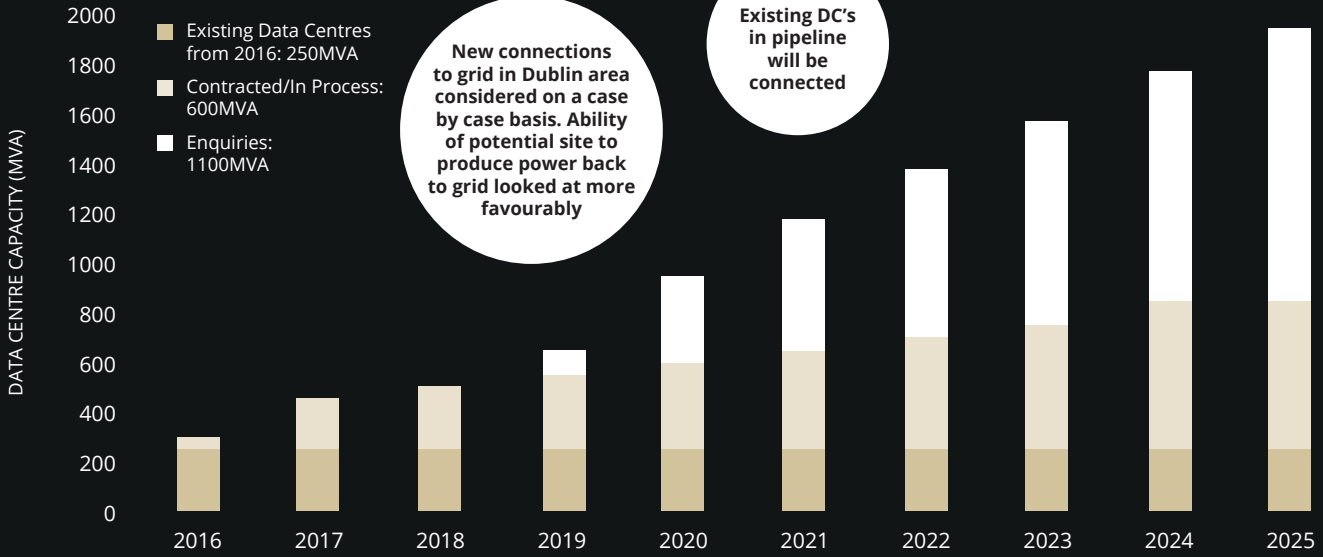
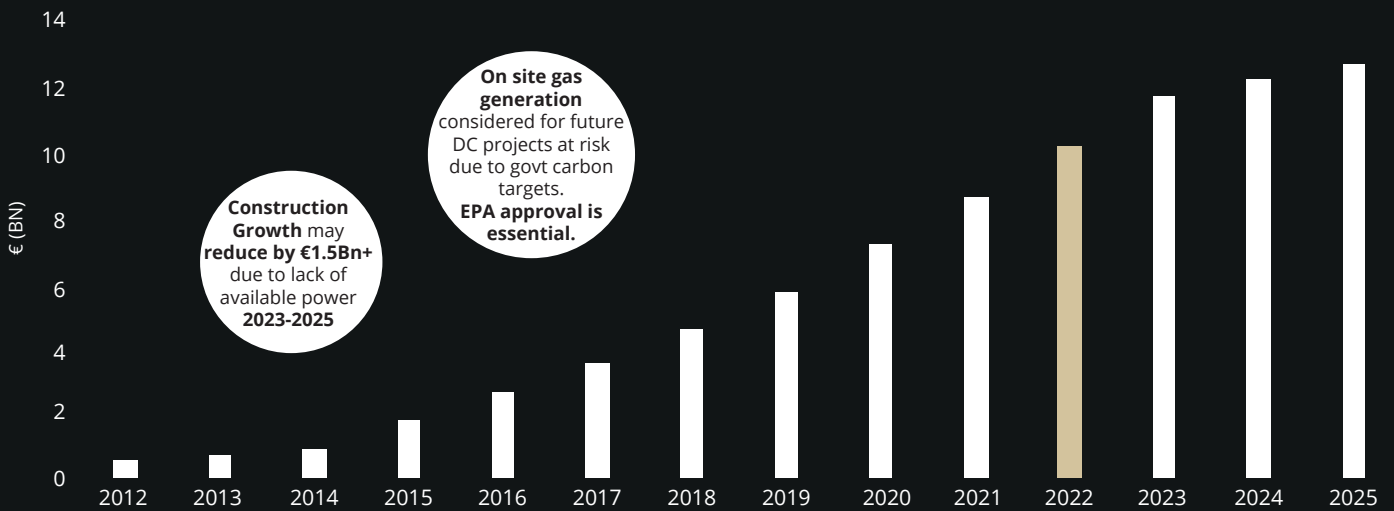


IRISH OVERVIEW

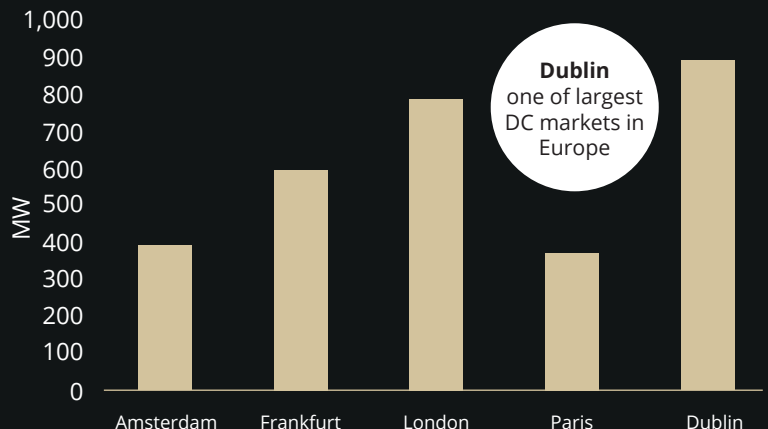
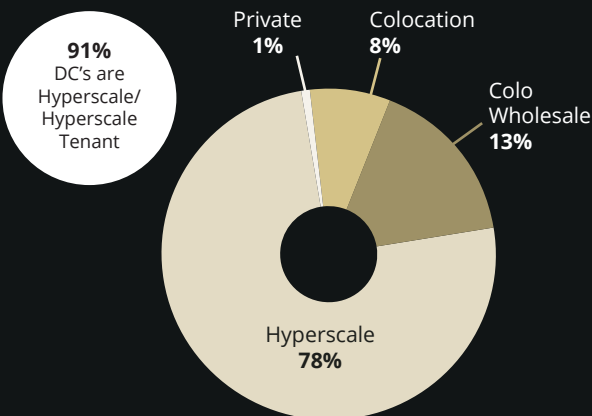


CONSTRUCTION INVESTMENT IN DATA CENTRES 2009 - 2025 (IRELAND)



DATA CENTRE TYPES IN IRELAND

MARKET SIZE (MW)

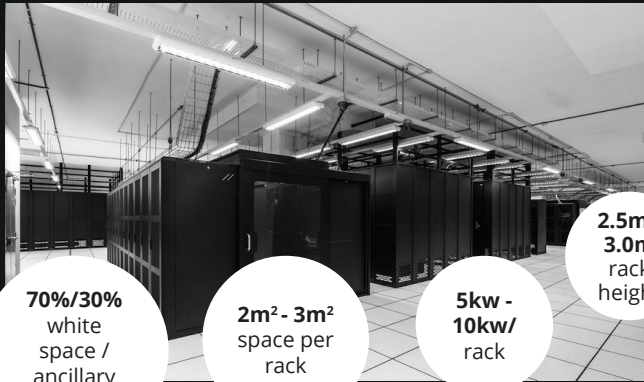


DATA HOSTING TYPES IN IRELAND

- Hyperscale** **Examples: Amazon, Apple, Facebook, Google, Microsoft.** Large scale companies that manage hosting for their clients. They build and operate their own data facilities to their own specification.
- Colocation Wholesale / Build to Suit** **Examples: K2, EdgeConnex, Echelon, CyrusOne, Stack.** Private investors fund, build and lease to the Hyperscales. The Hyperscale leases the "white space". This is relatively new to Ireland but is growing significantly due to demand.

- Colocation** **Examples: Digital Realty, Keppel, Equinix, InterXion.** Managed facilities for partial use by third parties. IT managers in various companies can lease "white space" which have high security, power and cooling.
- Private** **Examples: BT, Eir, OPW.** Purpose built by private companies involved in financial transaction, telecom and IT type industries.
- Edge** **Examples: Not yet in Ireland.** Edge DC's will range from 500kW to 2 MW. They will be located closer to where the end user is to help improve speed and latency.

DC DESIGN BENCHMARKS

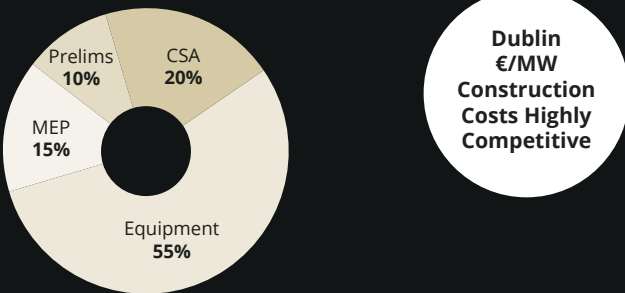


- 70%/30% white space / ancillary space
- 2m² - 3m² space per rack
- 5kw - 10kw/ rack
- 2.5m - 3.0m rack height

CONSTRUCTION COSTS	COST RANGE €0,000
Data Centre (white space spec) - €MW	
Data Centre	€10m - €13m
Substations	
Substation - 110kV	€18m - €23m
Substation -38kV	€5.5m - €6.5m
Infrastructure - Suburban	
HV Cable (1Nr) - aluminium (2km - 10km length)*	€185/m - €250/m
Trenching for HV Cable (2km - 10km length)	€550/m - €825/m

* Can also be copper pending trench depth. Rate fluctuates due to commodities market

Elemental Split €/MW

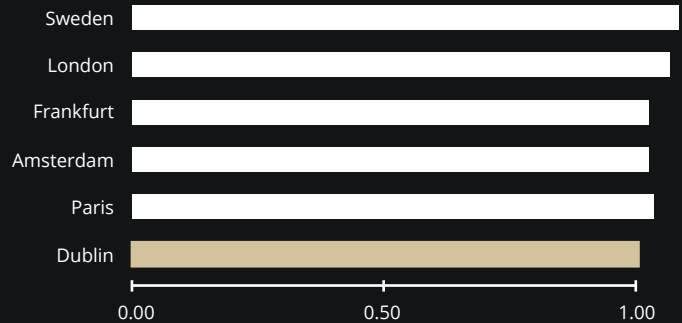


IRISH CONTRACTORS DELIVERING DATA CENTRES
BAM
Mercury*
John Paul
Bennett Construction
Collen Construction
Walls Construction
Sisk
Winthrop*
Designer
Jones Engineering*
MACE
Structuretone

Traditional M&E contractors have taken role as General Contractor on some projects in the Data Centre sector.

JARGON BUSTER	
Term	Explanation
PUE	Power Usage Effectiveness: measure of DC efficiency calculated by dividing the total data centre energy consumption by the energy consumption of the IT computing equipment.
LV MV HV EHV	Low Voltage - up to 1000V Medium Voltage - 1000V to 35kV High Voltage - 35kV to 230 kV Extra High Voltage - above 230 kV
MW	Mega Watt: a measure of power equal to one million watts. Often used to describe the size of data centres in terms of power capacity.
MVA	Used for the apparent power in an electrical circuit, equal to the product of root-mean-square (RMS) voltage and RMS current. It is a measure of power consumption.
N+1	Need plus one: a redundancy concept where capacity is configured to include used capacity plus one additional device to enable continued operations with the failure of one system in the configuration.
2N	A redundancy model that ensures that every component has a backup such that the data centre has no single point of failure.
Cold Aisle	An aisle where rack fronts face into the aisle. Chilled airflow is directed into this aisle so that it can then enter the fronts of the racks in a highly efficient manner.
Hot Aisle	An aisle where rack backs face into the aisle. Heated exhaust air from the equipment in the racks enters this aisle and is then directed to return vents.
HAC	Hot Aisle Containment: system that directs heated air from the outlet side of racks to air conditioning equipment return ducts in a highly efficient manner.

DATA CENTRE COST INDEX (Dublin base = 1.0)



USEFUL CONTACTS	
Company	Website
IDA	idaireland.com
Enterprise Ireland	enterprise-ireland.com
bitpower energy solutions	www.bitpower.ie
Host In Ireland	hostinireland.com
Eirgrid	eirgridgroup.com
Gas Networks Ireland	gasnetworks.ie
Planning & Construction Costs	mitchellmcdermott.com/insights

Tip: Hover over websites for links

The figures & data used for this card are based on a 10MW-20MW Data Centre with „white space“ only. Tenant servers and racks are excluded. Professional advice should be sought for specific projects. Costs are for construction only and exclude VAT | Tender Inflation from January 2023 | Site Acquisition | Planning and Statutory Fees | Development Contributions | Capital Contributions for Services connections | Bonds | Professional Fees | Sales and Letting Costs | Marketing | Legals | Valuers | Accountancy Costs | Finance Costs | Owner Insurances | Adjoining Neighbour Costs | Abnormal Ground Conditions | Brexit | Covid-19

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