IRELAND'S DATA HOSTING INDUSTRY

"An Industry of Substance"

Biannual Report - November 2020

Host In Ireland

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Foreword

Around the world, 2020 has challenged us in ways we never could have imagined. While many have struggled, bright spots have shone as our communities came together in compassion and care for one another. The data centre industry has been no different. As essential workers, the magnitude of responsibility to keep our country online and functioning has been great. Yet the data centre teams across Host in Ireland's partners have also felt a great sense of pride and purpose knowing the work they are doing is having a positive impact on their friends, neighbours and fellow citizens as a whole.

This isn't just a feel good sentiment, but also an economic one. According to recent research from ESRI, "despite the international and domestic economy shock, the economic impacts on Ireland's macroeconomy, as measured by the growth rate of gross domestic product (GDP), were relatively benign. . .the relatively strong performance of Irish exports during the first half of 2020 bucks the international trends when export growth around the world was falling." Leading those exports? Computer services for which data centres are the critical backbone infrastructure.

To break it down, €117 billion of the total €448 billion of Irish goods and services exports is due to computer services, accounting for just over one-quarter (26%) of Ireland's export activity. While exports fell dramatically for the vast majority of sectors (transport, tourism, retail to name a few), computer services, pharmaceuticals and medicinal products have had strong enough performances to buoy the Irish economy as a whole. This chart shows the breakdown of exports and a comparison of year over year growth.

	(1)	(4)	(5)
	2019 Share	Q2 Y-on-Y	Contribution to Growth (Y-on-Y)
Computer services	26	4	1
Goods for processing	15	14	2
Medicinal and pharmaceutical products (54)	11	30	3
Organic chemicals (51)	7	-16	-1
Business services other than research and development and operational leasing	5	-18	-1
Financial services	4	0	0
Business services: Operational leasing	4	-9	0
Merchanting (Net)	3	-2	0
Royalties/licences	2	-15	0
Insurance	2	5	0
Electrical machinery, appliances etc., n.e.s. (77)	2	21	0
Transport	2	-86	-2
Essential oils, perfume materials, toilet preparations etc. (55)	2	-12	0
Miscellaneous manufactured articles, n.e.s. (89)	2	-18	0
Professional, scientific and controlling apparatus (87)	2	-28	0
Tourism and travel	1	-90	-1
Office machines and automatic data processing equipment (75)	1	-7	0
Business services: Research and development	1	-7	0
Other transport equipment (79)	1	-76	-1
Chemical materials and products, n.e.s. (59)	1	-25	0
Overall	100	-1.7[11]	

Figure 1 - Breakdown of exports by product or service for top 20 largest items (sorted by 2019 share of total)*

* https://www.esri.ie/system/files/publications/RN2020301.pdf

Foreword

As Ireland continues moving towards a future of green electricity, sustainability offers another path forward for the digital economy. The government's latest budget prioritised decarbonisation of our society as one of the three key pillars to its plan, a smart and forward thinking proposition. Ireland has the potential to generate 9.2 GW of renewable electricity by 2030, far more than needed for Irish consumption. While talk of exporting the excess power is certainly worth consideration, there is an opportunity to power a more valuable export asset in the form of data.

The Irish Academy of Engineering's (IAE) recent report on "The Future of Electricity Transmission in Ireland" validates this thought by noting "One could indeed argue that there is little point in constructing large amounts of renewable generation in Ireland and then exporting its output at exceptionally low prices. Official CSO and SEAI import/export data for 2019 indicates that the price of Irish electricity exports, which take place predominantly when wind generation is high, is less than 50% of the price paid to wind generators for that output under the REFIT regime." As we see with other natural resources, the value add of a data service is greater than the renewable electricity alone. Add to that, the infrastructure to move data already exists whereas the infrastructure to move the electricity does not.

It continues to be an exciting time for the data centre industry. The work being carried out is having a real impact on our lives every day. While much in the future remains uncertain, I am optimistic that an abundance of opportunities still lay ahead for Ireland and its digital economy.

Garry Connolly
President & Founder - Host in Ireland

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Market Update

Since our last update (May 2020), we have seen the progress of a large number of data centre projects through planning and construction. The effect of COVID-19 on development has been minimal. Ireland continues to attract new investments, driven by Hyperscale cloud success, particularly Amazon (AWS), Microsoft (Azure), and Facebook. Third-party developers (wholesale) are highly active. The established clusters at Grange Castle, Ballycoolin, and Clonshaugh continue to grow.

Construction Activity

Microsoft moved closer to completion of their three new buildings in West Dublin, bringing to ten their total data centre buildings at the location. EdgeConneX commenced construction at an adjacent site. Also nearby, CyrusOne progressed construction of two of their four planned data centre buildings to an advanced stage. AWS began ground clearance at their newly approved development in West Dublin, while also progressing shell works at their Ballycoolin site. AWS sites at Tallaght and Clonshaugh reached completion, with further new construction at Clonshaugh commenced. Echelon data centers began ground works at their Clondalkin site. Facebook's Phase II development at Clonee including their second substation progressed.

There are currently eleven data centre buildings in construction in the Metro Dublin area, with an average size of 27 MW. New COVID-19 lockdown measures in Ireland in Q4 2020 allow for the continuation of construction activities.

Planning Developments

Since Q1 2020, AWS applied for and received planning permission for their development at Grange Castle (referred to above). EngineNode's plans for Clonee were approved. A site at Damastown received planning permission, and Equinix applied for an increased size development in Ballycoolin. A trend towards two- and three- storey data halls has emerged in 2020. There is currently a pipeline of 29 data centres with approved planning permission in Ireland. One more (consisting of three buildings) is in the planning process, and four data centres at one development are in appeal with An Bord Pleanala.

Construction Investment

We estimate construction spend will amount to €1.25 billion in 2020. We expect this to increase to €1.5 billion in 2021 and in 2022. In total the pipeline amounts to €6.7 billion in new construction in the five years from 2021 to 2025. This compares to a similar amount of investment in data centre construction over the previous ten years. The pace of investment will double.

Data Centre Capacity

Sixty-six data centres are now operational in Ireland. Thirty-one of these are directly operated by the Hyperscalers, who make up 80% of the capacity. Five are leased wholesale data centers, fifteen are colocation data centres, and the remaining fifteen are smaller "private" data centers operated by telcos and small providers.

The total design power capacity of all sixty-six datacentres is 834 MW. We estimate this is 630 MW of IT capacity running at 55% utilisation. Note also that completed data centres may take a number of years to reach full occupancy.

As always, we hope our dashboard and insights are useful. Stay safe.

David McAuley
Founder & CEO - BitPower

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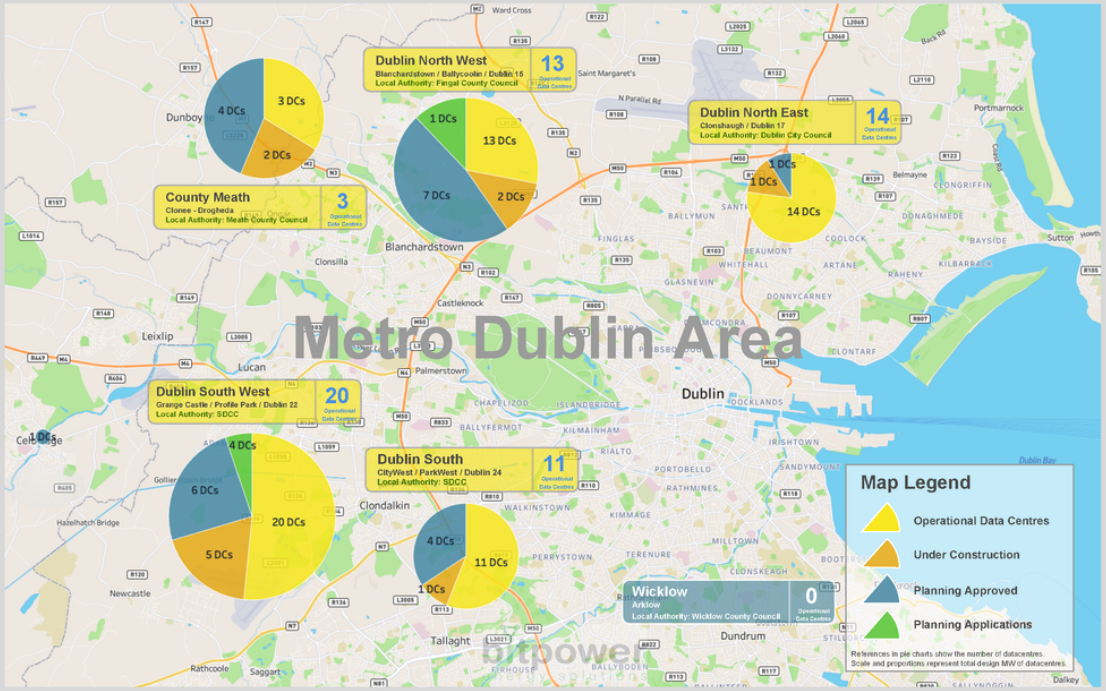
Planning Applications	Planning Approved	Under Construction	Operational Data Centres
5	29	11	66
88 MW	778 MW	295 MW	834 MW



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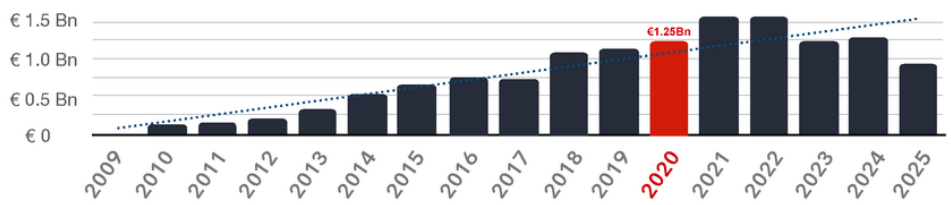
Business Impact

ICT in the Economy

€117 Bn	96%	€1.25 Bn
ICT Exports in 2019	Positive Sentiment in 2020	Construction spend in 2020
Source: CSO	96% of data centre ecosystem companies are optimistic about business outlook Source: Host in Ireland August 2020 Survey	

Construction Investment 2009 - 2025

Annual investments in data centres



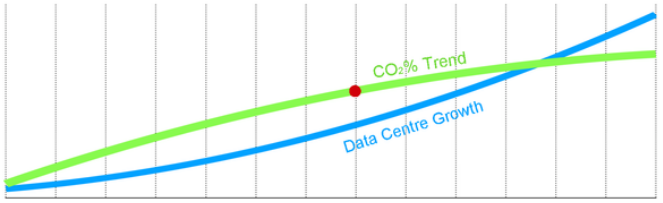
Source: Bitpower Research

Energy Related Carbon Emissions 2012 - 2025

Data centre capacity growth and projected carbon from 2012 to 2025

1.58%

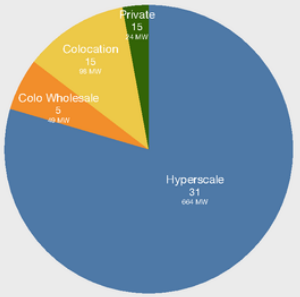
of Ireland's CO_2 in 2019



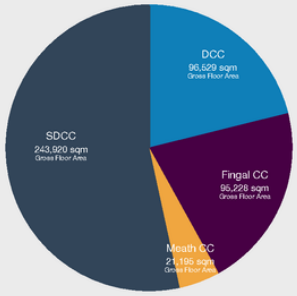
Source: Bitpower / Host in Ireland Q1 2020

Operational Scale Snapshot

Capacity and Footprint of Operational Data Centres



Data Centre Types
by Available Power Capacity (MW)



Local Authority
by Gross Floor Area (m^2)

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Host in Ireland is an award-winning strategic global initiative created to increase awareness of the benefits of hosting digital assets in Ireland as well as Irish companies that are designing, building, and operating data centres globally.

There are many benefits to hosting in Ireland: access to affordable power; redundant network and bandwidth capacity; along with a variety of data centre providers that offer an array of services sustained by the the “6 Ps”: Policy, People, Pedigree, Pipes, Power, and Proximity.

Ireland is not only the optimum location to host data, but as a global centre of excellence, it is also exporting data centre related products and services all over the globe.

Host In Ireland Partners

Although many of Host in Ireland’s partners are competitors, they have come together as a collective through Host in Ireland. This collective work together to promote the capabilities of Ireland as a centre of data excellence.

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