Ireland's Digital Success

Green Building Network

David McAuley

7th March 2018

IGBC
IRISH GREEN BUILDING COUNCIL

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Data Centres

Power Challenges

Digital Sustainability

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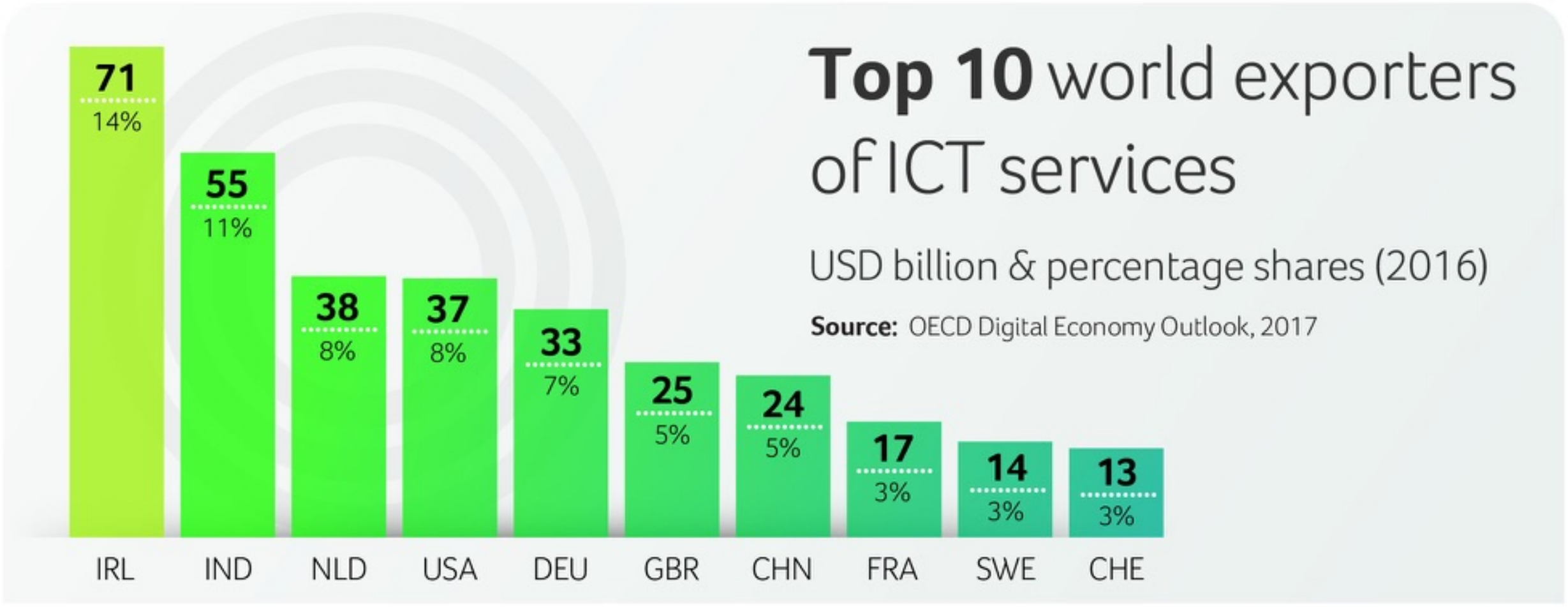

Ireland. Right place Right time

IDA Ireland

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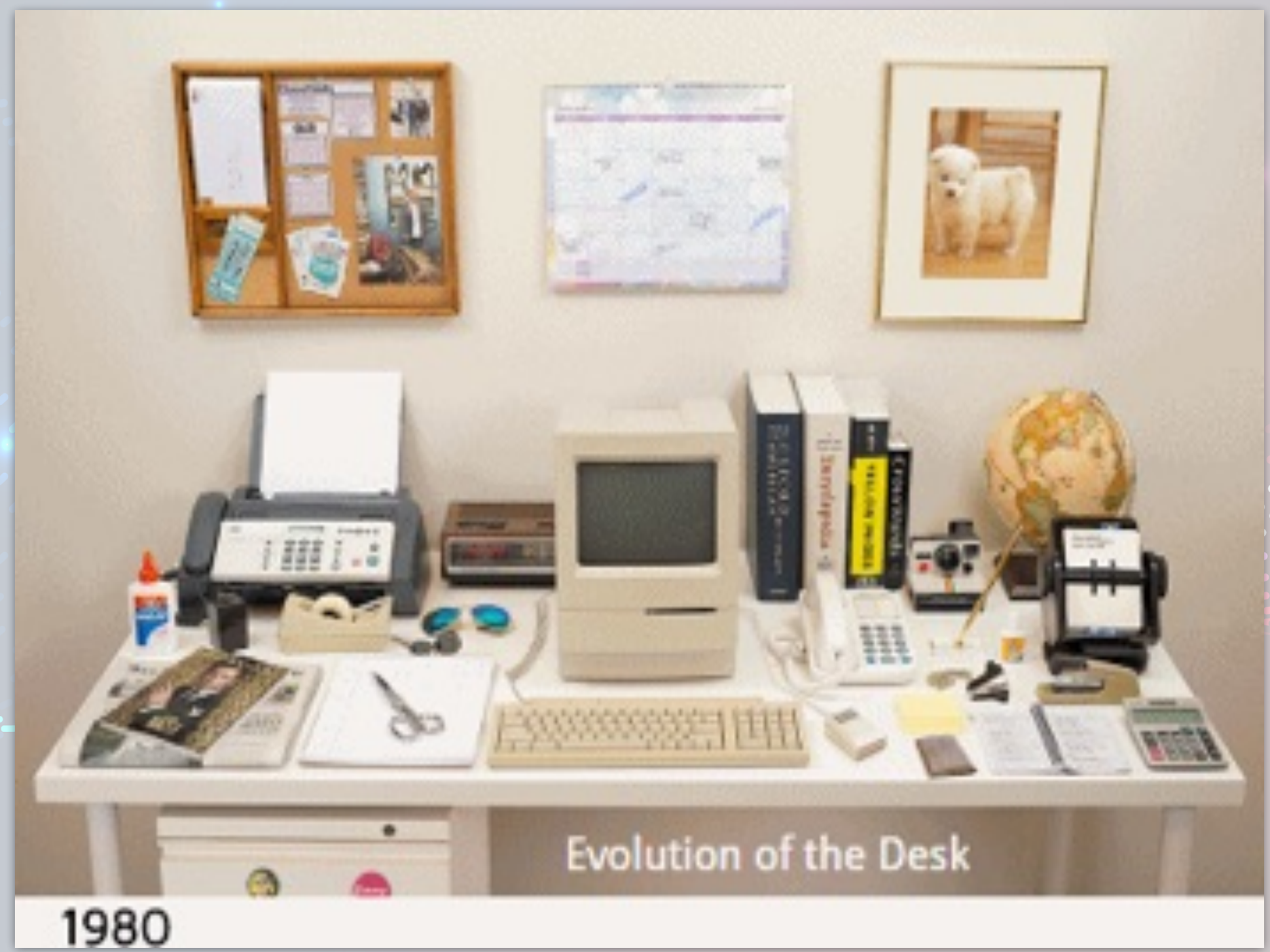
Digital Evolution



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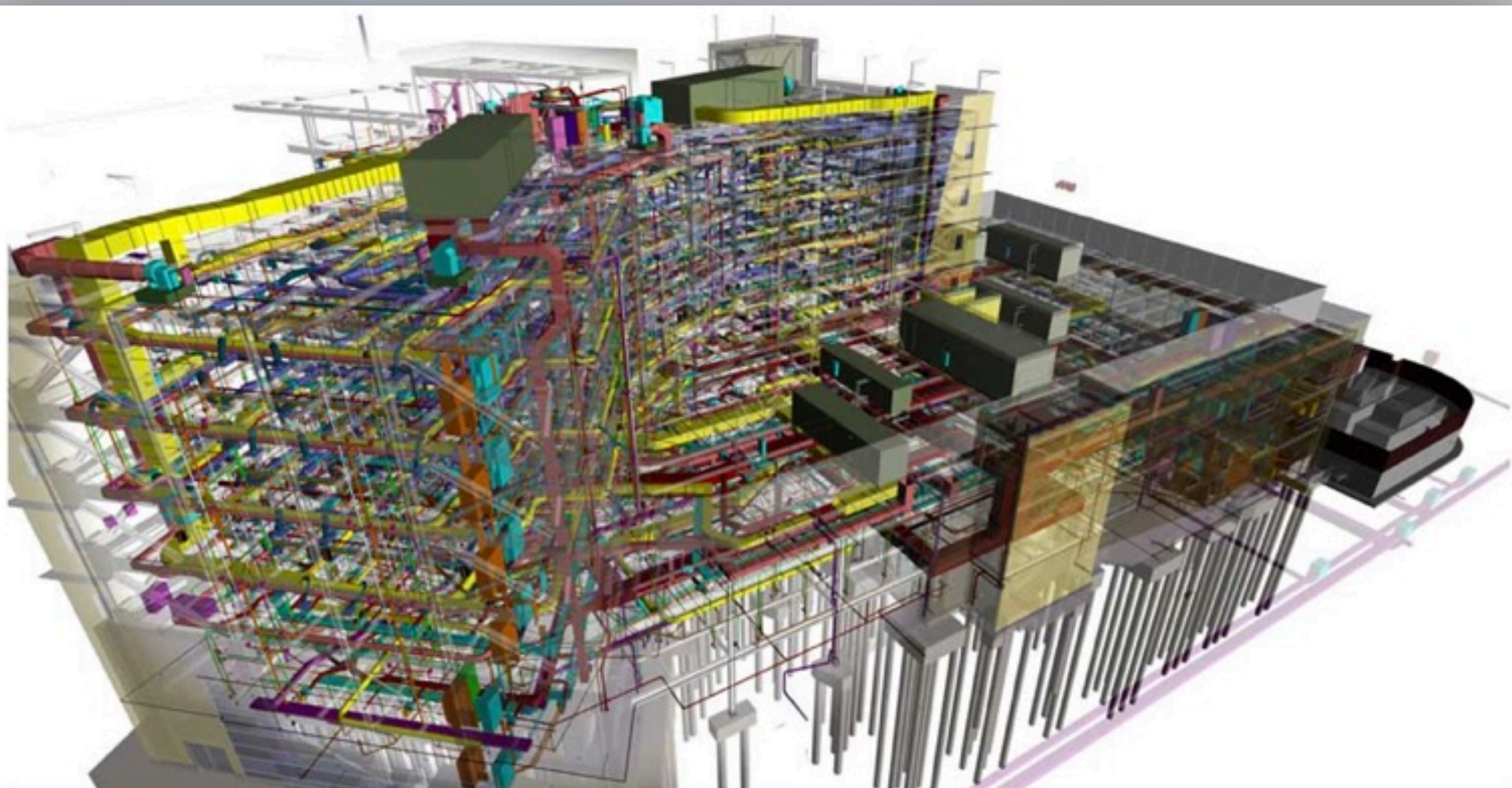
Building Information Modelling



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Augmented Reality

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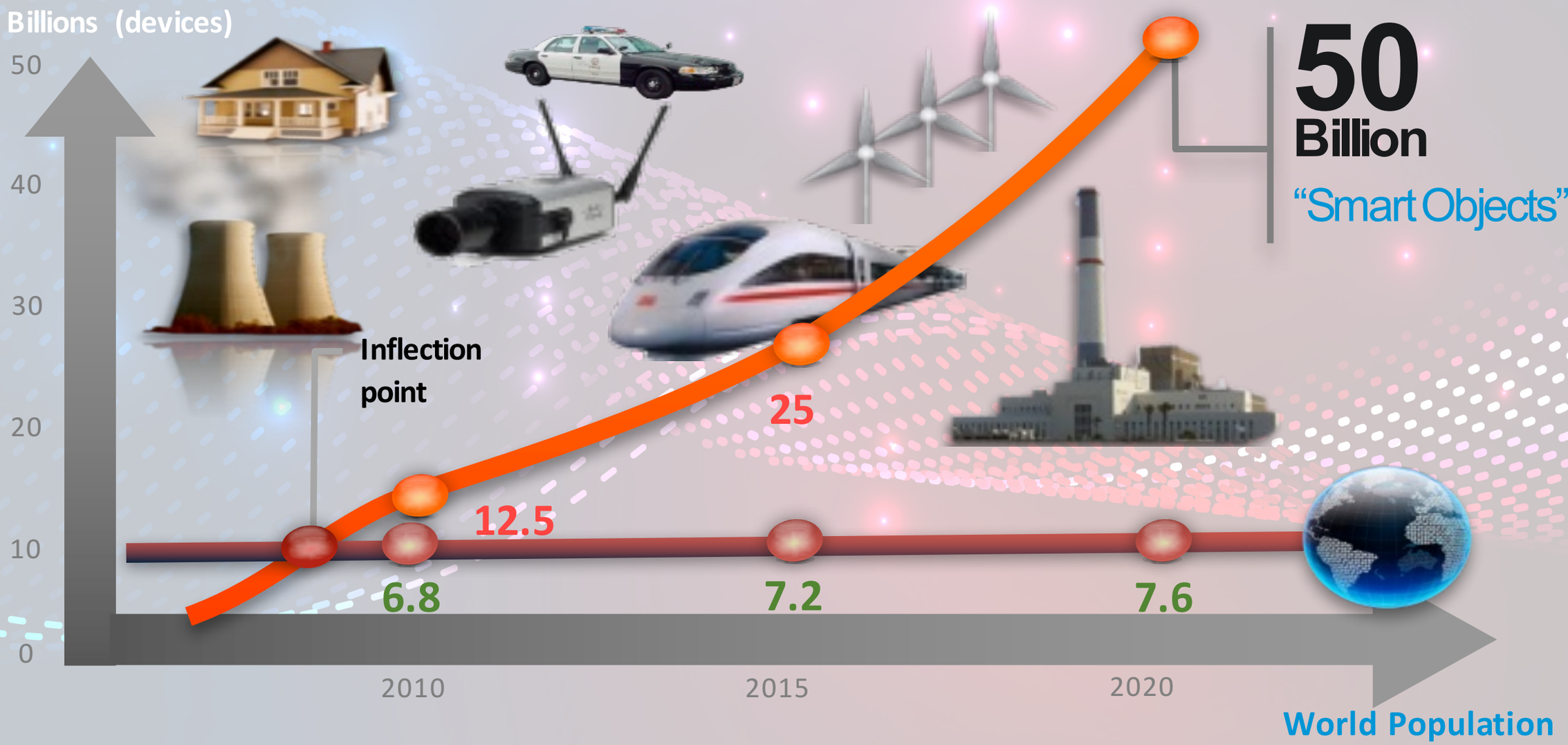
The Internet of Everything



Source: Cisco IBSG white paper "The Internet of Things", .

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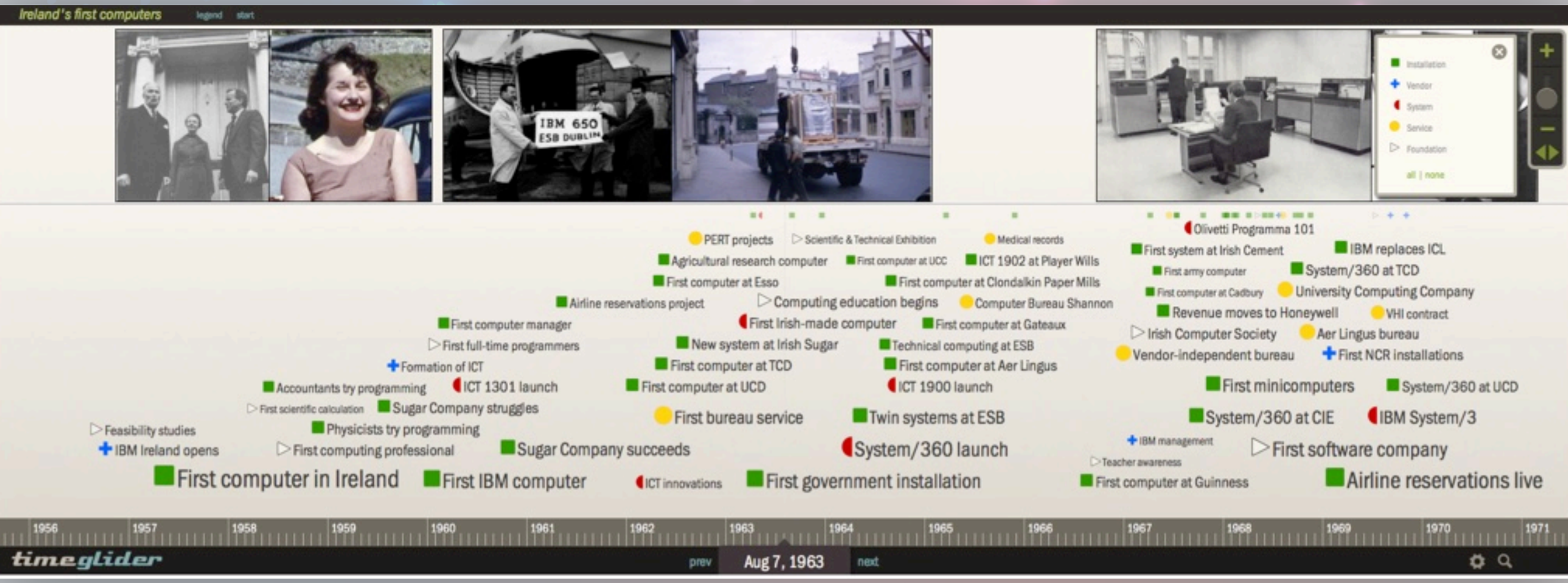
Ireland's IT since the1960's



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Hyperscale

Microsoft

amazon web services

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Colocation Facilities

EQUINIX

DIGITAL REALTY

interxion™

Keppel Data Centres

edgeconnex®

SUNGARD® AVAILABILITY SERVICES™

K2 DATA CENTRES

CLOUD CIX

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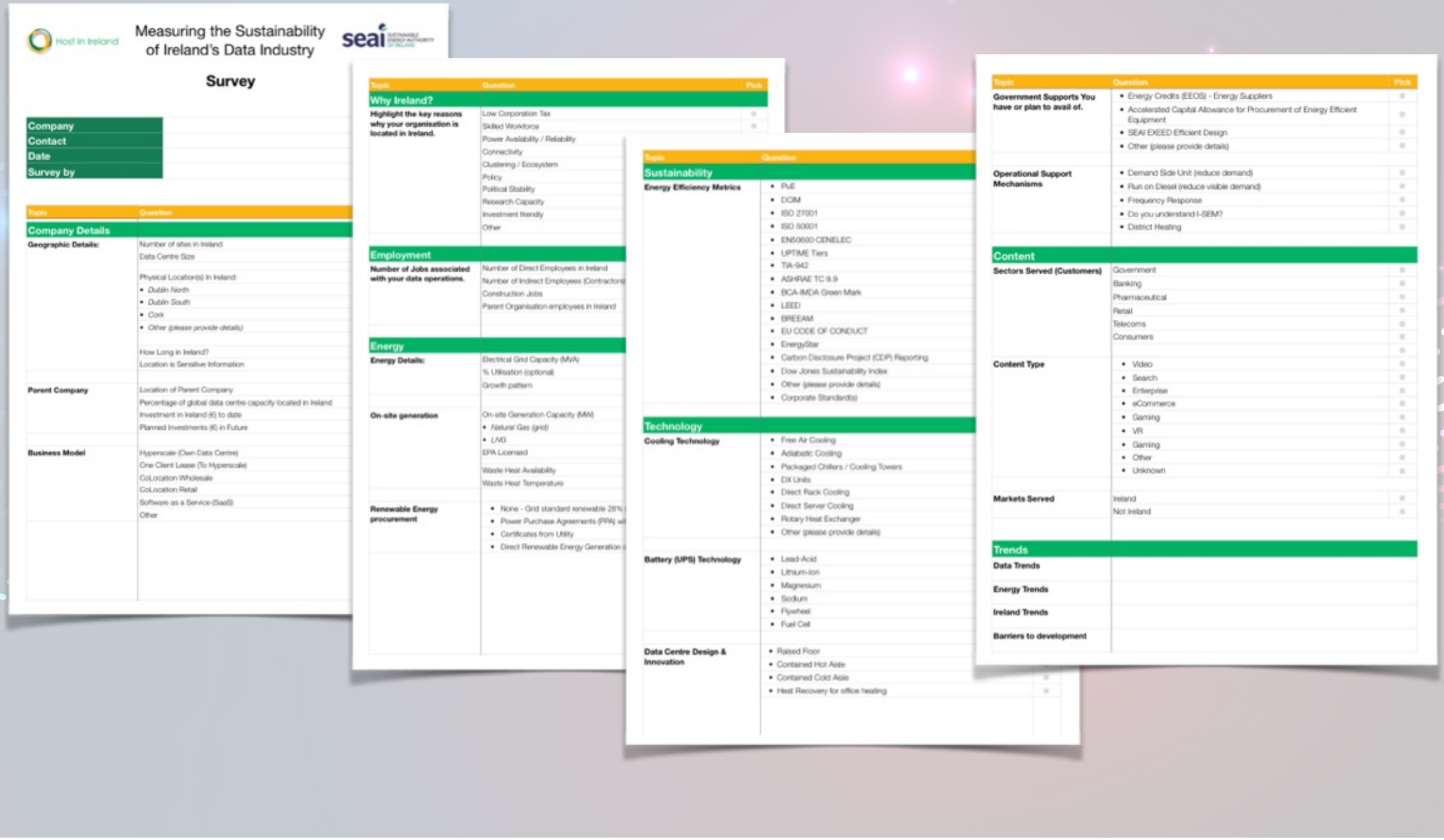
Sustainability Survey



Host In Ireland

Measuring the Sustainability of Ireland's Data Industry

seai

Survey

Company	
Contact	
Date	
Survey by	

Topic	Question
Company Details	
Geographic Details:	Number of sites in Ireland
	Data Centre Size
	Physical Location(s) in Ireland:
	• *Dublin North*
	• *Dublin South*
	• *Cork*
	• *Other (please provide details)*
	How Long in Ireland?
	Location is Sensitive Information
Parent Company	Location of Parent Company
	Percentage of global data centre capacity located in Ireland
	Investment in Ireland (€) to date
	Planned Investments (€) in Future
Business Model	Hyperscale (Own Data Centre)
	One Client Lease (To Hyperscale)
	CoLocation Wholesale
	CoLocation Retail
	Software as a Service (SaaS)
	Other

Topic	Question	Pick
Why Ireland?		
Highlight the key reasons why your organisation is located in Ireland.	Low Corporation Tax	
	Skilled Workforce	
	Power Availability / Reliability	
	Connectivity	
	Clustering / Ecosystem	
	Policy	
	Political Stability	
	Research Capacity	
	Investment friendly	
	Other	
Employment		
Number of Jobs associated with your data operations.	Number of Direct Employees in Ireland	
	Number of Indirect Employees (Contractors)	
	Construction Jobs	
	Parent Organisation employees in Ireland	
Energy		
Energy Details:	Electrical Grid Capacity (MVA)	
	% Utilisation (optional)	
	Growth pattern	
On-site generation	On-site Generation Capacity (MW)	
	• *Natural Gas (grid)*	
	• *LNG*	
	EPA Licensed	
	Waste Heat Availability	
	Waste Heat Temperature	
Renewable Energy procurement	• None - Grid standard renewable 28%	
	• Power Purchase Agreements (PPA) wi	
	• Certificates from Utility	
	• Direct Renewable Energy Generation	

Topic	Question
Sustainability	
Energy Efficiency Metrics	• PuE
	• DCIM
	• ISO 27001
	• ISO 50001
	• EN50600 CENELEC
	• UPTIME Tiers
	• TIA-942
	• ASHRAE TC 9.9
	• BCA-IMDA Green Mark
	• LEED
	• BREEAM
	• EU CODE OF CONDUCT
	• EnergyStar
	• Carbon Disclosure Project (CDP) Reporting
	• Dow Jones Sustainability Index
	• Other (please provide details)
	• Corporate Standard(s)
Technology	
Cooling Technology	• Free Air Cooling
	• Adiabatic Cooling
	• Packaged Chillers / Cooling Towers
	• DX Units
	• Direct Rack Cooling
	• Direct Server Cooling
	• Rotary Heat Exchanger
	• Other (please provide details)
Battery (UPS) Technology	• Lead-Acid
	• Lithium-Ion
	• Magnesium
	• Sodium
	• Flywheel
	• Fuel Cell
Data Centre Design & Innovation	• Raised Floor
	• Contained Hot Aisle
	• Contained Cold Aisle
	• Heat Recovery for office heating

Topic	Question	Pick
Government Supports You have or plan to avail of.	• Energy Credits (EECS) - Energy Suppliers	
	• Accelerated Capital Allowance for Procurement of Energy Efficient Equipment	
	• SEAI EXEED Efficient Design	
	• Other (please provide details)	
Operational Support Mechanisms	• Demand Side Unit (reduce demand)	
	• Run on Diesel (reduce visible demand)	
	• Frequency Response	
	• Do you understand I-SEM?	
	• District Heating	
Content		
Sectors Served (Customers)	Government	
	Banking	
	Pharmaceutical	
	Retail	
	Telecoms	
	Consumers	
Content Type	• Video	
	• Search	
	• Enterprise	
	• eCommerce	
	• Gaming	
	• VR	
	• Gaming	
	• Other	
	• Unknown	
Markets Served	Ireland	
	Not Ireland	
Trends		
Data Trends		
Energy Trends		
Ireland Trends		
Barriers to development		

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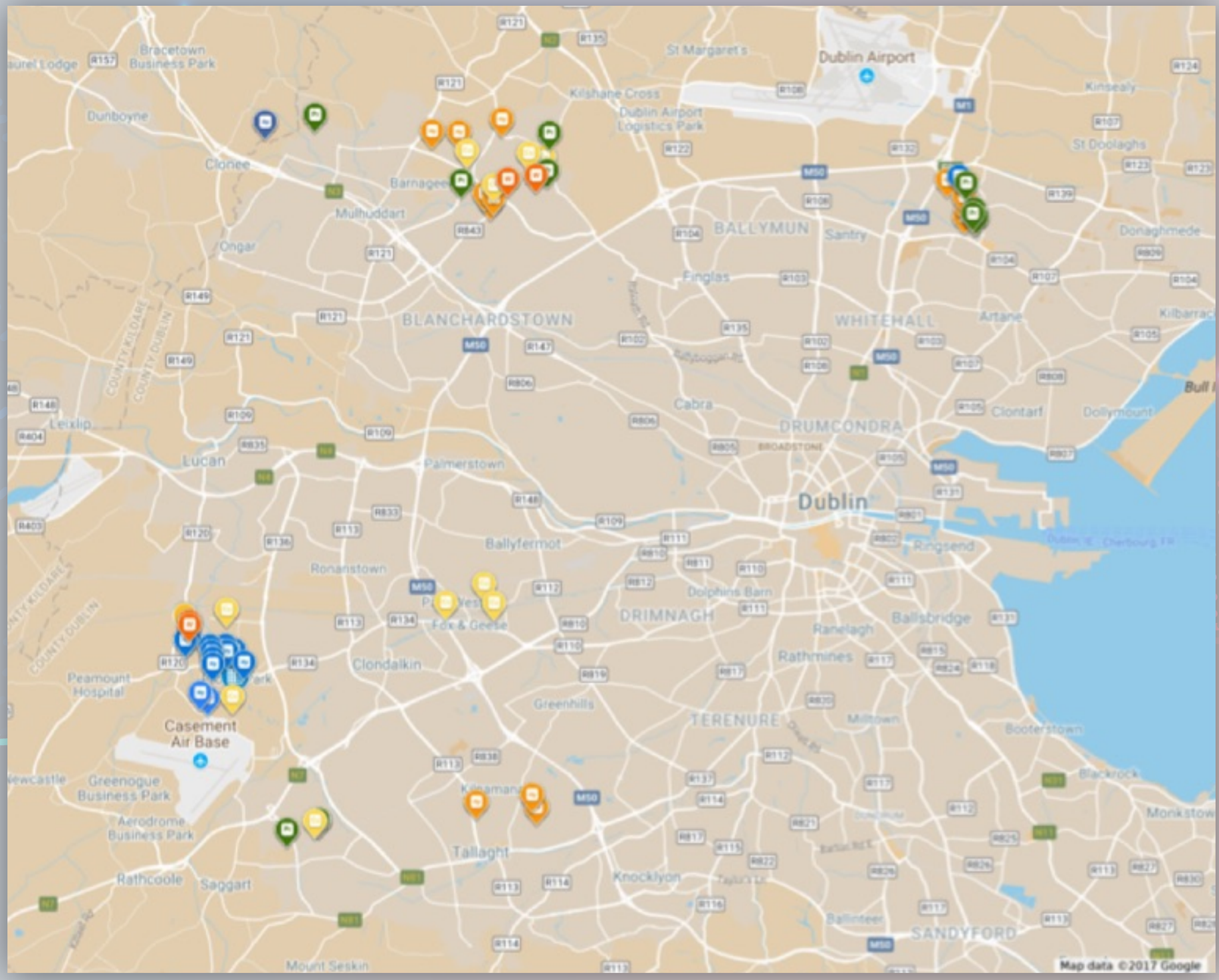
Dublin Cloud



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Dublin Area

Data Centres

This map shows all data centres covered by our study.

These include data centres which are:

- Operational
- In-construction
- With planning permission
- In the oplanning process
- In masterplans

The map shows the following types of data centre:

- Hyperscale
- Colocation
- Colocation Wholesale
- Private Data Centres

- No Edge data centres yet

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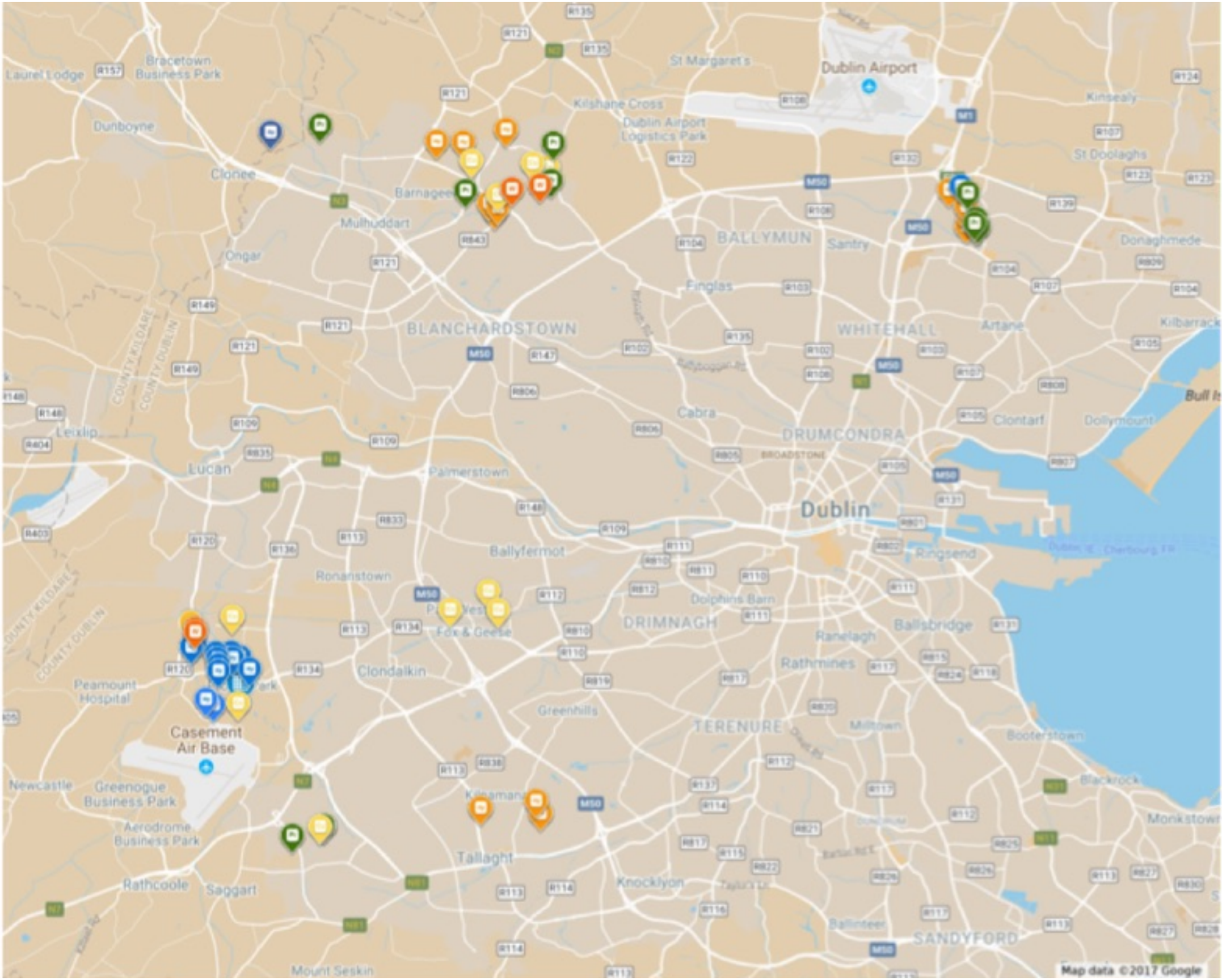
energy solutions



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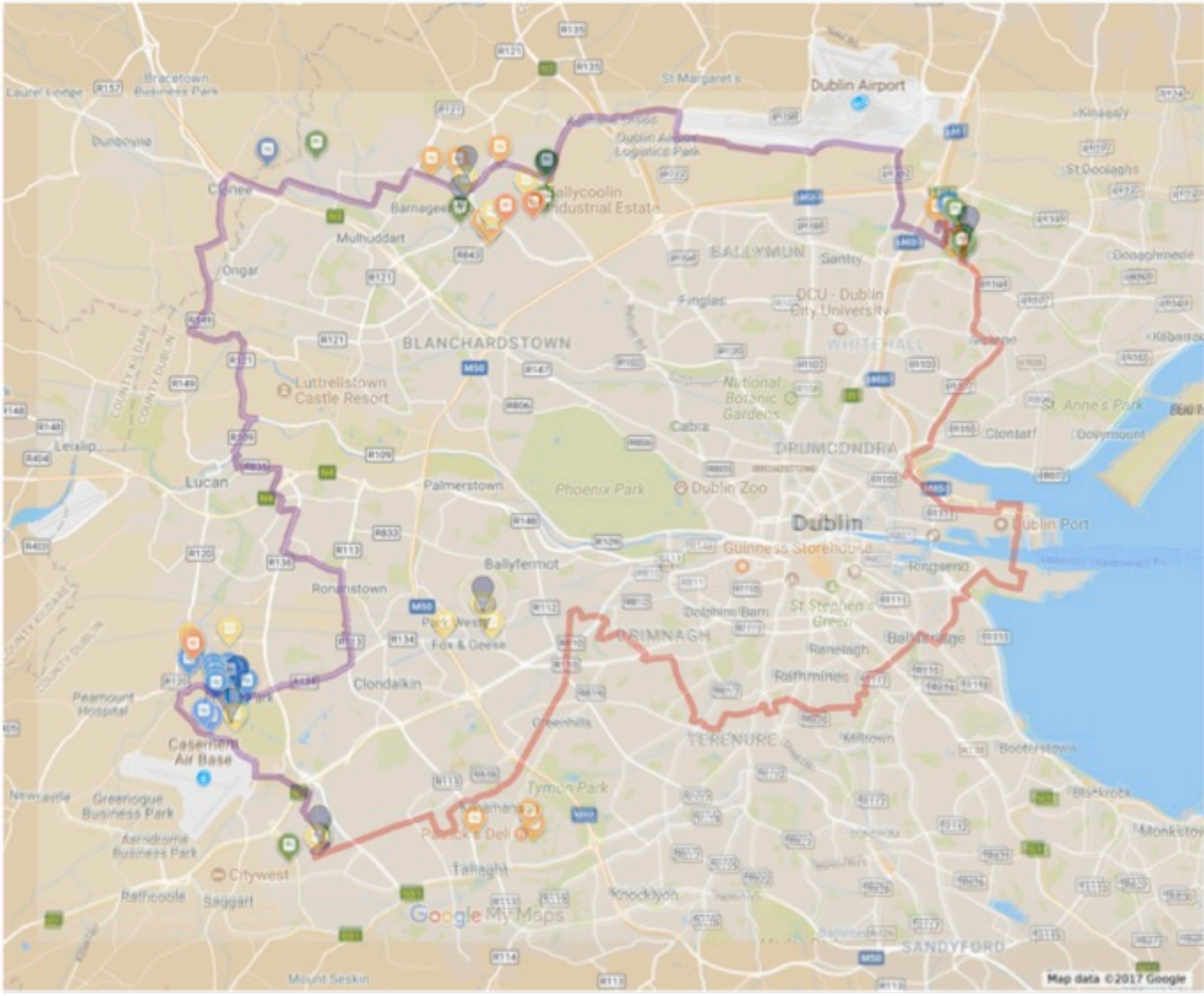

Hyperscale

Co-Location

Colocation Wholesale

Private Data centres

Edge Data centres

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Off-Island Fibre

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Regional Telecoms

vodafone

3

BT

Virgin media

Level(3) COMMUNICATIONS

gtt GLOBAL TELECOM & TECHNOLOGY

eunetworks

colt smarter / faster / further

imagine

Viatel

MAGNET

ESB Telecoms

ripplecom connecting business

AirSpeed TELECOM

plannet21 communications

fastcom

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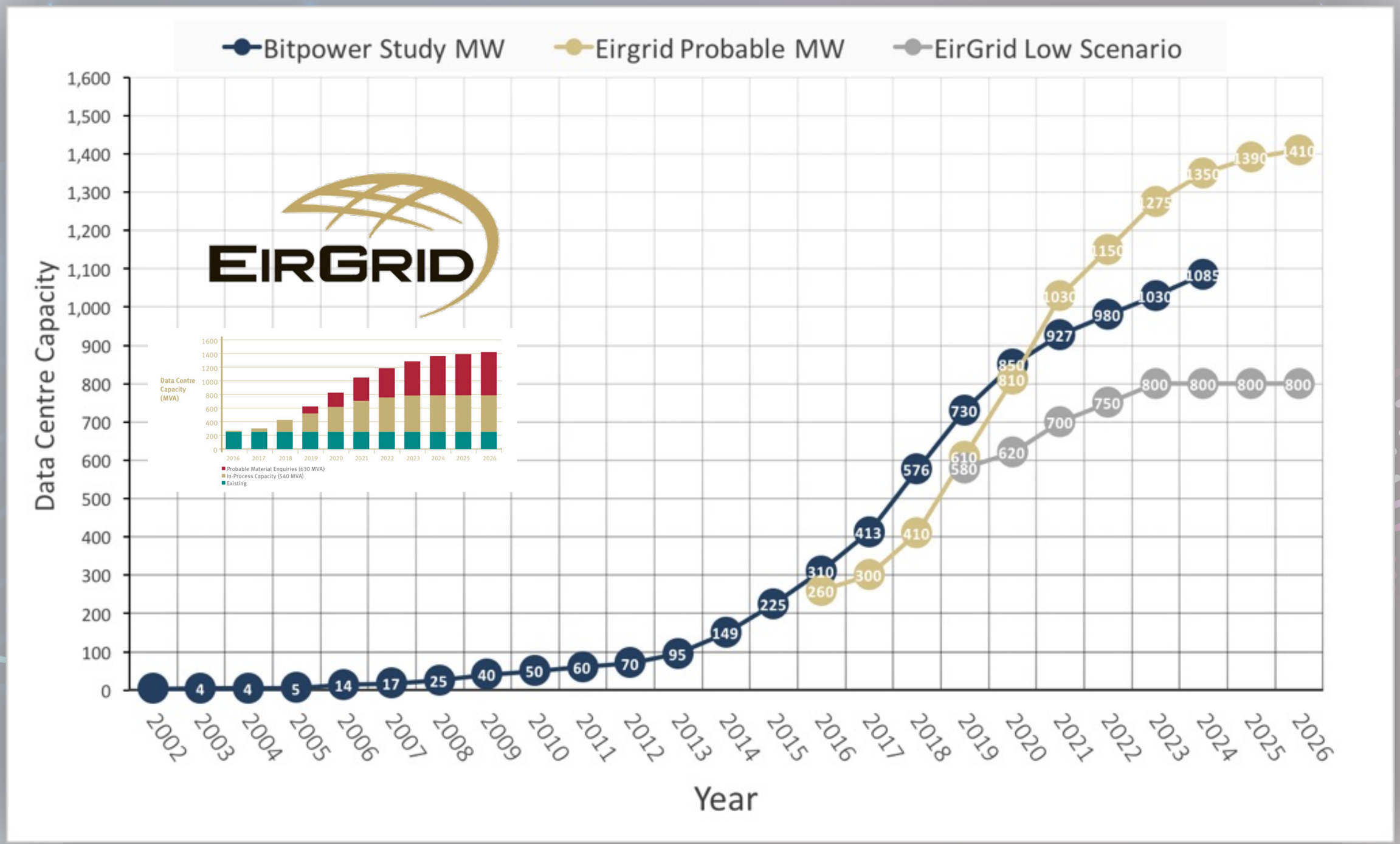
Grid Pressure



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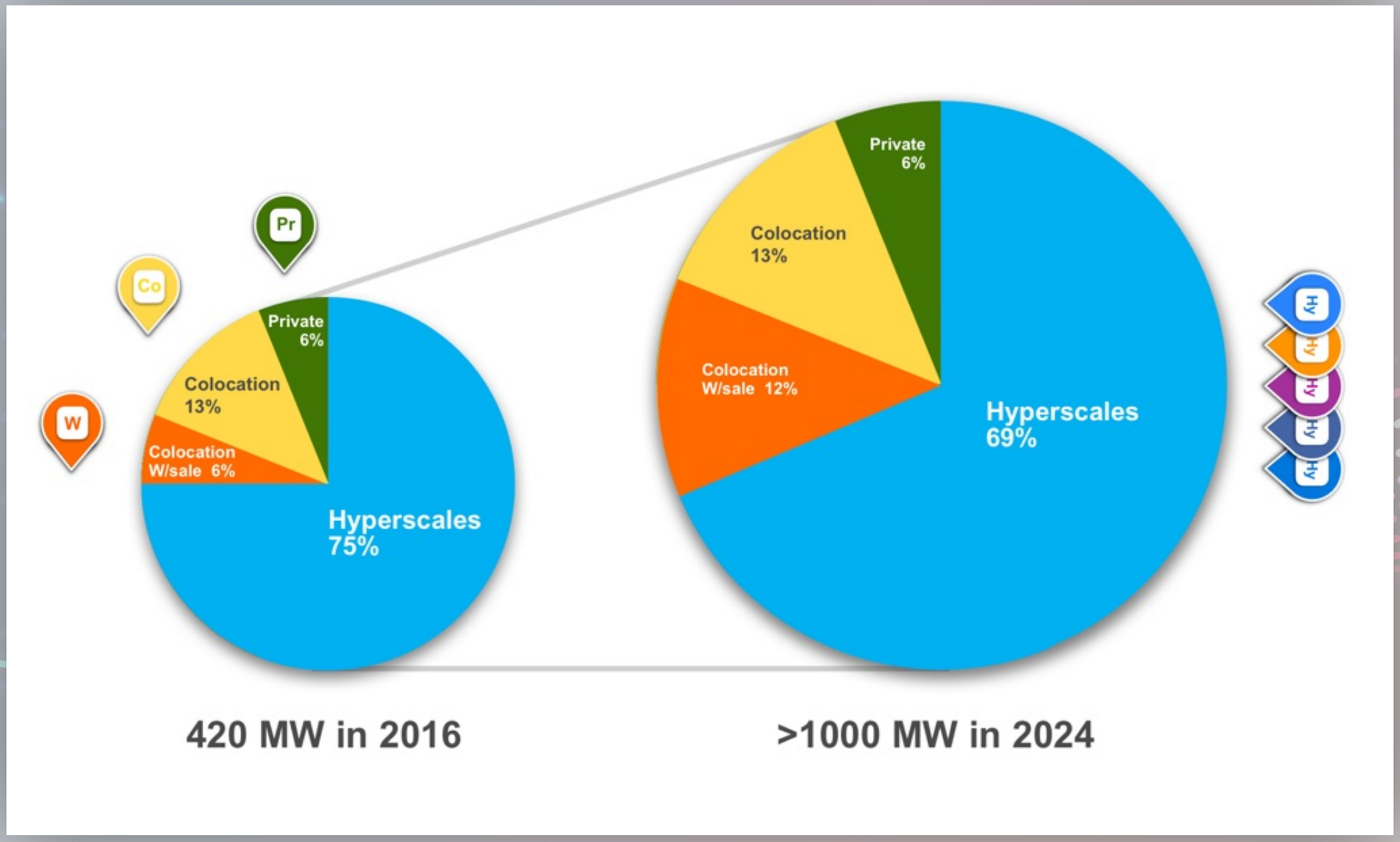
Growth Projection



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Dublin Area

Data Hosting Clusters

This map shows the clustering of data hosting facilities in the Dublin area as of mid 2017.

Red circles demonstrate the relative MW size of operational facilities in those locations.

Also shown (blue circles) is the projected growth of these clusters (not geographic spread). Some of this growth is already underway, with 10 new data halls under construction.

Circle size represents the relative scales in MW

Hyperscale

Co-Location

Colocation Wholesale

Private Data centres

Edge Data centres

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Natural Gas Alternative

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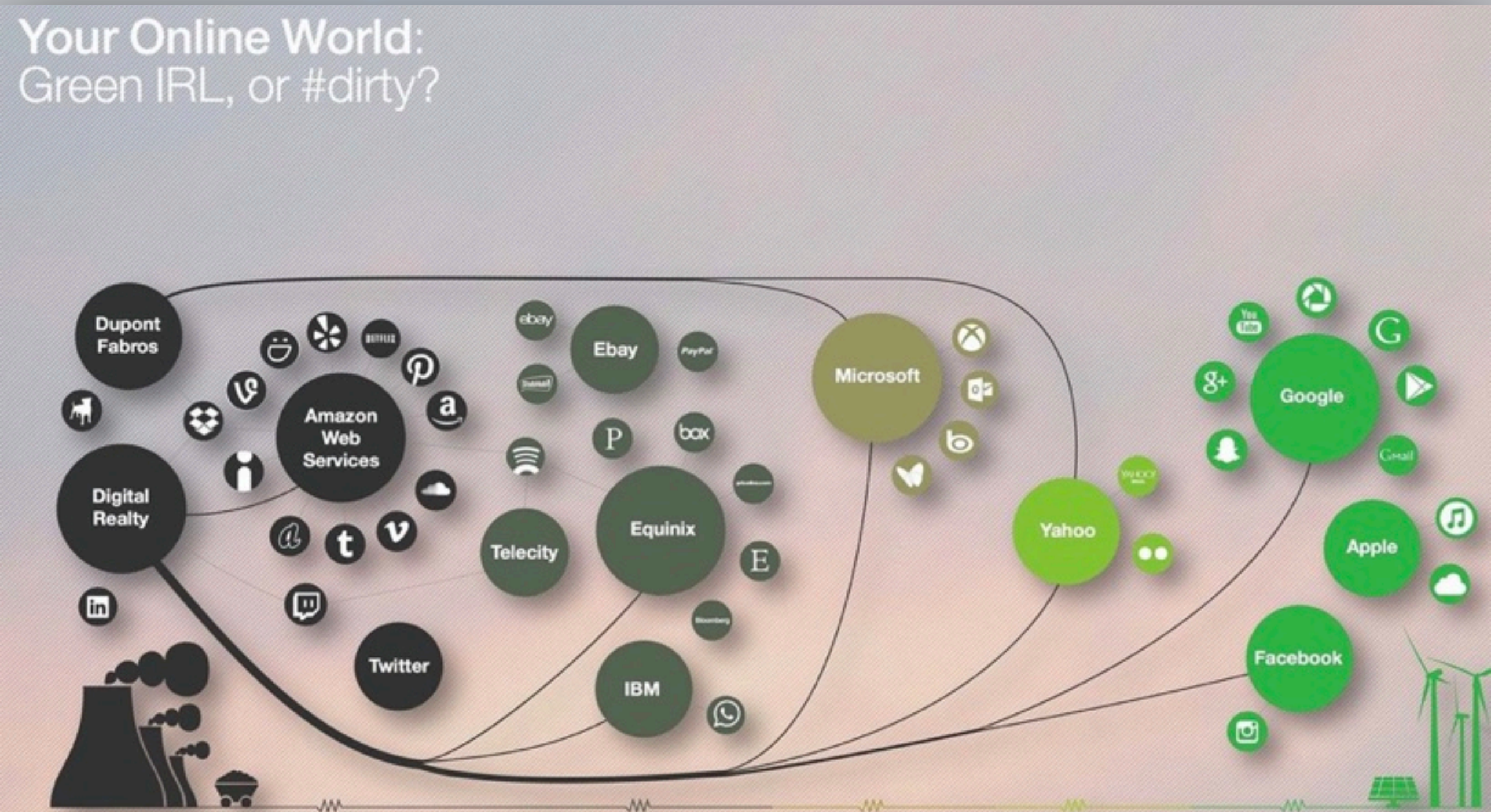
Sustainability Measures



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Sustainability Measures

	RE100	the green grid	Code of Conduct	SEAI LIEN	SEAI Agreement	CDP	Dow Jones Sustainability Indexes	Nasdaq	SGX	FTSE4Good	Greenpeace
Amazon									✓	✓	
Apple	✓			✓					✓	✓	
Facebook	✓		✓						✓	✓	
Google	✓	✓		✓	✓				✓	✓	
Microsoft	✓	✓	✓	✓			✓		✓	✓	
Digital Realty		✓					✓			✓	
Equinix	✓	✓	✓			✓		✓		✓	
Interxion		✓	✓	✓							
Keppel DC				✓	✓			✓			

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Sustainability Measures

	RE100	The Green Grid	Code of Conduct	SEAI LIEN	SEAI Agreement	CDP	Dow Jones Sustainability Indexes
IBM			✓	✓			
eBay	✓			✓		✓	
Intel		✓	✓	✓	✓	✓	✓
Siemens		✓					✓
Schneider		✓					✓
BT Group	✓		✓	✓		✓	✓
Colt Tech.						✓	
Commscope						✓	
Dell EMC				✓		✓	
Verizon						✓	
VMWare	✓					✓	
Vodafone				✓		✓	
Adobe Sys.	✓						✓
Cisco Sys.							✓
HP	✓			✓			✓
Rackspace	✓						✓
Xerox				✓	✓		✓

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Standards

- ISO 27001
- EN50600 - CENELEC
- Uptime Institute
- TIA-942
- ASHRAE TC 9.9
- LEED
- PuE / DCiE
- ISO/IEC JCT1 SC39
- EU Code of Conduct
- ISO 50001
- EnergyStar
- Whatever the customer wants

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Data Centre Capacity
Operatonal in 2017

420 MW

Construction Activity
10 New Data Centres

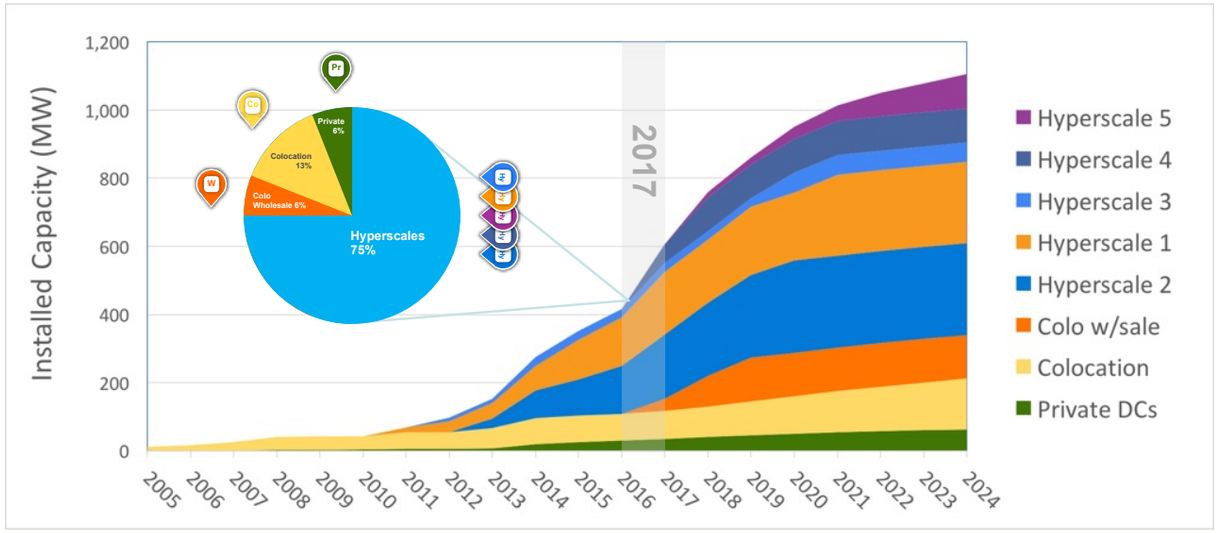
150 MW

Planning Approved
Shovel-ready projects

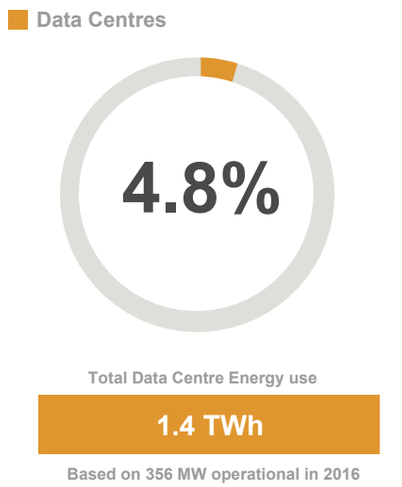
180 MW

Digital Hosting

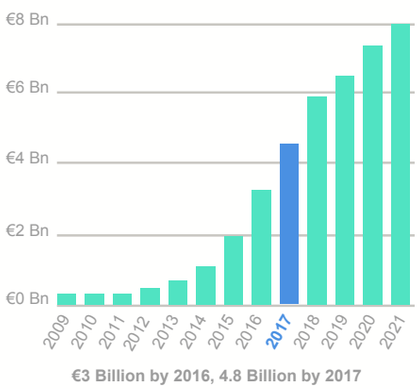
Growth Trend
Ireland's Data Industry



Electricity Demand 2016
% of Total Electricity Demand in 2016



Construction Investment
Cumulative 35% annual growth



€3 Billion by 2016, 4.8 Billion by 2017

Sustainability Metrics
Industry participation in CSR reporting

RE 100
FTSE4Good
SGX
LARGE INDUSTRY ENERGY NETWORK
Dow Jones Sustainability Indexes
Nasdaq
CDP
DISCLOSURE INSIGHT ACTION
CODE OF CONDUCT DATA CENTRES

Comparator
against energy procurement in Ireland 2016

Data centre energy use compared to:

Ireland's total Wind Generation
22% — 6.5 TWh

Guarantees of Origin
17% — 8.3 TWh

Ireland's total Electricity Demand
4.8% — 27.6 TWh

Ireland's CO_2 (assuming no renewables)
1.0% — 63 M TCO_2

Measuring the Sustainability of Ireland's Data Hosting Industry
2017 Study by Host in Ireland and Bitpower part-funded by SEAI under the Research, Development, and Demonstration Fund 2017

Host In Ireland
bitpower energy solutions

http://bitpower.ie/index.php/dashboard

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