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Hybrid Zoning Report

Zone Classification and Weighted PUE Analysis

FACILITY

Clonshaugh DC (Fictional Reference Facility)

DATE

April 2026

PREPARED BY

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CLIENT

Sample Client — For Demonstration Only

REFERENCE

LBE-HZ-CLN-001

CLASSIFICATION

Sample — Demonstration Only



Executive Summary

OVERALL ASSESSMENT VERDICT



AMBER — EU Taxonomy Alignment Achievable Through Partial Conversion

Hall A converts to AI-capable density with enhanced air cooling. Hall B retains conventional workloads with efficiency optimisation. MIC constraint requires an ESB Networks application before Hall A conversion proceeds — this is the binding precondition for the programme.

1.500

CURRENT PUE

▲ Above 1.3

1.243

TARGET PUE

✓ Taxonomy PASS

336.2

CURRENT CI KGCO₂/MWH_{IT}

▲ Above 300 band

278.5

TARGET CI KGCO₂/MWH_{IT}

✓ Below 300 band

ZONE CLASSIFICATION SUMMARY

ZONE	CLASSIFICATION	POWER	COOLING	STRUCTURE	ELECTRICAL	CONNECTIVITY	ECON. LIFE
Hall A	AI-Convertible (Enhanced Air)	AMB	AMB	AMB	GRN	AMB	AMB
Hall B	Conventional-Retain	RED	RED	AMB	AMB	AMB	RED

KEY FINDINGS

RED — MIC Constraint: 5.49 MVA at Target Exceeds 5 MVA MIC

Total facility load at target state exceeds current MIC by 0.49 MVA (9.9%). ESB Networks application required before Hall A conversion proceeds. Typical lead time: 6–12 months. This is the critical path item.

AMBER — Hall A Busway Upgrade Required for 15 kW/rack

Current 8 kW busway must be upgraded to support AI-capable load density. This is a prerequisite for conversion and must be in the engineering scope.

GREEN — Weighted PUE 1.243 Achieves EU Taxonomy Alignment Without Converting Both Halls

Hall B conventional retention at PUE 1.35 is sufficient when combined with Hall A at 1.20. Full conversion of both halls is not required.



Facility Profile

Client-supplied data. Used as inputs to all calculations.

Facility	Clonshaugh DC (Fictional)
Year Built	2013
Total Racks	400 (200 per hall)
IT Load	2.4 MW (6 kW/rack avg)
MIC	5 MVA
Grid	10 kV ESB Networks MV
Cooling	Raised-floor CRAH
Hall A cooling	2019 replacement, VSD
Hall B cooling	2013 original, no VSD
Redundancy	2N (A+B feeds)
Current PUE	1.50 ABOVE 1.3
Target PUE	1.243 wtd PASS

Zone Classification

Six-criteria RAG per hall. GREEN: no constraint. AMBER: manageable. RED: hard block.

CRITERION	HALL A	HALL B
3.1 Power Density	AMB	RED
3.2 Cooling	AMB	RED
3.3 Floor Loading	AMB	AMB
3.4 Electrical	GRN	AMB
3.5 Connectivity	AMB	AMB
3.6 Economic Life	AMB	RED
Classification	AI-Convertible	Conventional-Retain

Hall A — 2019 CRAH refresh creates in-row cooling path. Busway upgrade (8→15 kW/rack) and SM fibre installation required. Qualifies for AI-Convertible subject to MIC approval and busway scope.

Hall B — 2013 CRAH with 600 mm void has no retrofit path. MIC at 76% leaves no headroom. All original 2013 vintage with rising maintenance. Conventional retention with efficiency optimisation is the only viable strategy.



Weighted PUE Analysis

4.1 Current State

Hall A: 1.2 MW IT at PUE 1.45 = 1.74 MW facility energy. Hall B: 1.2 MW IT at PUE 1.55 = 1.86 MW facility energy. Total: 3.60 MW facility / 2.4 MW IT.

Weighted PUE = $3.60 / 2.4 = 1.500$. Above EU Taxonomy threshold.

4.2 Target State

Hall A: 3.0 MW IT at PUE 1.20. Hall B: 1.2 MW IT at PUE 1.35. Total IT: 4.2 MW.

Weighted PUE = $(3.0 \times 1.20 + 1.2 \times 1.35) / 4.2 = 5.22 / 4.2 = 1.243$. EU Taxonomy: PASS.

CRITICAL CONSTRAINT — MIC Exceedance: Target facility load 5.22 MW / PF 0.95 = 5.49 MVA. Exceeds 5 MVA MIC by 0.49 MVA (9.9%). ESB Networks MIC increase application required before Hall A conversion. Binding design target for Hall A: PUE ≤ 1.28 . Verified: $(1.3 \times 4.2 - 1.2 \times 1.35) / 3.0 = 1.28$.

SENSITIVITY ANALYSIS

Hall A PUE varied. Hall B PUE held at 1.35. Grid EF 0.2241 kgCO₂/kWh (SEAI 2026).

SCENARIO	HALL A PUE	WEIGHTED PUE	EU TAXONOMY	CI KGCO ₂ /MWH _{IT}
Base	1.20	1.243	PASS	278.5
+5%	1.26	1.286	PASS	288.1
+10%	1.32	1.329	FAIL	297.8
+20%	1.44	1.414	FAIL	317.1

CRREM PATHWAY POSITION

Mandatory Disclosure: Data centre pathway bands (200, 300, 400 kgCO₂/MWh_{IT}) are LBE-derived at T3/T4. The CRREM Foundation has not published an official data centre decarbonisation pathway as at April 2026. Results should not be attributed to the CRREM Foundation.

PARAMETER	CURRENT	TARGET	CHANGE
Weighted PUE	1.500	1.243	↓ 17.1%
Carbon Intensity	336.2 — above 300 band	278.5 — below 300 band	✓
Misalignment Year	Current — already misaligned	Approx. 2033 (conditional on grid decarbonisation)	



Indicative Cost Summary

AACE Class 5 (order of magnitude). Accuracy: -20% to +50%. Supply-and-install inclusive. Q1 2026 Dublin rates. Excludes design fees (8-12%), contractor preliminaries (12-18%), contingency (15-20%), VAT, tenant migration, ESB Networks MIC upgrade costs. Sources: SCSl M&E benchmarks, RICS NRM1, manufacturer data. T2/T3.

HALL A — AI-CONVERTIBLE

WORK PACKAGE	RANGE
Power distribution (busway, PDUs, UPS)	400K – 800K
Cooling (in-row units, CRAH integration)	500K – 1,100K
Containment and airflow	100K – 200K
Structured cabling (SM fibre, OM3)	120K – 200K
Protection study and commissioning	8K – 20K
BMS and PUE instrumentation	140K – 160K
Hall A Total (200 racks)	1.268M – 2.480M

HALL B — CONVENTIONAL-RETAIN

WORK PACKAGE	RANGE
Cold aisle containment and blanking	40K – 80K
Free cooling controls upgrade	80K – 140K
CRAH VSD retrofit	80K – 180K
PUE sub-metering and monitoring	60K – 120K
Hall B Total (200 racks)	260K – 520K
PROGRAMME TOTAL (BEFORE FEES, PRELIMS, CONTINGENCY)	LOW HIGH
All Zones	1,528,000 3,000,000

Sequencing Recommendation

<p>STEP 1 MIC Application CRITICAL PATH</p> <p>Apply to ESB Networks for 10 kV MIC increase. Lead time 6-12 months. No Hall A conversion until MIC approved. Start immediately.</p>	<p>STEP 2 Hall B Works PARALLEL WITH 1</p> <p>Cold aisle containment, free cooling controls, VSD retrofit, PUE monitoring. 3-4 months. Proceeds in parallel with MIC application.</p>	<p>STEP 3 Hall A Conversion AFTER MIC APPROVAL</p> <p>Busway upgrade, in-row cooling, PDUs, containment, SM fibre, protection study, commissioning. 6-9 months. Total programme: 12-18 months.</p>
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Methodology Disclosure and Professional Sign-Off

8.1 Scope

This report presents the results of a Hybrid Zoning Assessment conducted by LBE for the Clonshaugh DC reference facility using the LBE Hybrid Zoning Framework v1.0. LBE does not design, specify, or select equipment or contractors — this is the source of its independence. Because LBE has no interest in recommending a specific contractor or technology, this report is the only truly independent intelligence you can put in front of your investment committee. The framework is a proprietary LBE methodology. It does not constitute engineering design, detailed cost estimation, or a recommendation to appoint any specific contractor or product manufacturer. Design, specification, and delivery responsibilities remain with the client's appointed MEP firm.

8.2 Information Relied Upon

This assessment relies on facility data supplied by the client. LBE has not independently verified this data. Where data was unavailable, conservative assumptions have been applied and are noted in the relevant sections.

8.4 Professional Indemnity

All findings are indicative and screening-level only. Figures are estimated; they are not exact or 100% accurate. LBE carries PI insurance appropriate to its scope as an engineering intelligence consultancy. LBE does not carry PI insurance for engineering design or delivery.

CRREM disclosure: Data centre pathway bands (200, 300, 400 kgCO₂/MWh_{IT}) are LBE-derived at T3/T4. The CRREM Foundation has not published an official DC decarbonisation pathway as at April 2026. All references use the LBE-defined Misalignment Year metric.

8.3 Canonical Values

PARAMETER	VALUE	TIER
Grid EF	0.2241 kgCO ₂ /kWh (SEAI 2026)	T1
Carbon tax	71 euros/tCO ₂ → 100 by 2030	T1
Electricity	0.12 euros/kWh (CRU Q4 2024)	T2
Free cooling	7,200 hrs/yr <18°C (Met Éireann)	T1
EU Taxonomy PUE	≤ 1.3 (Delegated Act 2021/2139)	T1
CRU renewable	80% (CRU/2025236)	T1
Cost benchmarks	SCSI M&E, RICS NRM1, mfr data	T2/T3

Commission a report for your facility

To discuss your facility or commission a report, contact lmurphy@legacybe.ie or book a 30-minute call at screen.legacybe.ie



PROFESSIONAL SIGN-OFF

PREPARED AND SIGNED BY

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Founder, Legacy Business Engineers Ltd | CRO 720301

DATE

April 2026

STATUS

SAMPLE

SIGNATURE

Standards: EU Taxonomy Delegated Act 2021/2139; SEAI 2026; CRU/2025236; CRREM Foundation (LBE-derived DC pathway); AACE Class 5; RICS NRM1; SCS1 M&E Benchmarks 2025; LBE Hybrid Zoning Framework v1.0. Tool: DC-RPT-HZ-001 v1.0.0.

SAMPLE