected by climate impacts around the world. We encourage decisionmakers to deliver fair, fast, funded policies to reduce emissions.

1. **What are the potential environmental impacts of the construction and operation of hyperscale data centres and opportunities to deliver environmental benefits including:**
    - water quality and consumption
    - air quality
    - nature and biodiversity, including soil quality
    - noise pollution
    - energy use and reuse, and associated generation (including of back up generation)
    - emissions, and where emissions could be avoided by, for example, using waste heat
    - temperature changes around hyperscale data centres

Our coalition has severe concerns about the environmental impacts of the operation of hyperscale data centres in Scotland, primarily due to their high energy demand and the high likelihood of increased greenhouse gas emissions.

The total energy demand from 23 proposed applications would be 7.3GW (according to publicly available information, primarily from planning portals), or 8.9GW according to the National Electricity System Operator, NESO. This would more than double Scotland's peak winter electricity demand, which is currently just over 4GW.

The biggest proposed data centre, at Chapelcross, would have a 1GW demand for energy. Torness nuclear power station has a capacity of 1.364 GW. So this data centre would require almost a whole nuclear power station to feed its demand for energy. Clearly this is not sustainable.

All energy generation has an environmental impact. Whether it is renewables or fossil fuels, the infrastructure takes up land or seabed space, impacting on wildlife and nature, and taking up space which could otherwise be used for carbon sequestration and/or nature restoration (this is in addition to the impact on communities, and the impact on our climate through emissions from non-renewable energy).

The developer of the proposed Chapelhall hyperscale data centre in the Lanarkshire AI Growth Zone says that they will build 1GW of renewable energy and 2,400MWh of battery storage, to provide half of the power that the data centre requires. Our member APRS have calculated that the 1GW of renewables would require 100 square kilometers of land, and the battery energy storage system would cover around 29 hectares.

Given the environmental impact of energy, Scotland should consider how much energy we want to produce and consume in this country, rather than seeing it as an infinite resource. How much is enough? If hyperscale data centres will push our total energy use above that threshold, then they are unsustainable.

It should be noted that our electricity use is projected to rise from 22 TWh in 2022 to 37 TWh by 2035, as we decarbonise and electrify our economy and our daily lives. We need to generate (or import) enough renewable electricity to heat our homes, to charge our EVs and electric buses, and to power our clean industry (e.g. steelmaking with electric arc furnaces). These important aspects of our lives and our economy should get priority for renewable electricity, before any of this valuable resource goes to hyperscale data centres, which are much less essential for ordinary people's lives and the economy.

However, we fear that the enormous energy demand from hyperscale data centres calls into question our country's ability to fully electrify home heating, transport and industry as required by the Climate Change Plan.

Hyperscale data centres' constant and very high energy demands would make it almost impossible to decarbonise our national grid. As they need to run around the clock, they usually require diesel or gas backup generators. The proposed development at South Gyle, Edinburgh, would require backup diesel generation

equivalent to over 100,000 diesel cars, with severe impacts on emissions and air quality.

The EIA for Chapelcross says it will cause 23 million tonnes of CO2e, which is more than half of the new Jackdaw gas field's projected emissions. The majority of these emissions would come from the construction and disposal of the servers, which would need changed several times. Again, clearly this is unsustainable, if the emissions from just one data centre are equivalent to half of a whole new gas field.

Dr Hannah Daly's study on data centres in the context of Ireland's carbon budgets states that: "Dozens of data centres have secured or are seeking **connections to the natural gas network** to overcome local power network constraints. On-site generation of electricity with natural gas less efficient than grid-scale generation, **further increasing emissions intensity, and will sustain fossil fuel demand**. Current national energy demand and GHG projections underestimate the impact of gas demand, as emissions from on-site generation are not fully accounted for, **creating a significant blind spot in Ireland's climate action planning."** (My emphasis.)

The Chapelcross EIA estimates that average annual domestic emissions (from powering the data centre) will be 75 ktCO2e per year. However, this assumes a strong growth in renewable energy production. AI Data centres will create additional demand for power that is most likely to be met by fossil fuels, therefore it is more accurate to use the current UK grid carbon intensity factor to estimate their carbon impact than assume 100% renewable supply. When the current UK grid carbon intensity factor is used, the annual impact from Chapelcross jumps to 1.55MtCO2e a year, which would add 4% to today's Scottish annual emissions. This is almost as large as the emissions from the whole of the NHS in Scotland.

If all 23 proposals were constructed, total emissions would be around 14MtCO2e a year, an increase of 36% on Scotland's 2024 total emissions – at a time when we are supposed to be reducing emissions by several per cent a year. Data centres would become the largest single sector of emissions for the Scottish economy.

Finally, all of these environmental impacts are likely to increase over time, if AI continues to be scaled up. Tech companies require increasing amounts of 'compute power' for their AI models to be competitive and keep attracting investment. The main way for AI to be better is for it to be bigger (requiring more compute power). This means that more and more land, energy, water and other resources will be required to keep feeding the arms race amongst AI models.

Given the scale of the projected environmental impacts, in addition to the impact on communities, we urge the Committee to call on the Scottish Government to hold a formal public consultation on Scotland's position on hyperscale data centres: do we want and need them, and if so, how much data centre capacity do we want and need in Scotland, and what level of impact on the environment and communities should be accepted?

2. **What systems are, or should be, in place to support avoidance or mitigation of negative environmental impacts?**

Before lifting the 'pause' on hyperscale data centres being determined, the Scottish Government should take the following actions to avoid or mitigate negative environmental impacts.

The Scottish Government should commission an independent analysis of the impact of hyperscale data centres on Scotland's grid and route to net zero. The Chair of this process must be independent, objective and hold expertise on the environmental and social concerns around data centres. The analysis should:

- List all data centre developments being considered in Scotland, including their location, expected capacity, and developers. This includes all applications at the planning, pre-planning, scoping or screening stage, plus any that have a grid connection offer (but are not in planning yet) or have been notified to Councils.
- Assess the impact of hyperscale data centres (individually and cumulatively) on Scotland's ability to meet its legally set net zero target and Scotland's 5-yearly carbon budgets.
- Assess the demand on the National Grid created by hyperscale data centres (individually and cumulatively) and how this will be managed alongside plans for electrifying and decarbonising heating, transport and industry.
- Assess the additional energy infrastructure that would be required to power all hyperscale data centres under consideration, and the cumulative environmental, social and economic impacts this would bring. This should include understanding the demand of material impacts in supply chains, to align with the requirements of the Scottish Government's Circular Economy Strategy.

The Scottish Government should require all data centres over 50MW to report regularly and transparently on water usage, energy usage, waste heat, and discharge of other pollutants (e.g. refrigerants, exhaust gases and PFAS 'forever chemicals'). If the reported levels are higher than deemed acceptable, the data centre should have to reduce its impact or stop running. The 'acceptable' levels of these environmental impacts should be set out by the Scottish Government before approving any data centres; this should include 'acceptable' levels for individual data centres and for the cumulative impact across all hyperscale data centres.

Any approval of hyperscale data centres should be conditional on the building providing waste heat to a heat network for heating homes and other buildings from day one of operations. This would offset the energy that would otherwise be required to heat those homes and buildings. However, promises to dispose of waste heat in this way should not be seen as justification for approving hyperscale data centres, as it does not address the other concerns around environmental impact and extreme levels of energy use.

Any approvals should also include a requirement for the developer to restore the land the data centre in built on, after the data centre stops operating, or if it never starts. Developers should be required to buy remediation bonds as insurance against going out of business, so the risk doesn't fall to the public purse.

Finally, we would expect that the national planning guidance which the Scottish Government produces will encourage data centre developers to submit *full* planning applications. Currently, many applications for in-principle permission provide insufficient detail. Local planning authorities should be encouraged to use their power to request further information from applicants in order to determine applications, especially if Planning Permission in Principle applications continue to be submitted. The planning guidance should speak to the effective use of planning conditions to control environmental harms and negative impacts on community health and wellbeing, and how these will be monitored and enforced, as well as the delivery of local and national community benefits (e.g. contributions to the ScotWind Wealth Fund).

3. **What can Scotland learn from other countries on the environmental impacts of hyperscale data centres?**

In an article for the British Medical Journal, Julie McNamara from the Union of Concerned Scientists spells out what has happened in the US.

On noise: "Communities near data centres report being plagued by the unrelenting noise of operations, which can disrupt sleep, affect mental health and cognitive functioning, and lead to overall poorer quality of life and wellbeing…"

On water: "Data centre water use is already straining and degrading local water systems and infrastructure, especially in water stressed places. Globally, data centre related direct and indirect water consumption is estimated to more than double between 2023 and 2030, reaching about 1200 billion litres annually by 2030. Lack of transparency around facility water use has persistently exacerbated water related challenges."

On energy: "Individual facilities now have energy demands equivalent to entire cities, and record shattering multi-gigawatt project announcements have come one after the next. This rapidly surging energy demand is driving an increased reliance on fossil fuels, and with it, an increase in all their attendant harms."

On air pollution: "Diesel generators, which are commonly relied on for backup power and can number in the hundreds per single facility, emit a variety of hazardous air pollutants; they can quickly become the largest local source of air pollution in a community. Some data centre projects are moving to install their own power plants onsite to sidestep growing electricity grid constraints—and often, that means turning to natural gas. Flagrant misuses of power are evident, such as by SpaceXAI, which trucked in dozens of illegal, highly polluting turbines to power a massive new data centre complex in the southeastern US."

We urge the committee to consider the impact of AI data centre growth in Ireland most seriously, given the similarities between Scotland and Ireland's energy systems. We refer the committee to the evidence provided by Rosi Leonard from Friends of the Earth Ireland and Hannah Daly from University College Cork on this matter.

4. **How building and running hyperscale data centres in Scotland might impact on achieving climate and nature goals?**

The EIA for Chapelcross says it will cause 23 million tonnes of CO2e, which is more than half of the new Jackdaw gas field's projected emissions.

The ability to stay within Scotland's carbon budgets would be directly undermined by the approval of any hyperscale data centre which will produce that level of emissions, or by several smaller hyperscale data centres.

Scotland's total carbon budget between 2026 and 2045 is 406MtCO2e, spread across four five-year budgets. In the worst case, where hyperscale data centres caused the reduction in grid carbon intensity to stall, total data centre emissions from 2030 to 2045 would be 208MtCO2e, using up more than half of Scotland's total carbon budget.

Their approval would also undermine Scotland's ability to implement the Climate Change Plan, since they put at risk our ability to produce and retain enough renewable electricity to decarbonise heating, transport and industry as well as powering ravenous data centres.

However, the impact of hyperscale data centres is not included in the Scottish Government's Climate Change Plan, which sets out Scotland's pathway to net zero by 2045. There must be a serious assessment of how any hyperscale data centres would impact on Scotland's ability to deliver the Climate Change Plan, including any consequent emissions reductions which would be required in other sectors, should any number of hyperscale data centres be built.

Further, since building hyperscale data centres requires large quantities of critical minerals and metals, it is not aligned with the Circular Economy Strategy's goal of achieving sustainable levels of material use by 2045. It would also run counter to the Strategy's aim to "reduce dependence on international supply chains for CRM".

5. **What criteria should a hyperscale data centre meet in order to be considered "green"?**

Whilst we believe that hyperscale data centres cannot be considered green or sustainable, if the Scottish Government decides to use the term, then it must produce a clear definition of a 'green data centre'. This should align with use of the term 'green data centre' in NPF4, which only appears in relation to the Digital Fibre (broadband) Network (National Development 12). The data centres that support fibre broadband are not hyperscale; they are much smaller, so they can actually be 'green' as they require much less energy to run. The existing, much smaller data centres can be powered by 100% renewable energy, and some are.

To be classed as 'green', data centres should be powered by 100% additional renewable energy (in addition to that which already supplies the grid), and should meet strict criteria set by the Scottish Government on water use, heat island impacts, plans for waste heat disposal from day one of operations, and material use (in line with circular economy strategy and targets).

This definition must be communicated to local authorities via statutory planning guidance.

For more information, please contact:

Amanda Grimm
Advocacy Lead, Stop Climate Chaos Scotland
amanda@stopclimatechaos.scot