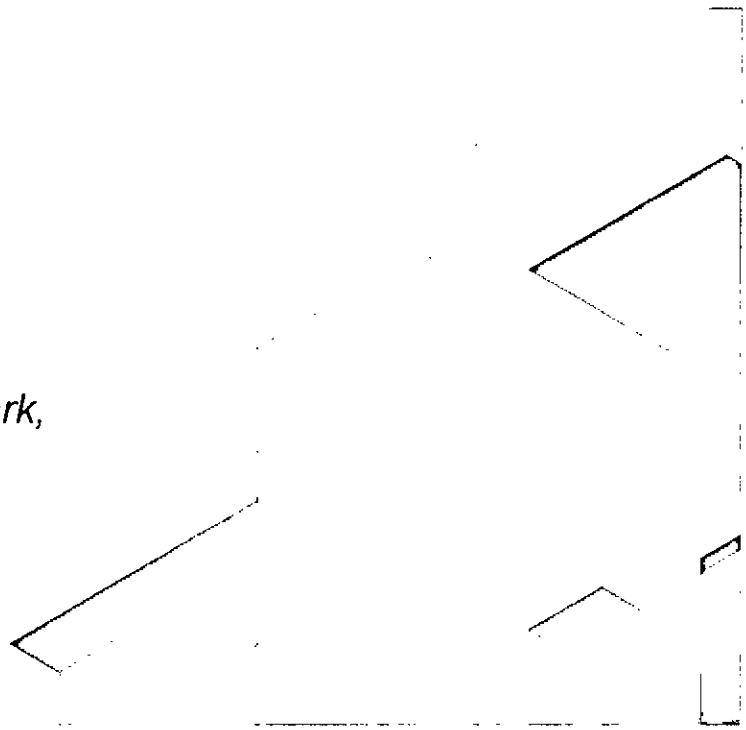
Energy Statement

Unit 1, M50 Business Park,
Ballymount, Dublin 12

December 2022



Document Information

Title and Number

Document Title	Document No.	Agile File No.
Energy Statement	NA	NA

Revision History

Revision	Author(s)	Reason for Changes	Date
R3	AF, NK	Planning Submission	14/12/2022

Related Documents

Document Title	Description	Location

Reviewers

Name	Signature	Title	Date
WC			

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1. Introduction

1.1. Purpose of Document

This Energy Statement has been prepared to accompany a planning application in respect of the change of use from warehouse to data repository facility at the existing facility located at Unit 1, M50 Business Park, Ballymount, Dublin 12.

The site totals 8,915 sqm in area and is currently vacant. The site is bound to the north-west by Calmount Road, to the north-east by an existing warehouse unit to the south-east by an internal estate road within the M50 Business Park and to the south-west by Ballymount Road Upper.

The proposed development will consist of:

- the change of use from warehouse to data repository facility,
- alterations to external facades, provision of a new 1,100 mm parapet, reclad roof, internal alterations, refurbishment of the existing office space, solar panels at roof level
- external plant at ground and roof level and equipment to include 12 no. condenser modules, an emergency back-up generator and associated fuel storage tank, transformer,
- extension to the existing sub-station (c. 13 m2),
- 2 no. sprinkler tanks and pumphouse, bin store,
- 22 parking spaces including 2 electrical vehicle charging points, bicycle parking shelter, landscaping, planting, new security fence, external lighting, CCTV, altered vehicular gates, permeable hard surfaces,
- alterations to internal foul sewerage and water supply networks, provision of SuDS compliant surface water drainage system and
- all associated site works.

The proposed development has been prepared in accordance with the relevant provisions of the South Dublin County Development Plan 2022 – 2028 In addition, the proposal is supported by national and regional policy including the National Planning Framework and the Regional Spatial and Economic Strategy for the EMRA. This Energy Statement together with all application documentation and drawings demonstrate how all relevant issues have been addressed.

1.2. Technical Guidance Document Part L (2017)

The development is considered a Major Renovation under the Building Regulations. It consists of unheated operational space in the tape media libraries and heated ancillary office space. With respect to The Building Regulations, Technical Guidance Document (TGD) Part L notes that parts of the building with installed heat capacity of less than 10W/m^2 are defined as having "low level of heating" and as such, are held to less demanding requirements. As such the data storage operational space is exempt from the requirements of TGD Part L 2017 with respect to heating, ventilation and air conditioning systems. Lighting associated with this area shall be considered and regulated by Part L.

The office space, is a fully air-conditioned space and will meet the requirements of the TGD Part L - 2021. Building Energy Rating BER - A3 or higher is targeted for the office development with the utilization of high efficiency variable refrigerant flow (VRF) Air Conditioning and roof mounted PV Panels to generate on site renewable electricity to be compliant with nZEB "Nearly Zero – Energy Buildings" requirements.

1.3. Building Operator

The proposed building will be operated by Amazon Data Services Ireland Limited (ADSIL), the Irish entity of Amazon Web Services (AWS) which is part of the Amazon.com, Inc group of companies. The development will provide infrastructure supporting reliable, scalable, and inexpensive data

storage services to their customers. The AWS Global Cloud Infrastructure is the most secure, extensive, and reliable cloud platform, offering over 200 fully featured services from data centres globally. With millions of active customers and tens of thousands of partners globally, AWS has the largest and most dynamic ecosystem. Customers across virtually every industry and of every size, including start-ups, enterprises, and public sector organizations, are running every imaginable use case on AWS.

The proposed facility will be used to house tape media which will store and be a repository for data. Customer data is stored on tape media within a temperature and humidity-controlled environment inside one of two tape libraries. This building is specifically for data archiving and cold storage of information and retrieval by customers is typically occasional. This form of data storage requires significantly less power consumption than a typical data centre.

Issues of energy efficiency and sustainability are outlined in the policy framework of the South Dublin County Development Plan 2022 – 2028. AWS is resolutely committed to sustainability. In 2019, Amazon co-founded The Climate Pledge, a commitment to reach net-zero carbon emissions by 2040—10 years ahead of the Paris Agreement. As part of this, Amazon is on a path to powering its global operations with 100% renewable energy by 2025 – five years ahead of its original target of 2030. Subject to a grant of permission this will include the power load for the proposed development which will be a maximum of 1.3 megawatt (MW).

Amazon is continuing to scale its renewable energy investments with a current total of 379 renewable energy projects around the world, marking significant progress on its path to powering 100% of its operations with renewable energy by 2025. Once fully operational, Amazon's current global renewable energy portfolio will generate 50,000 gigawatt hours (GWh) of clean energy, which is the equivalent amount of electricity needed to power 13.4 million European homes each year.

Amazon was the first company in Ireland to deliver unsubsidised Corporate Power Purchase Agreements (CPPAs). This means Amazon is helping to add renewable energy to the grid without direct government support, thus reducing subsidy costs on other local energy users. Amazon has committed to offtake 100% of the power from renewable wind projects in Cork, Donegal, and Galway. In total, these three wind projects are projected to add 229 megawatts of renewable energy to the Irish grid, producing enough renewable energy to power 185,000 Irish homes, per annum. These three wind projects will make Amazon the largest single corporate buyer of renewable energy in the country. Our first operational wind farm in Ireland is online in County Cork and is delivering clean energy to the country's electricity grid. The wind farm project is expected to deliver 68,000 megawatt hours (MWh) of clean energy annually – producing enough renewable energy to power 17,000 Irish homes per year.

Businesses in Europe can reduce energy use by nearly 80% when they run their applications on the AWS Cloud instead of operating their own data centres, according to a new report by 451 Research, a global research firm. The report, commissioned by AWS, also found that migrating compute workloads to AWS across Europe could decrease greenhouse gas emissions equal to the footprint of millions of households. In addition, businesses could potentially reduce carbon emissions of an average workload by up to 96% when AWS reaches its goal of purchasing 100% of its energy from renewable sources. The study also found that compared to the computing resources of the average European company, cloud servers are roughly three times more energy efficient, and AWS data centres are up to five times more energy efficient. In fact, moving a megawatt (MW) of a typical compute workload from a European organization's data centre to AWS Cloud could reduce carbon emissions by up to 1,079 metric tons of carbon dioxide per year.

The commitments noted above align with the goals of the South Dublin County Development Plan 2022 – 2028, in particular Policy E2 Objective 1 and Policy Objective E3 Objective 3.

2. Data Processing Areas Electrical Design Elements

2.1. Utility Supply

There is an existing connection agreement in place with ESB to supply power for the proposed development, which has a total peak power demand of 1.3 MW. Power will be supplied via 1 x Medium Voltage (MV) cable connection from the existing ESB substation (permitted and constructed under an existing permission) which is located immediately adjacent to the development site to the West. The proposed development includes the provision of a single-story client control switchgear room which will adjoin the existing ESB substation.

The site distribution system supplies all electrical rooms where stepdown transformers are deployed to provide 415V electricity to all loads. The distribution system described above is chosen as it represents the safest, most efficient and most economical method for site wide electricity distribution.

2.2. Transformers

To reduce electrical losses between MV/LV conversions, the applicant will install low loss transformers which comply with Commission regulation (EU) No 548/2014 implementing Directive 2009/125/EC with regard to power transformers.

2.3. Emergency Back-Up Generators

Standby power will be provided by a single containerized, diesel powered emergency back-up generator. This generator will provide emergency back-up power in unlikely event of a loss of power supply. Generators will only be in operation during a loss of power supply or for maintenance testing and therefore will be non-operational for the vast majority of time.

2.4. External Lighting

A site lighting report has been prepared to accompany the planning application. The external lighting will make use of high efficiency, low energy LED luminaires. The lighting design has been optimised to reduce glare, spillage or other light nuisance to adjacent sites and/or public roads.

Secondary external lighting in areas such as the generator compound will be operated via presence and daylight detection to minimize hours of operation and thus keep energy usage to a minimum.

2.5. Internal Lighting

Internal lighting shall be provided by high efficiency, low energy LED luminaires combined with presence detection controls or local switching where appropriate. The lighting design meets the illumination level requirements as outlined in the latest version (including addendums) of I.S. EN 12464 part1. IS 3217. The lighting design meets the illumination level requirements of CIBSE Code of Lighting.

LED luminaires are also to be used for the emergency lighting installation, which is designed to comply with the latest version (including addendums) of requirements of EN 1838 and IS 3217.

2.6. Relevance to South Dublin County Development Plan 2022 – 2028

The systems noted above are supportive of the South Dublin County Development Plan 2022 – 2028, in particular Policy E3 Objective 1 and Policy E3 objective 3, although, as stated in the Planning Report, the development consists of change of use of an existing building.

3. Data Processing Areas Mechanical Design Elements

3.1. Tape Storage Room Environmental Conditions

Due to the strict temperature and humidity conditions required for the tape storage libraries, the proposed facility will use recirculation air cooling via pumped refrigerant free cooling DX computer room air conditioning (CRAC) units and associated external ground-mounted condensers. This refrigerant based solution supplies cooled air to the tape storage libraries. Air then passes through the tape libraries, where it absorbs heat, and is recirculated to provide cooling. CRACs use condensers located externally on the ground to reject heat with refrigerant used as heat transfer media. DX CRAC cooling is tried and tested cooling method. The pumped refrigerant system allows compressor-less cooling for the majority of the year with compressor assistance occasionally required to cater for periods of higher temperatures.

- The air flow rate required to meet the environmental conditions is minimised, thereby reducing electrical power required for the fans.
- The requirement for compressor cooling demand is minimised by pumping refrigerant in its liquid state.
- No requirement for water use to maintain temperature.
- Water use to provide humidification only. It is expected that less than 4000 hours of humidification will be provided annually to this system. The annual water usage is estimated at less than 100m3 annually.

The mechanical system has various modes of operation to provide efficient and reliable cooling to the data processing area. The mechanical system is monitored and controlled by an electronic control system. The system monitors conditions and responds to reduce fan speeds and pump speed to maintain the operating point at the minimum necessary to meet the data storage room environmental conditions.

Significant power savings are achievable with this design. For example, a reduction in fan speed of 20%, reduces the power consumed by the fan by 50%, while a reduction in fan speed of 50%, reduces the power consumed by the fan by 87.5%.

3.2. Direct Drive EC Fans

All air supply and extract systems serving the data storage rooms are provided with high efficiency direct drive fans. The EC direct drive fan is the most efficient fan solution available to facilitate demand control. These fans are lighter in weight and require less power than a traditional centrifugal fan with variable speed drive (VSD). Typically savings of 10-20% in power consumption is achievable with an EC fan versus a centrifugal fan.

3.3. Relevance to South Dublin County Development Plan 2022 – 2028

The systems noted above are supportive of the South Dublin County Development Plan 2022 – 2028, in particular Policy E3 Objective 1 and Objective 3.

4. Offices & Ancillary Areas Mechanical & Electrical Design Elements

4.1. Mechanical Systems

The office air conditioning shall be served by a VRF refrigerant system. High efficiency units will be used to minimise electrical power demand. Typically, the energy efficiency of a VRF system will exceed that of traditional air-cooled chillers by 15-25%.

4.2. Ventilation Systems

The fresh air ventilation system for the office area will be served using energy efficient Heat Recovery Units which will recover waste heat from the office spaces and re-use to pre-heat the air with the HRU. This will reduce the overall energy consumption for this system. The toilet areas shall be mechanically ventilated.

4.3. Lighting

Internal lighting shall be provided by high efficiency, low energy LED luminaires combined with presence detection controls or local switching where appropriate. The lighting design meets the illumination level requirements as outlined in the latest version (including addendums) of I.S. EN 12464 part1. IS 3217. The lighting design meets the illumination level requirements of CIBSE Code of Lighting.

LED luminaires are also to be used for the emergency lighting installation, which is designed to comply with the latest version (including addendums) of requirements of EN 1838 and IS 3217.

4.4. PV Panels

Although it is not required for compliance with Nearly Zero Energy Building (nZEB) as outlined in Part L of the building regulations, a PV solar array of 22kWp (peak) will be installed at roof level to boost the energy efficiency of the building. The on-site renewable electricity generation will be serving lighting as appropriate, office area general services and office IT equipment.

Due to the proximity of the build to the nearby Dublin Airport, a Glint and Glare analysis has been carried out on the 22kWp array and it has been concluded that there will not be any hazardous glint and glare effects upon the Dublin Airport aviation receptors identified as a result of the proposed roof mounted solar PV panels.

4.5. Electric Vehicle (EV) Charging Infrastructure

It is proposed to provide 2 no. car parking spaces with electric vehicle (EV) charging facilities as part of the overall car parking provision.

4.6. Relevance to South Dublin County Development Plan 2022 – 2028

The systems noted above are supportive of the South Dublin County Development Plan 2022 – 2028, in particular Policy E7 Solar Energy, specifically Objective 1, which encourages and supports the development of solar energy infrastructure for on-site energy use.