



**Barcelona
Synchrotron
Park**

Barcelona DC Cluster

**WHERE TO INVEST
IN DATA CENTERS**
in Southern Europe

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BARCELONA



Barcelona DC Cluster



Parc de l'Alba is a 408-hectare public park made of 3 areas with **3 main missions**:

- **Creating** a new residential neighbourhood (5,377 apartments)
- **Preserving** biodiversity in the green zones (41% of the *Parc de l'Alba's* surface)
- **Attracting** innovative companies around the iconic **ALBA synchrotron** in the area called **Barcelona Synchrotron Park**



1,392,716 m² of floor area

67,200 m² for Data Centers

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**ALBA means Dawn*

SOUTHERN SPAIN

E15 AP-7

UAB UNIVERSITY

#2 Spanish University

#157 Worldwide

(THE 2019-2020 Ranking)

UAB RESEARCH PARK

LONDON, PARIS



PARC DE L'ALBA

INTERMODAL STATION

CERDANYOLA TOWN

BIOLOGIC CORRIDOR



Business @ Biodiversity

COMPANIES AREA

Barcelona Synchrotron Park



NEW RESIDENTIAL NEIGHBOURHOOD

SANT CUGAT TOWN

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PTV TECHNOLOGY PARK

EURECAT TECHNOLOGY CENTER

ESADE business school

ESADE CREAPOLIS

408 ha

TOTAL SURFACE

73% PUBLIC USE

37% GREEN AREAS & FREE SPACE

166 ha

GREEN AREAS

25 ha FACILITIES

69 ha

PRODUCTIVE SPACE

1.39 Mm² OF FLOOR AREA

30,000 WORKERS

5,377

HOUSING UNITS

(15,000 RESIDENTS)

47% PUBLIC HOUSING

10,000

COMPANIES

WITHIN A 7KM RADIUS

OF THE SYNCHROTRON

COLLSEROLA NATURAL PARK
8,000 ha



1st STAGE PARC DE L'ALBA FIRST BUILDINGS



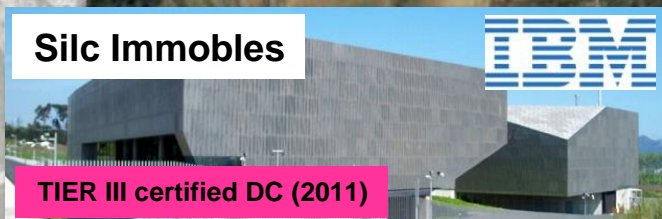
2019



2013



SOCIAL HOUSING (2009)



Silc Immobles



TIER III certified DC (2011)



ALBA
SYNCHROTRON 2009



Estradivarius

2017



TIER III certified DC (2014)

T Systems



Silc Immobles

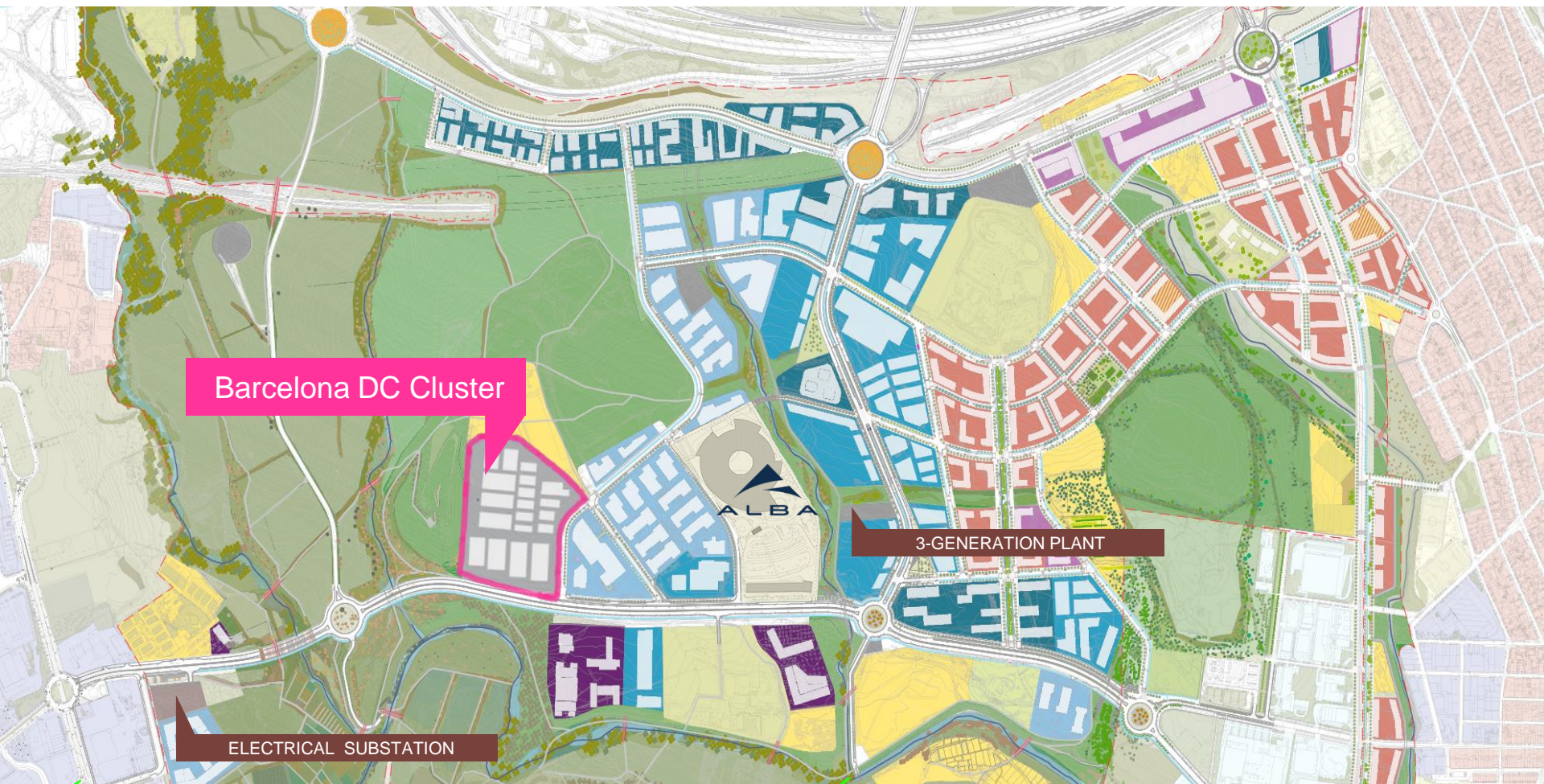
TIER III certified DC (2015)

€560M Third parties' investment (€217M in Data Centers)
ALREADY BUILT FACILITIES (IN OPERATION)

PARC DE L'ALBA PLAYS A KEY ROLE SPEEDING UP AUTHORITIES' ADMINISTRATIVE PROCEDURES

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A PRIVILEGED LOCATION



- ✓ Proximity to the **electrical substation** (220/25 kV) at 750 m and connected to the transmission grid (220 kV)
- ✓ Proximity to **motorways** AP-7 (E-15) and C-58, with two accesses at less than 2 km from the cluster
- ✓ Barcelona **airport** at 33 km (35 min)

- ✓ Next to **emergency services**: fire station (3 km, UAB), police station (1.5 km, road BP-1413)
- ✓ Zone **not subjected to flooding**
- ✓ **Low seismicity** ($a_b = 0.04g$). Presence of Alba Synchrotron
- ✓ Environmental conditions ideal for **free cooling technologies**: cool climate, air **not polluted**

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MAIN CHARACTERISTICS

URBAN PARAMETRES:

Cluster total area: 42,000 m²

Floor Area Ratio (FAR) = 1.6 m²b/m²

The cluster is divisible into plots

Plot division is on demand to fit client's need

Only condition: plot acquired > 1,000 m²

PROTECTION FROM EXTERNAL AGENTS

Topography: **higher level** than surrounding streets.

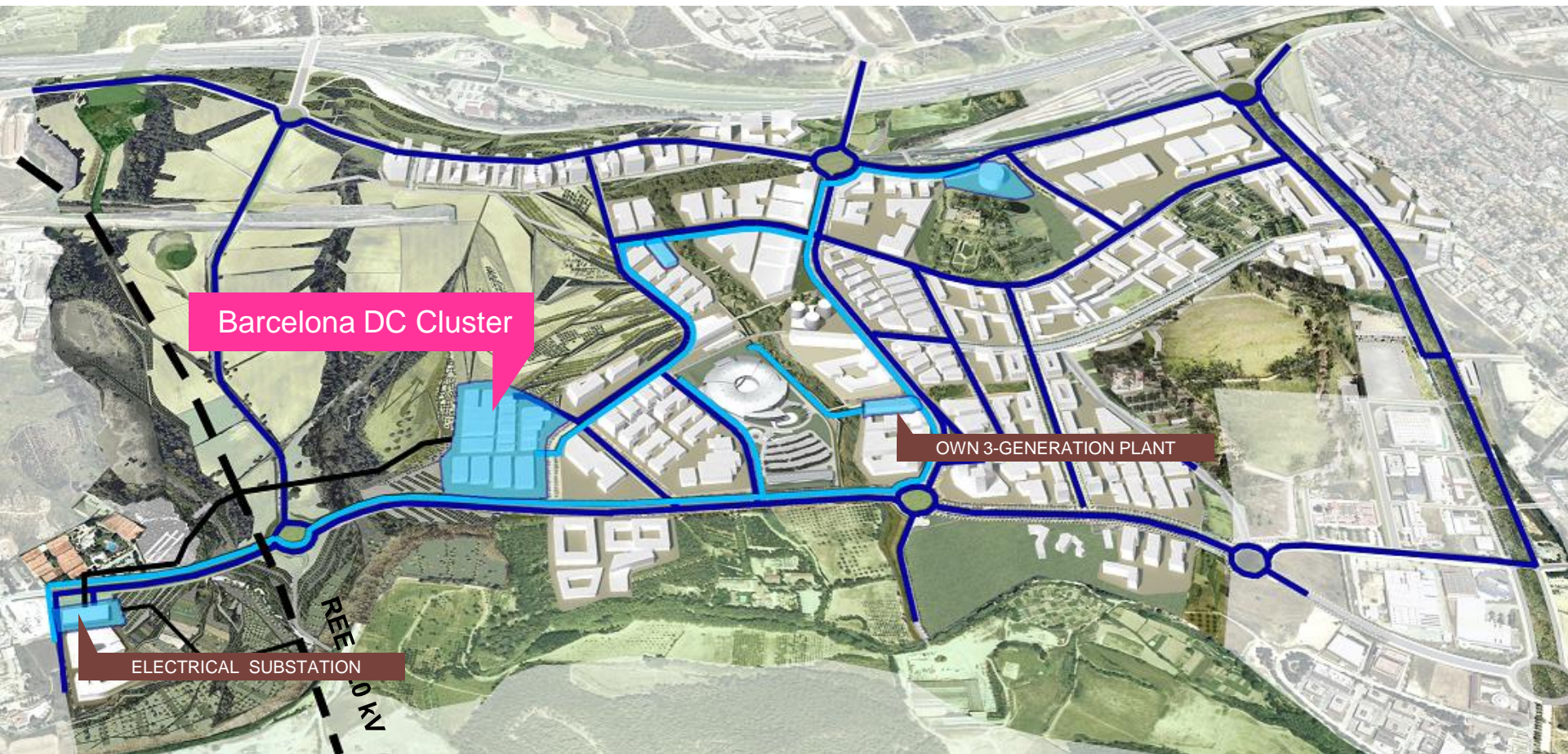
Special fences are allowed (security requirement)

Restricted access to the cluster:

- Pedestrian public street:: limited access to vehicles
- Private street: controlled access (security guard)

Separated visitors parking

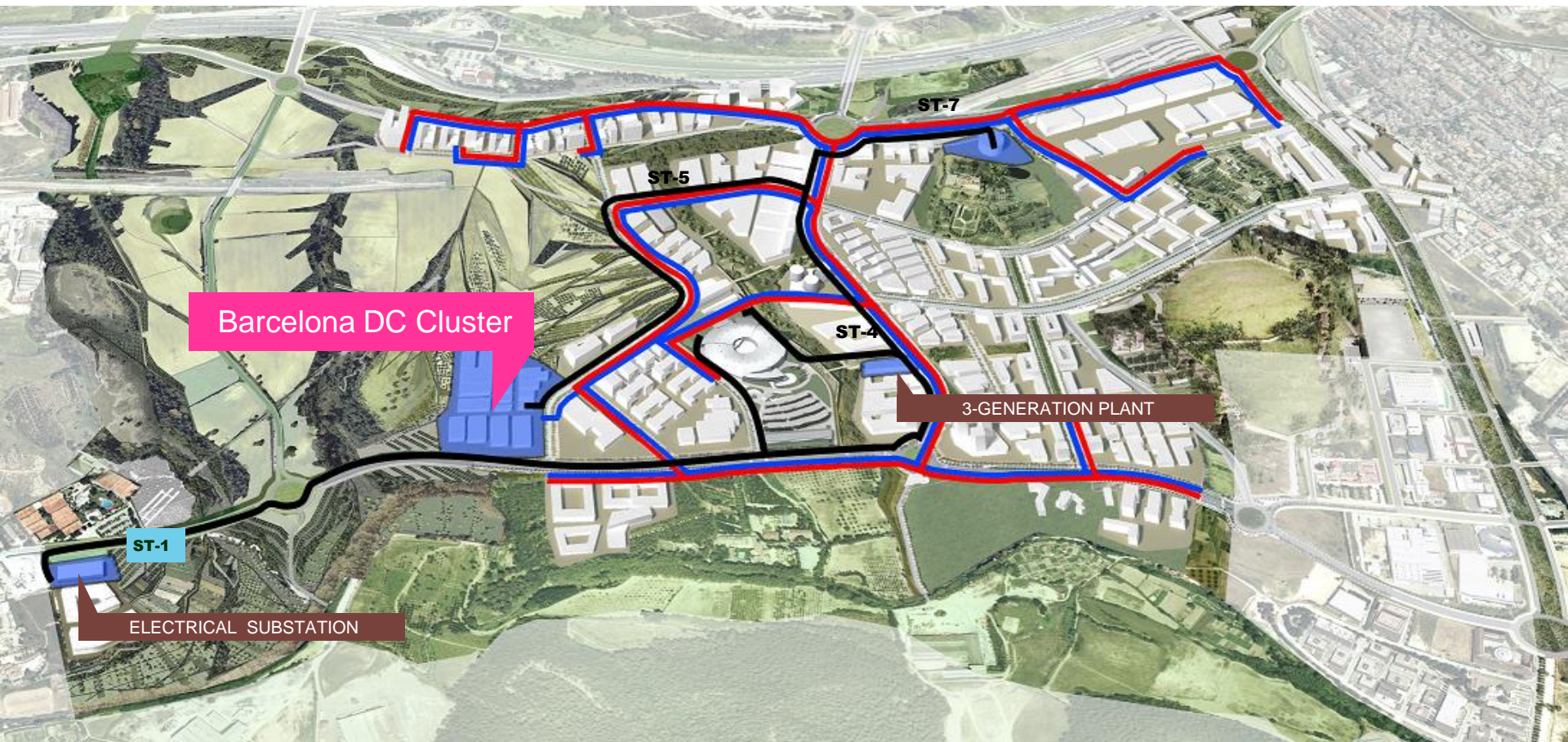
(divisions of the cluster into plots are purely illustrative)



- **HIGH RELIABILITY: DISTRIBUTION SUBSTATION CONNECTED TO HIGH VOLTAGE (225 kV) TRANSMISSION GRID**
- **42 MW CURRENTLY AVAILABLE POWER IN THE ELECTRICAL SUBSTATION AT 25 KV**
- **POWER RATIO 625 W/m²b (1 kW/m² LAND PARCEL)**
- **POSSIBILITY OF REDUNDANT SUPPLY FROM A 24 MW COGENERATION PLANT**

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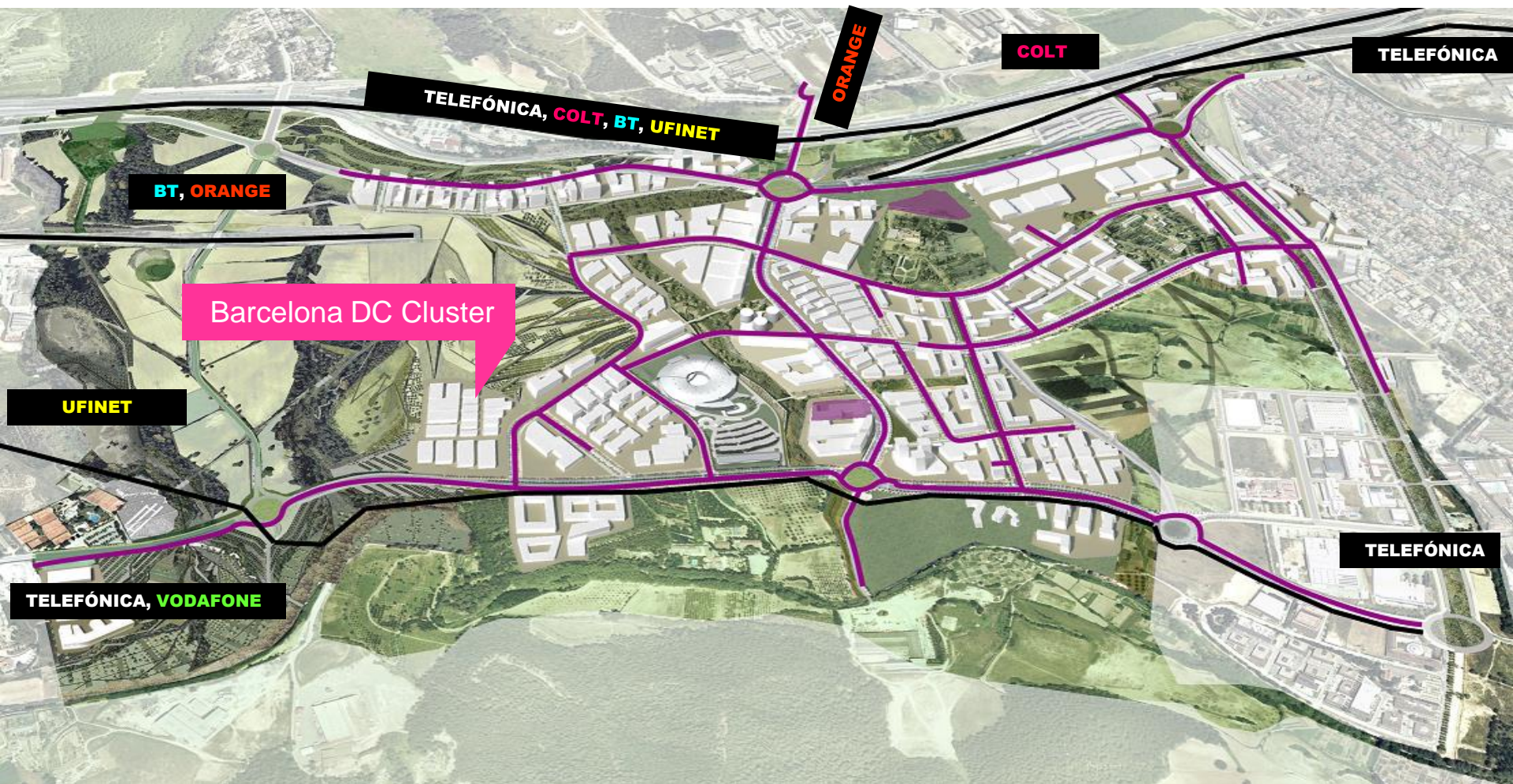
INFRASTRUCTURES: DISTRICT COOLING



- **MODULAR SYSTEM: 4 HIGH EFFICIENCY CO-GENERATION PLANTS (€ 80M INVESTMENT)**
- **COOLING SERVICE OUTSOURCING: ESCO CONCESSION FOR 30 YEARS (STABILITY)**
- **COMPETITIVE FARES AND SPECIAL DISCOUNTS FOR DATA CENTRES OF UP TO 50% OFF THE VARIABLE RATE.**
- **CLUSTER EXPECTED COOLING DEMAND: 14.4 MW_c (RATIO 300 W/m²b)**
- **POSSIBILITY OF NOT INSTALLING REDUNDANT CHILLERS**

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INFRASTRUCTURES: TELECOMMUNICATIONS



- **DIVERSITY OF SERVICES:** 7 TELECOM OPERATORS WITH OWN INFRASTRUCTURE (TELEFÓNICA, VODAFONE, ORANGE, BT, COLT, UFINET, XOC) + RESERVE INFRASTRUCTURE.
- **RELIABILITY:** REDUNDANT ACCESS POINTS FROM EXTERNAL NETWORKS (2 OR MORE PER OPERATOR)
- **MOBILE TELECOMMUNICATIONS:** 3 MULTI-OPERATOR BASE STATIONS WITHIN THE PARK
- **SUBMARINE CABLES** in Barcelona by 2023 (2Africa cable, etc.)

Barcelona DC Cluster

COMPATIBLE WITH HIGHEST CLASSIFICATION STANDARDS (TIER IV - GOLD)

3 TIER III Certified Data Centers / 19 Certified in Spain

Recommendations TIA-942: Telecommunications infrastructure for Data Centers. Annex G (informative)

Table 9: Tiering reference guide (architectural)

	TIER 1	TIER 2	TIER 3	TIER 4
ARCHITECTURAL				
Site selection				
Proximity to flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map	no requirement	not within flood hazard area	Not within 100-year flood hazard area or less than 91 m / 100 yards from 50-year flood hazard area	Not less than 91 m / 100 yards from 100-year flood hazard area
Proximity to coastal or inland waterways	no requirement	no requirement	Not less than 91 m / 100 yards	Not less than 0.8 km / 1/2 mile
Proximity to major traffic arteries	no requirement	no requirement	Not less than 91 m / 100 yards	Not less than 0.8 km / 1/2 mile
Proximity to airports	no requirement	no requirement	Not less than 1.6 km / 1 mile or greater than 30 miles	Not less than 8 km / 5 miles or greater than 30 miles
Proximity to major metropolitan area	no requirement	no requirement	Not greater than 48 km / 30 miles	Not greater than 16 km / 10 miles
Parking				
Separate visitor and employee parking areas	no requirement	no requirement	yes (physically separated by fence or wall)	yes (physically separated by fence or wall)
Separate from loading docks	no requirement	no requirement	yes	yes (physically separated by fence or wall)
Proximity of visitor parking to data center perimeter building walls	no requirement	no requirement	9.1 m / 30 ft minimum separation	18.3 m / 60 ft minimum separation with physical barriers to prevent vehicles from driving closer
Multi-tenant occupancy within building	no restriction	Allowed only if occupancies are non-hazardous	Allowed if all tenants are data centers or telecommunications companies	Allowed if all tenants are data centers or telecommunications companies

TIER CLASSIFICATION DEFINITION (UPTIME INSTITUTE)

TIER I

BASIC SITE INFRASTRUCTURE
AVAILABILITY 99,67%

TIER II

REDUNDANT CAPACITY COMPONENTS
AVAILABILITY 99,74%

TIER III

CONCURRENTLY MAINTAINABLE
AVAILABILITY 99,98%

TIER IV

FAULT TOLERANT SITE INFRASTRUCTURE
AVAILABILITY 99,99%

DATE OF AVAILABILITY:

- Partial (individual data center < 3,500 kW): immediate
- The whole cluster: 18 months

FLEXIBILITY:

- Land plots tailored to fit the needs of each customer (dimensions, floor area):
 - Different kinds of DC implementation: traditional building, modular, containers.
- Contracts: rental / purchase / rent-to-own

IMPLEMENTATION EXAMPLES:



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IMPLEMENTATION EXAMPLE





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