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Secure Sustainable Hosting & Networks

ULTRA Data Centre

ARK Cody Park A101, South Gate, Old Ively Road, Farnborough GU14 0LL

Datanet's Sustainable Data Centre
Power, Cool, Protect, Connect

ARK Cody Park Key Facts	
Location	15 minutes from the M25
Size	36 acres
Ownership	Free hold site
Data Centres	6
Rated Power Capacity	51MW
Grid Connections	4x 33kV from 2 diverse 132/33kV Sub Stations
Site Sub Stations	2x 33kV/11kV with N+1 grid feeds
ISO14001:2015	Yes
ISO27001:2022	Yes
ISO50001:2018	Yes
Connectivity	Multiple tier 1 carriers
Fibre Latency	1.5ms round trip to City of London

Sustainability

Datanet went live in ARK in 2022 as a major upgrade from our previous Fleet Data Centre.

We chose ARK because they have a focus not only reliability and security as you'd expect with any data centre, but sustainability & environmental impacts are at the core of the design philosophy for their entire campus.

ARK is part of the Climate Neutral Data Centre Pact (CNDCP) The pact aims to make all data centres climate neutral by 2030.

ARK's primary goal is reducing the environmental impact of their operations and year on year the stive to innovate new ways to do so.

ARK Cody Park is one of the leading data centre sites when it comes to green credentials.

Facts and Figures

ARK publicise figures on their sustainability improvements regularly **Click Here for Pip Squires 2022 Presentation**.

Low PUE

ARK deploys free air and evaporative cooling techniques to drastically reduce energy usage of the data centre and lower the PUE.

A PUE of 1 describes the energy used to run the servers. But servers need cooling, so more energy is needed.

The closer the PUE to 1, the more energy efficient the data centre is at running an IT load and cooling it.

Typical PUE's of traditional air conditioned data centres are between 1.6 and 2.5.

This means there is a 60% to 150% energy overhead to provide cooling over what the IT load uses itself.

By using free air cooling ARK reduces the typical PUE to around 1.14 saving huge amounts of electricity used to provide cooling for the IT load.

This also leads to lower more predictable costs for the end customers.

Water Consumption

Evaporative cooling, could have an impact on water supplies and reserves as this can require large amounts of water.

ARK therefore use rain water harvesting and treatment as a water supply and are working towards running Cody Park purely on harvested rain water.

Eliminating Diesel

While backup generators are critical they are a large source of emissions when it comes to CO2, but also pollutants such as NOx and other particulates.

ARK has switch all their backup generators to Hydrotreated Vegetable Oil (HVO) which has reduced Scope 1 emissions by 90%. As well as reducing other harmful pollutants .

Renewable Energy

ARK buys only REGO electricity and is powered by 100% renewable energy.

The data centres also have photovoltaic solar systems on their roofs.

Construction

Concrete accounts for 8% of carbon emissions globally. ARK's data centre buildings are made from steal, not only does this reduce construction time, but it allows 90% of the building materials to be recycled in the future.

Electric Vehicles

ARK provides electrical vehicle charging points at the data centre, and aims to have 50% of car parking spaces with charging points in the near future.

CLIMATE NEUTRAL DATA CENTER

Biodiversity

With beehives, tree planting and donating portions of the campus to local wild life and wild flowers aim to reduce impact on the local environment.

Reducing Waste

ARK is a zero waste to land fill business and reduces its use of raw materials whenever possible and encourages re use and recycling where ever possible.

In 2020 96% of ARK's waste was recycled while 4% went to energy recovery.

Power Diversity

A101 is a 4.5MW data centre and contains 3x 1.5MW sub modules; each has it's own energy centre with two data halls of 760kW.

A 1.5MW energy centre consists of:

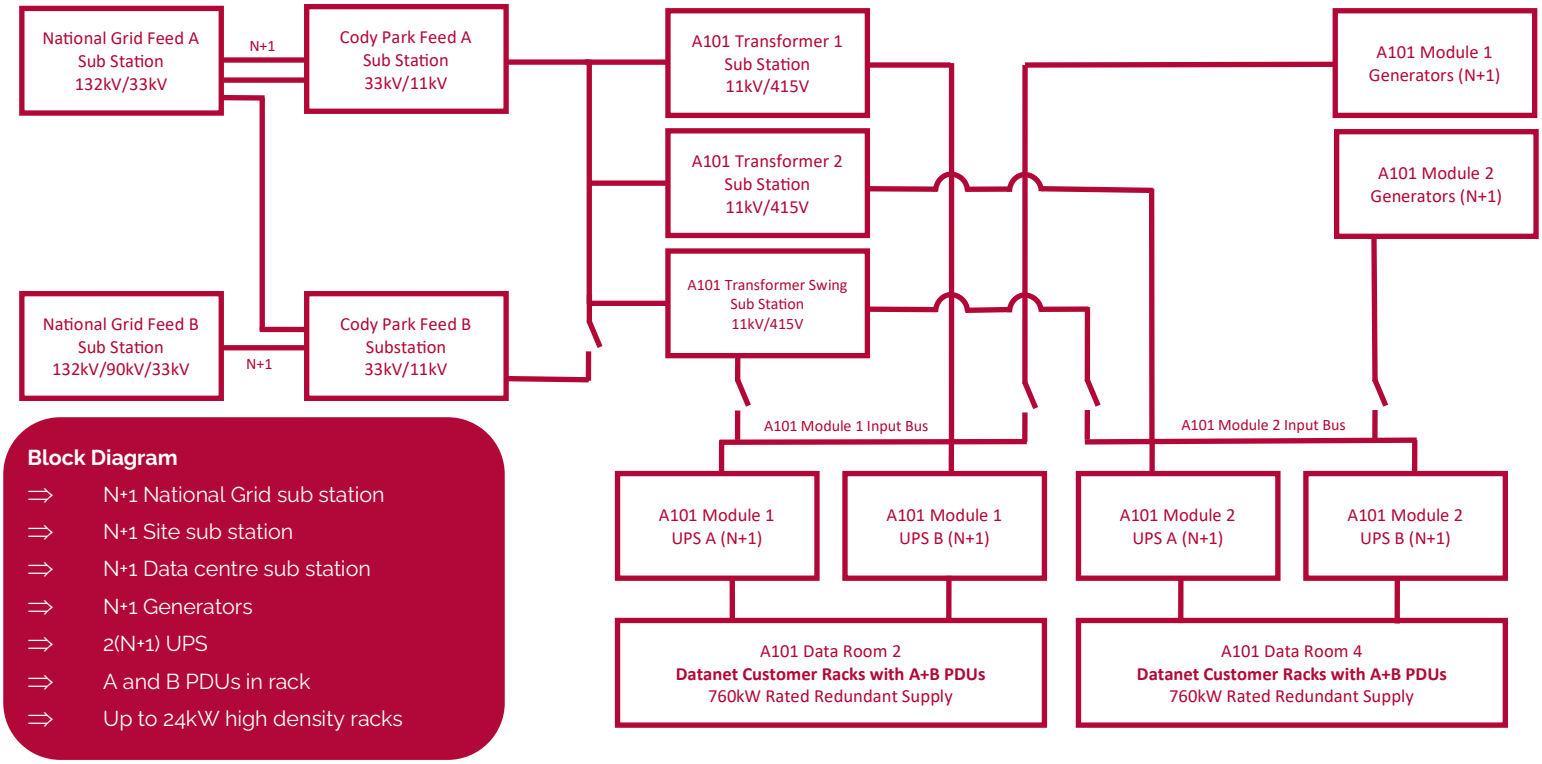
- ⇒ 3x1250kVA standby generators (N+1)
- ⇒ 8x400kVA UPS modules configured as 2(N+1)
- ⇒ UPS output delivered as A and B bus bars
- ⇒ Independent switch gear
- ⇒ Independent 11kV/415V transformer (N+1 for A101)

Datanet's two data halls are in separate modules therefore fed by separate energy centres offering extra diversity for multiple racks.

Power Delivery

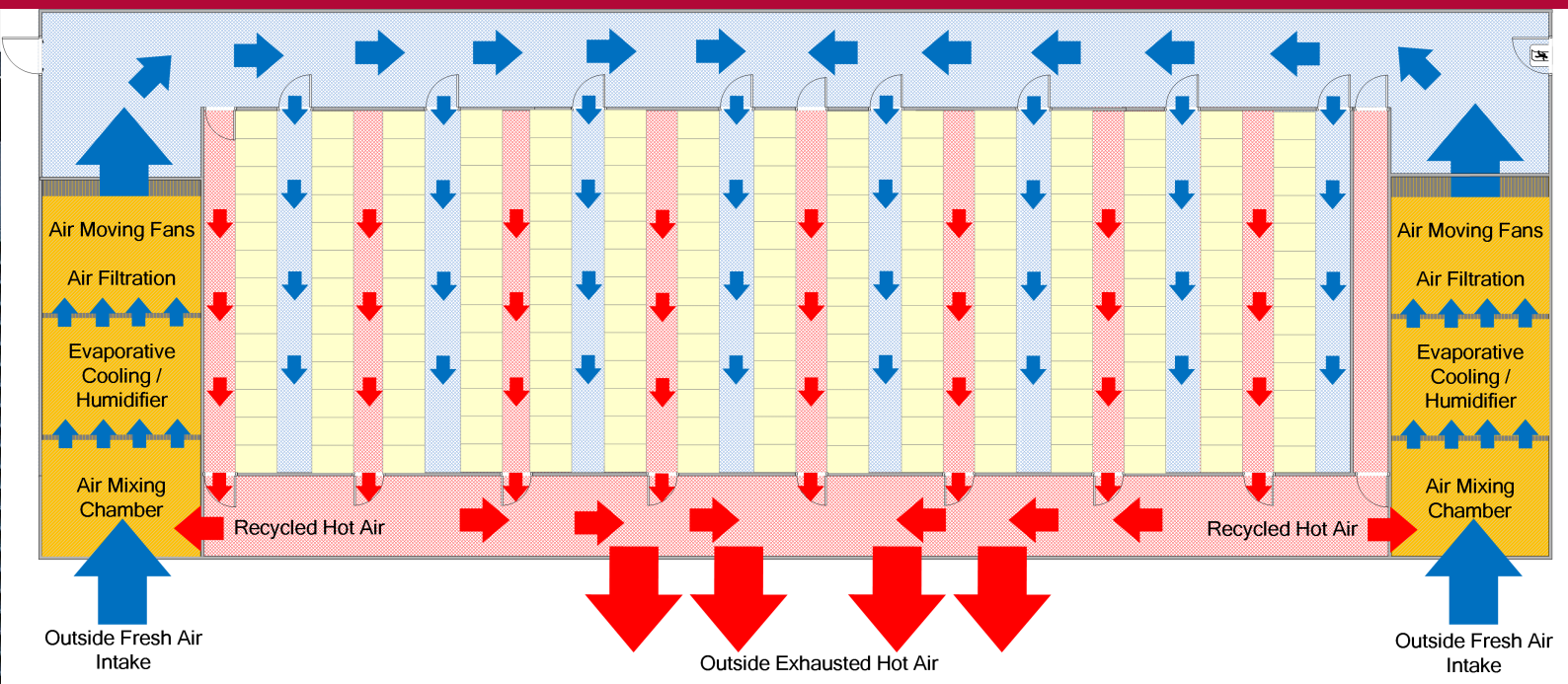
ULTRA Racks are fed from two diverse UPS bus bars with independent distribution boards, switch gear and UPS's.

This is delivered to the rack as two independent APC PDUs, the left side PDU connected to the A feed and the right side PDU connected to the B feed.



Block Diagram

- ⇒ N+1 National Grid sub station
- ⇒ N+1 Site sub station
- ⇒ N+1 Data centre sub station
- ⇒ N+1 Generators
- ⇒ 2(N+1) UPS
- ⇒ A and B PDUs in rack
- ⇒ Up to 24kW high density racks



Free Air Cooling Over 95% Year Round

Using advanced Blade Room design, with free air and evaporative cooling techniques ARK provides one of the most energy efficient low PUE data centres in the world.

Each data hall has two complete independent "Air Optimiser" systems which can each individually handle the entire IT load of the hall providing an N+N resiliency.

The Air Optimisers provide cool air treated to the correct temperature and humidity into a shared cold corridor area.

Each cold isle then uses louvers built into the main entrance door to the isle to control the amount of air drawn in. These are automatically adjusted to provide only the right amount of air flow that is required to cool the IT load of that specific isle; so no cooling capacity is wasted.

Every rack has blanking panels to contain all the cold air in the cold isle so it can only pass to the hot isle if it has been drawn through a server where cooling is actually needed.

Once the air reaches the hot isles it is then drawn into the main hot isle corridor, where it is either rejected to the outside environment using exhaust louvers, or it can be recycled into the Air Optimiser to warm fresh outside air.

When the outside air temperature is below that required from the data hall the cooling is completely controlled by mixing outside cold air with some recycled warm isle air. No chilling or cooling is required to maintain the cold isle temperatures.

If the outside temperature is up to 10 degrees warmer than the required cold isle temperature, water evaporative cooling is used to bring the air temperature down by up to 10 degrees; which is an extremely energy efficient method to provide cooling.

Encase of extreme high temperature weather conditions each Air Optimiser also contains additional typical DX chiller based cooling with enough capacity to run the full data hall on DX cooling.

While two Air Optimisers themselves provide N+N resiliency, inside each optimiser there is component levels of resiliency far great than N+1. For example each unit could lose multiple fans and still operate at the full 760kW cooling capacity.

Industry Leading Security

24 Hour
Security Patrols

Campus Wide High
Security Fencing

Government & Financial
Security Levels

Individual DC Compounds

Biometric Authenticated
Access Cards

CCTV
Inside & Outside

Man Traps & Turn Styles
Tailgating Preventions

Individual Rack Isle
Access Control

Each Data Centre has it's own compound with a 4M high perimeter

Secure loading bay area within the compound.

A101 Data Centre Facts

Building Design	Modular Bladerooms
Tier	Tier III Certified
IT Load Power Rating	4.5MW
Energy Modules	3
Data Halls	6 (2 per module)
Data Hall IT Load Power Rating	760kW
Energy Centre IT Load Power Rating	1.5MW
Energy Centre HV Input	N+1 11kV/415v transformers
Module Generator Capacity	3x 1250kVA at N+1
Module UPS Capacity	8x 400kVA UPS at 2(N+1)
LV Power Distribution	A+B Feeds
Data Hall Size	5,800sqft x6
Data Hall Racks	195 x6
Primary Cooling	Free Air & Evaporative Cooling (N+N)
Secondary Cooling	DX Chillers (N+N)
Fire Detection	VESDA Sampling Units
Fire Suppression	Gaseous Suppression
Loading Bay	1
Goods Lifts	2
Kitchens	2
Toilets	6 (1 Disabled)
Showers	1
Client Build Areas	9 (1 for Datanet)
Security Office	Main Entrance
Man Trap Entrance	1
Secure Compound Fence	4M High
Turn Style Entrance	1
Goods Delivery Gates	2
Power Cable Management	Above Rack Distribution Boxes
Network Cable Management	Above Rack Cable Trays
Cable Paths Between Floors	2 per Hall
Cable Paths Between Halls	4 (between Datanet's Halls)
Meet Me Rooms (MMR)	3 (in two diverse modules on ground floor, one on first floor)

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