EdgeDC+

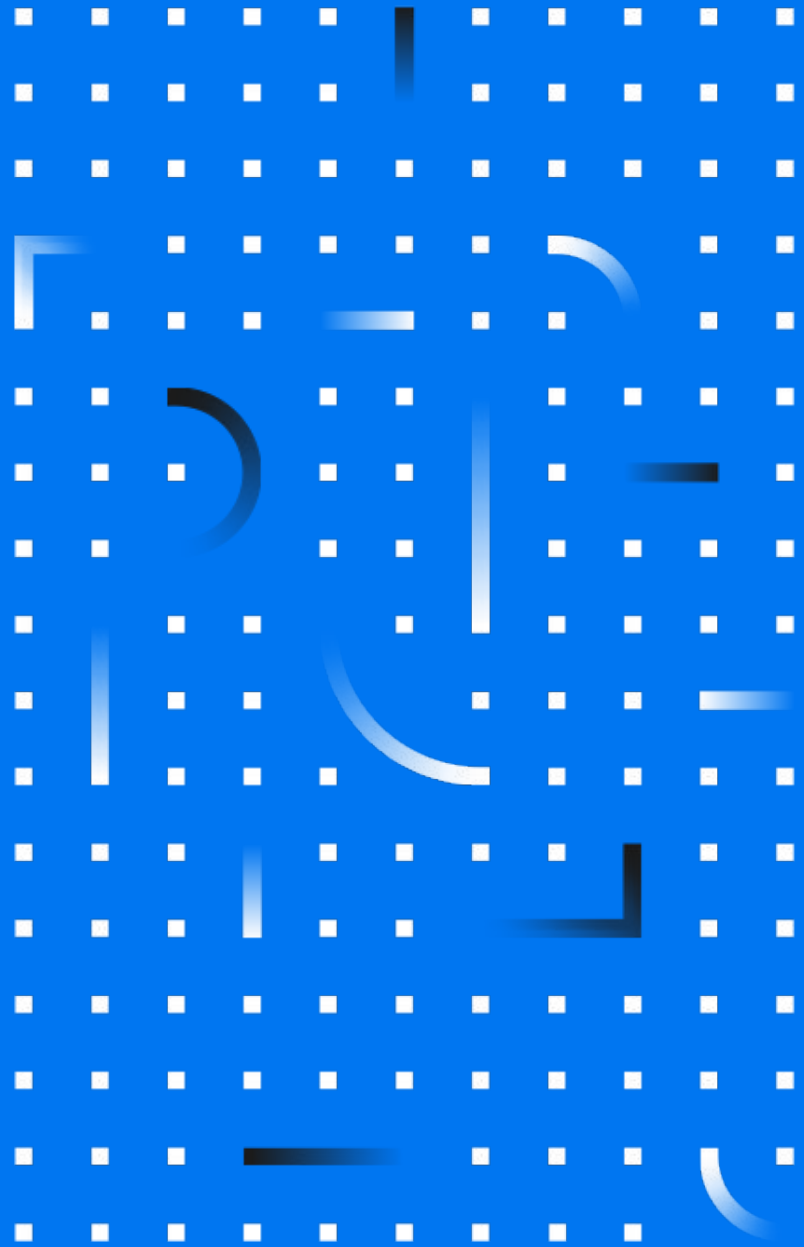
Low-risk, high value

ACCELERATING DATA CENTERS' RETURNS SINCE 1991

ALTRON MODULAR

01

About



Modular

- Building on 30 years of experience in DC design, build and operation
- EU-quality product delivered anywhere globally
- Vendor with system-integrator mentality
- Optimized product for Edge Data Centers
- AI enhanced Digital Operation & Maintenance modes.


EdgeDC+

ALTRON MODULAR

Rapid growth in Data Center industry

- **Colo, Cloud, Telco services providers**
- **Government Mission Critical Data Center**
- **National security and private clouds**

They all have same challenge

Supply new capacity at the scale and industry quality for controlled price and yet on time.

This has been challenge of industry for decades and now it has become a global race for quick capacities to accommodate demanding clients.

Altron Modular has portfolio of prefabricated products that has carefully sized parameters meeting the demand and yet utilizing the experience in process from project to project.

At a glance

Czech Market

Industry Leader in the Czech rep.

Global Market

Among top 5 Prefabricated Modular Data Center vendors
Reputable D&B contractor

Local Presence

Czech Rep, Slovakia,
USA, UK
UAE, KSA (structuruing)

Team

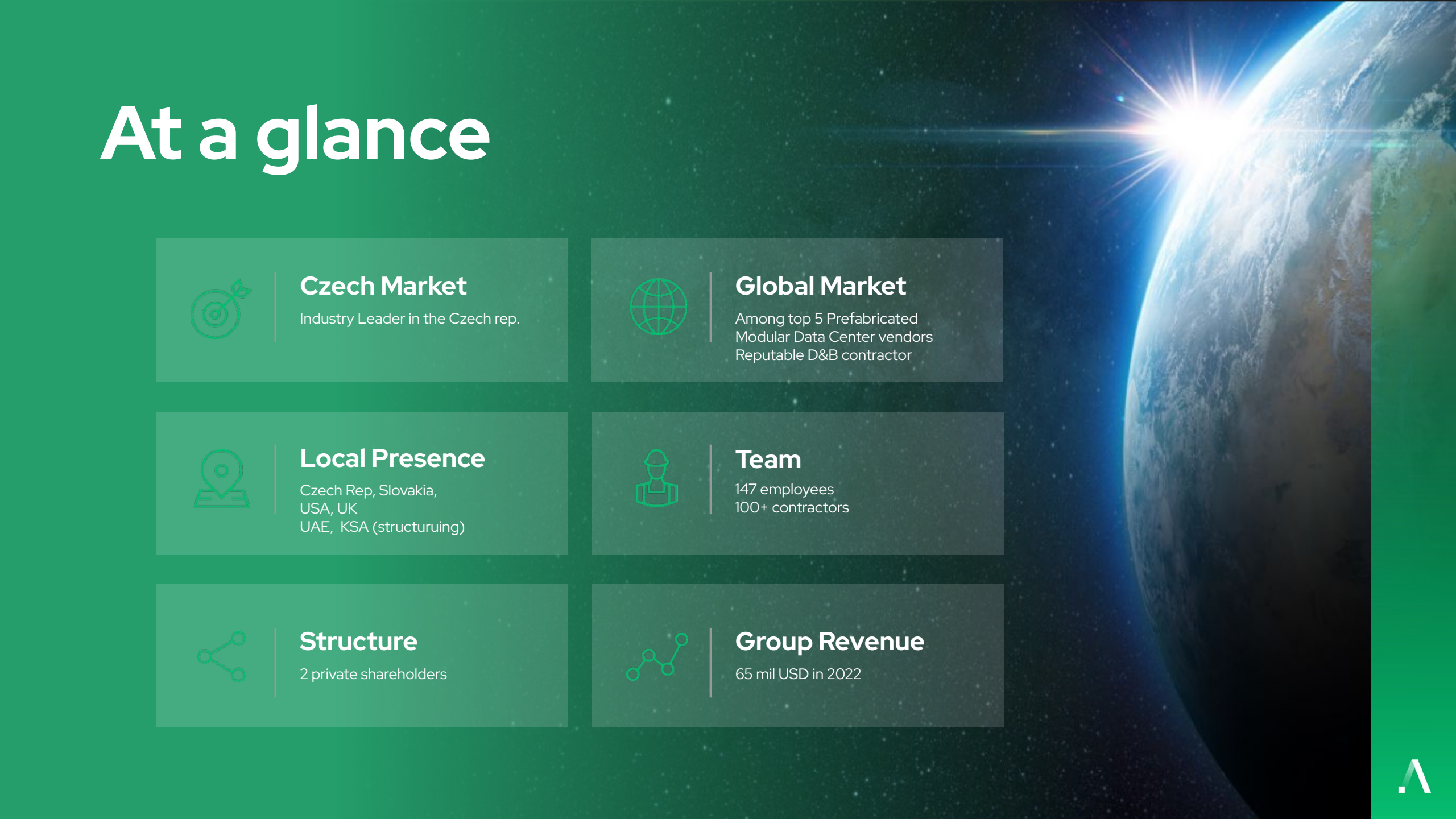
147 employees
100+ contractors

Structure

2 private shareholders

Group Revenue

65 mil USD in 2022



Why Altron?

30 +

more than 30 years on the market

1000 +

Delivered projects globally

8 %

Year-to-year investment to R&D

100 +

Field services experts

Know-how

Subject matter with strong experience in design, build and operation, from which our know-how derives.

Innovation

Our experience give us platform too execute our vision into reality based on proven practice and methodologies.

Trust

Building strong relationships with clients, partners, experts and maintain long-term partnerships that does differentiate us.

References


SKUPINA ČEZ


DISTRIBUCE


SKODA


CETIN
ČLEN SKUPINY PPF


vodafone


SEZNAM.CZ


PPF


SOCIETE
GENERALE


POLICIE
ČESKÉ REPUBLIKY


ooredoo


T


etisalat


MUBADALA


GDH
Gulf Data Hub


Microsoft


IBM


DELL

EdgeDC+

02

Product

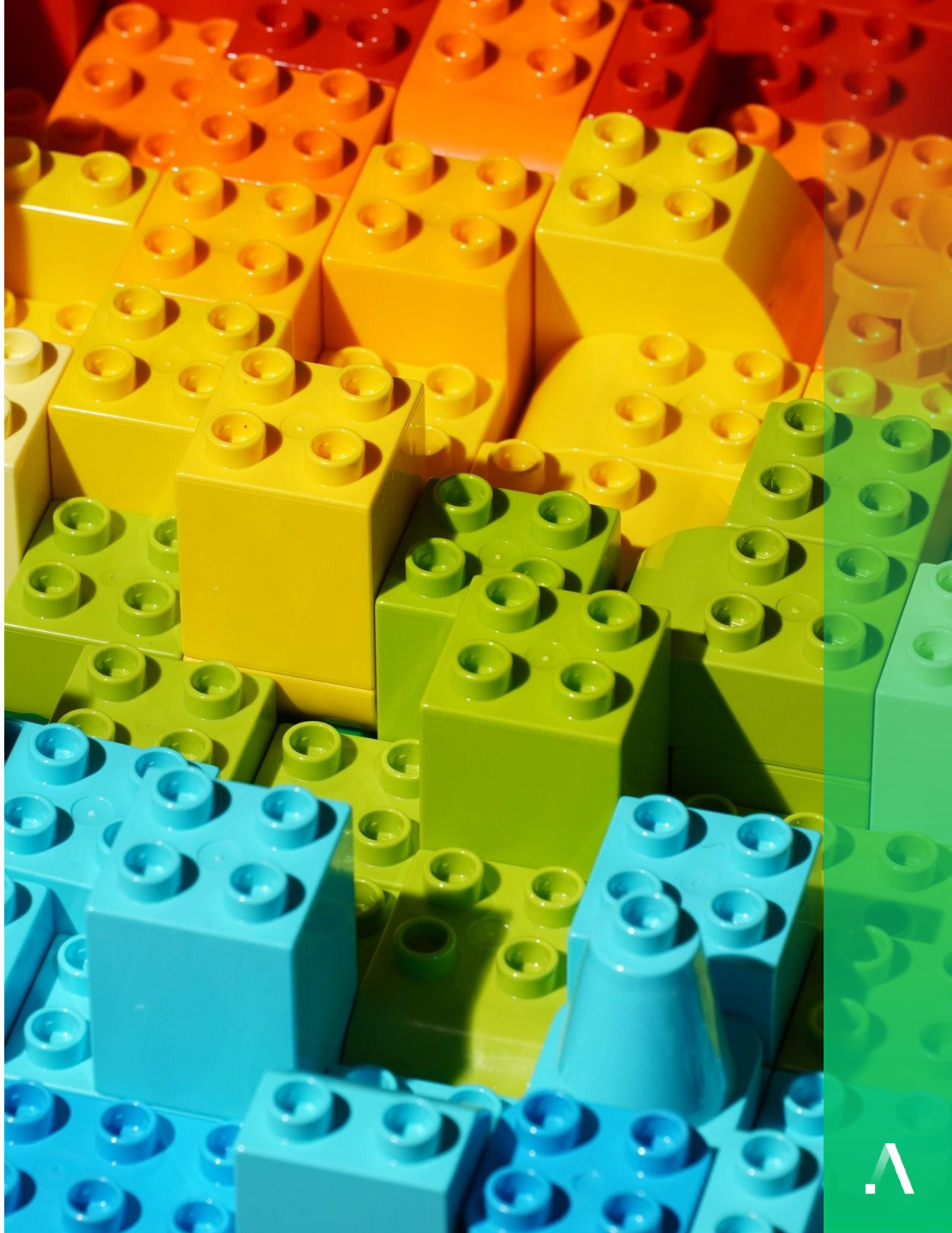
ALTRON MODULAR

Scalability

Defining the main parameters of EdgeDC+

- Total Connect Load & Power Density
- IT Pods & Racks
- Critical Power and Critical Cooling Pods
- Modules

Standard product vs. customization



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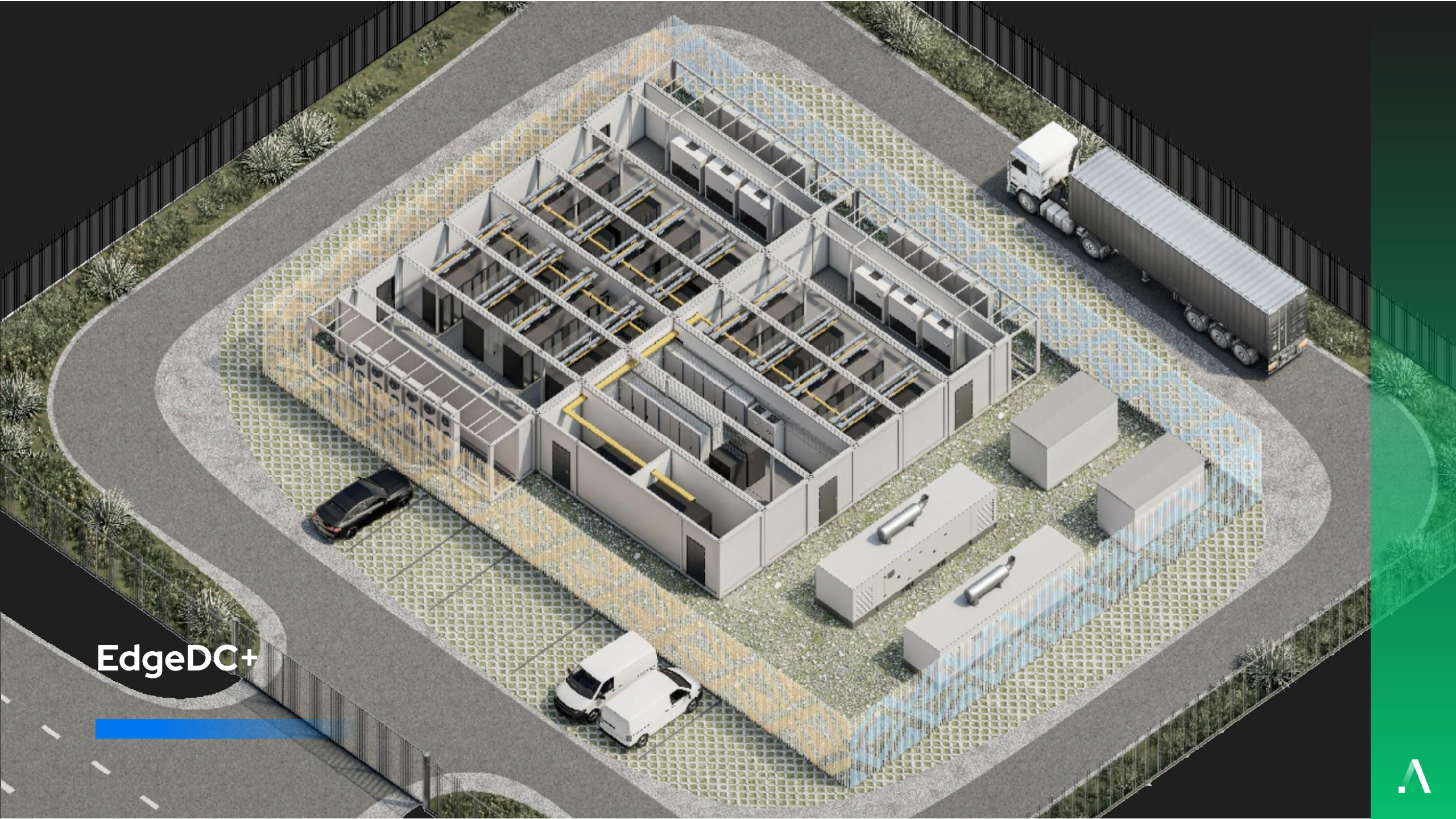
EdgeDC+ Drivers

Parameters Summary: TCO driven with optimized CapEx + OpEx

- Use Case – cloud, colocation, hosting DC services, network infrastructure services, government, and private cloud.
- Capacity – Grow as you need (100kW to 1 000kW).
- Availability – MultiTier Redundancy – 2N in power supply
- Power density averaging 5 – 10 kW per rack (1kW to 20kW per rack)
- Smart space utilization, and caging.
- Vendor-neutral approach using best of breed EU certified products
- Low PUE @ 1.5 in KSA, Dammam – 90% capacity & above
- Unique flexibility to respond to a wide range of client's requirements (scale up and down), re-deployment capability
- Altrix an advanced management and control system at DC level to allow unmanned operation and virtual operator features



EdgeDC+

EdgeDC+

ALTRON MODULAR

Product

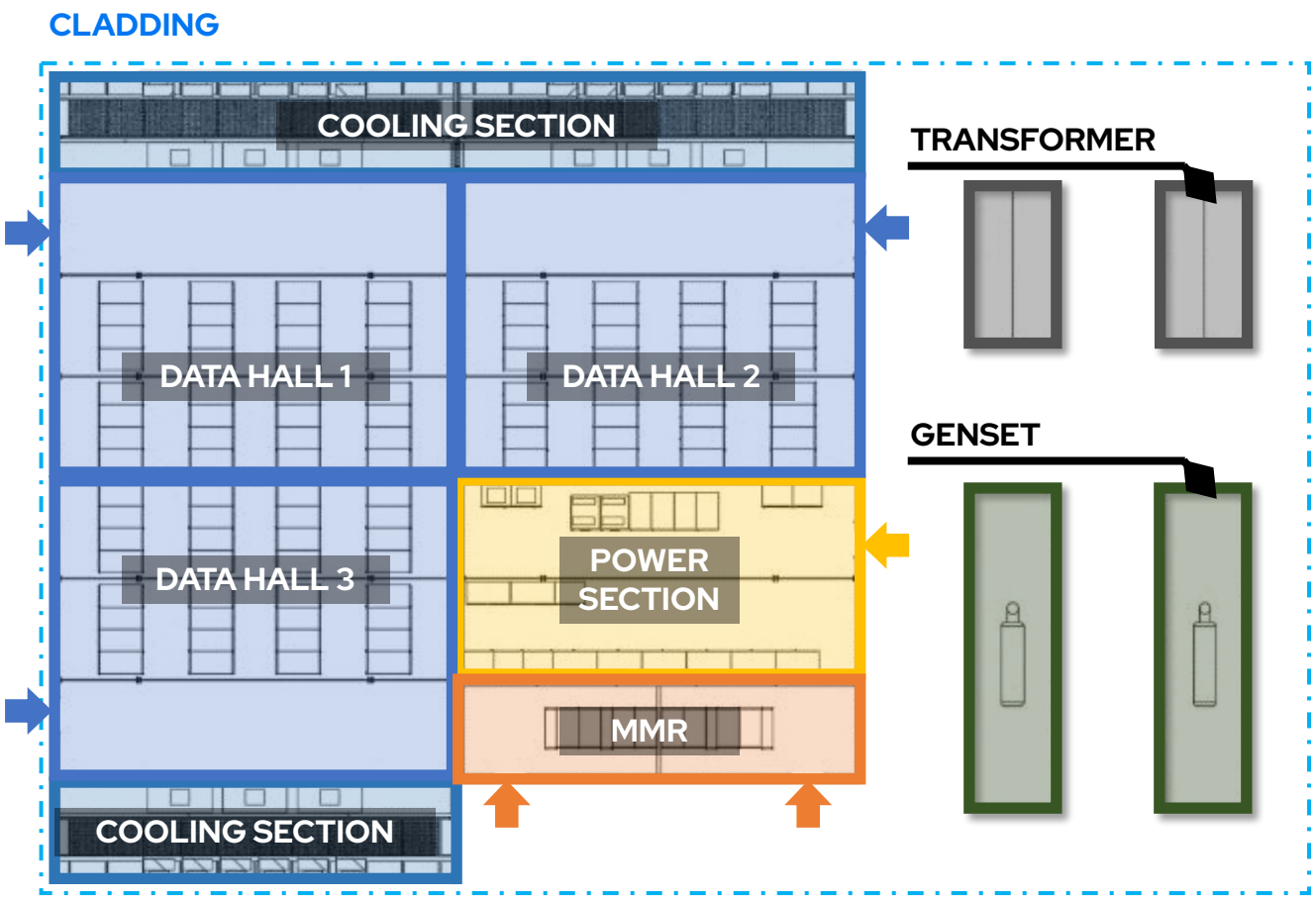
	EdgeDC+ 100	EdgeDC+ 200	EdgeDC+ 300	EdgeDC+ 500
ICT load capacity	100 kW	200 kW	300 kW	500 kW
Rack capacity	18 – 32	36 – 64	54 – 96	90 – 160
Power density/rack	4 – 6 kW	4 – 6 kW	4 – 6 kW	4 – 6 kW
Power supply redundancy	2N	2N	2N	2N
Cooling redundancy	N+1	N+1	N+1	N+1
Cooling Methods	DX	DX	DX	DX

ALTRON MODULAR

Product

	EdgeDC+ 200	EdgeDC+ 400	EdgeDC+ 600	EdgeDC+ 1000
ICT load capacity	200 kW	200 kW	600 kW	1000 kW
Rack capacity	18 – 24	36 – 48	54 – 72	76 – 104
Power density/rack	8 - 12 kW	8 - 12 kW	8 - 12 kW	8 - 12 kW
Power supply redundancy	2N	2N	2N	2N
Cooling redundancy	N+1	N+1	N+1	N+1
Cooling Methods	DX / CW / Dual	DX / CW / Dual	DX / CW / Dual	DX / CW / Dual

EdgeDC+



EdgeDC+ 300

ICT Load:
300 kW

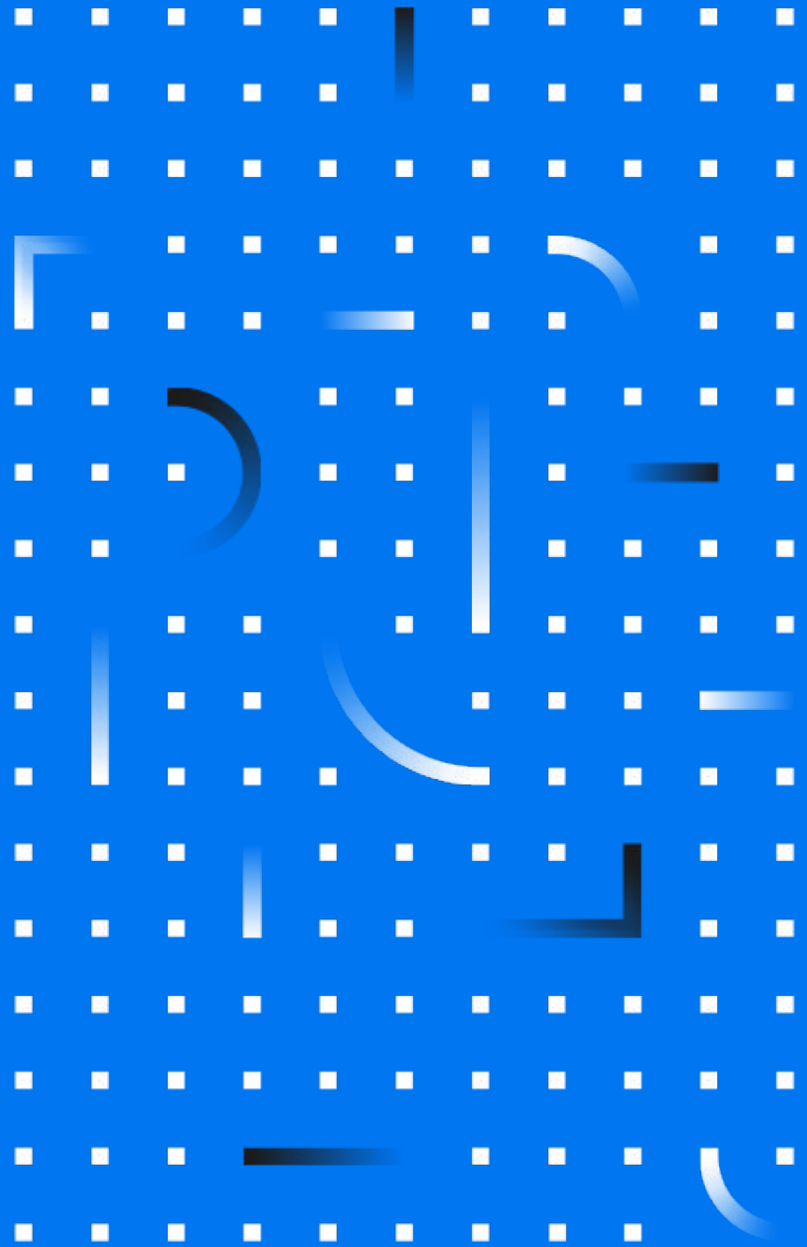
Racks:
Up to 96

Power:
2N

Cooling:
N+1

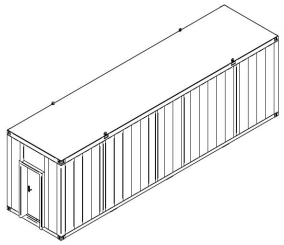
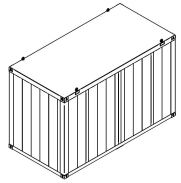
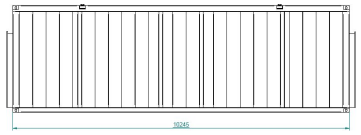
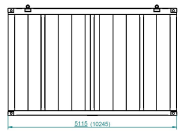
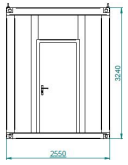
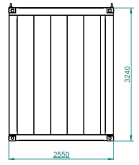
03

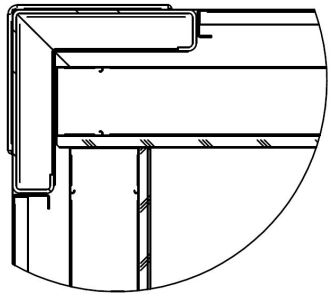
Modules

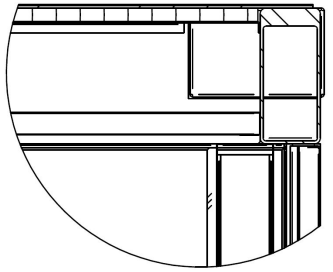


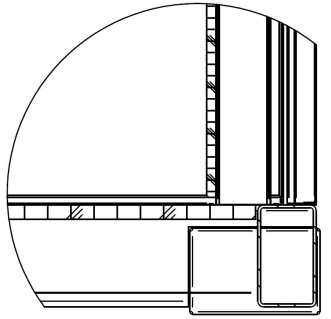
ALTRON MODULAR

Modules

Module Size	FULL	HALF
Perspective View		
Side View		
Front/Back View		
Length (external)	10 927 mm	5 463 mm
Width (external)	2 720 mm	2 720 mm
Height (external)	3 240 mm	3 240 mm
Height (internal)	2 900 mm	2 900 mm
Wall thickness	150 mm	150 mm







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ICT Pod

Whitespace area each module:

29 m2 / 4 rows

Rack capacity:

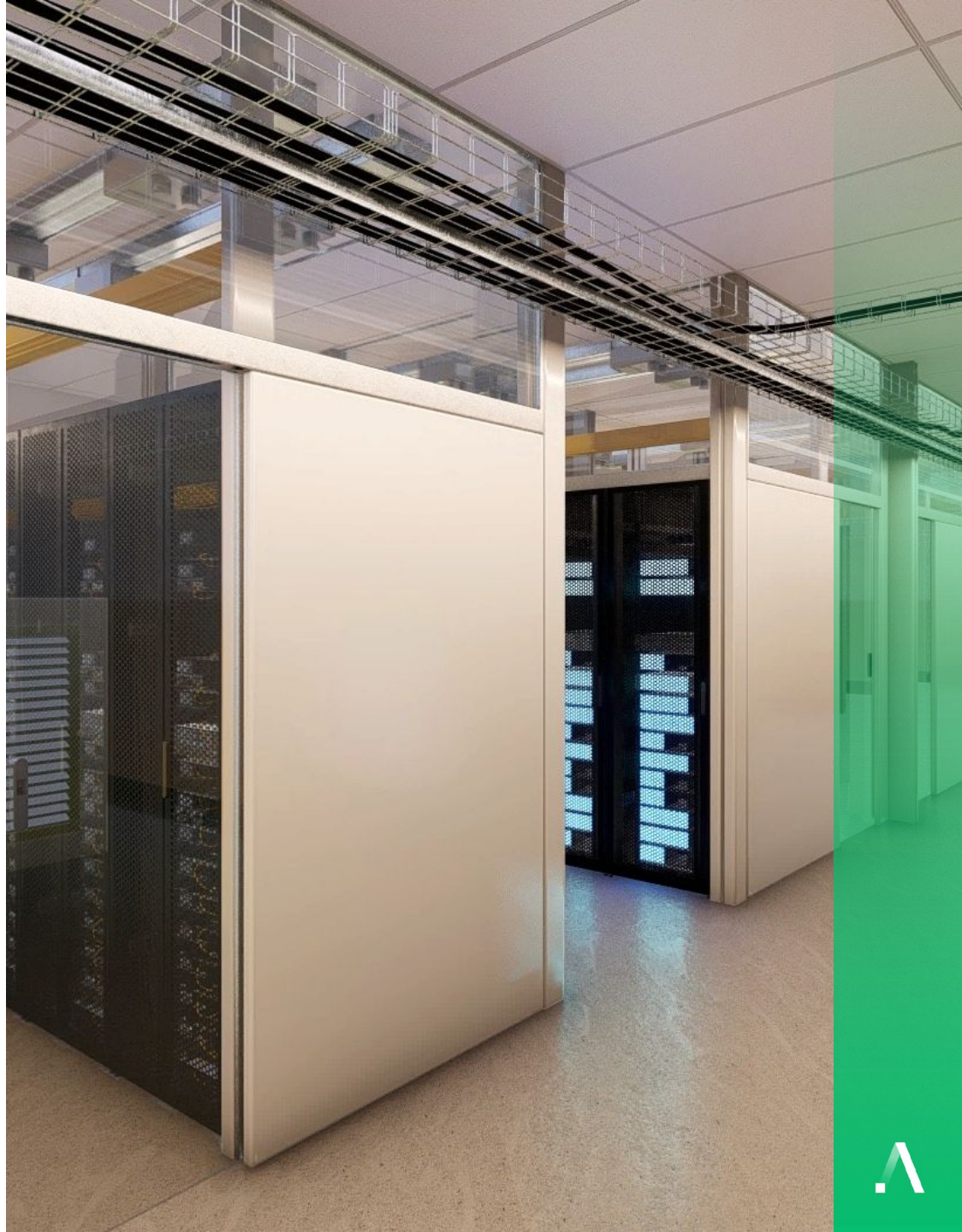
12× 16×

800mm 600mm

- 2 independent busbars per each row
- Flexible caging system

Optional delivery:

- Hot aisle containment
- Racks and PDUs



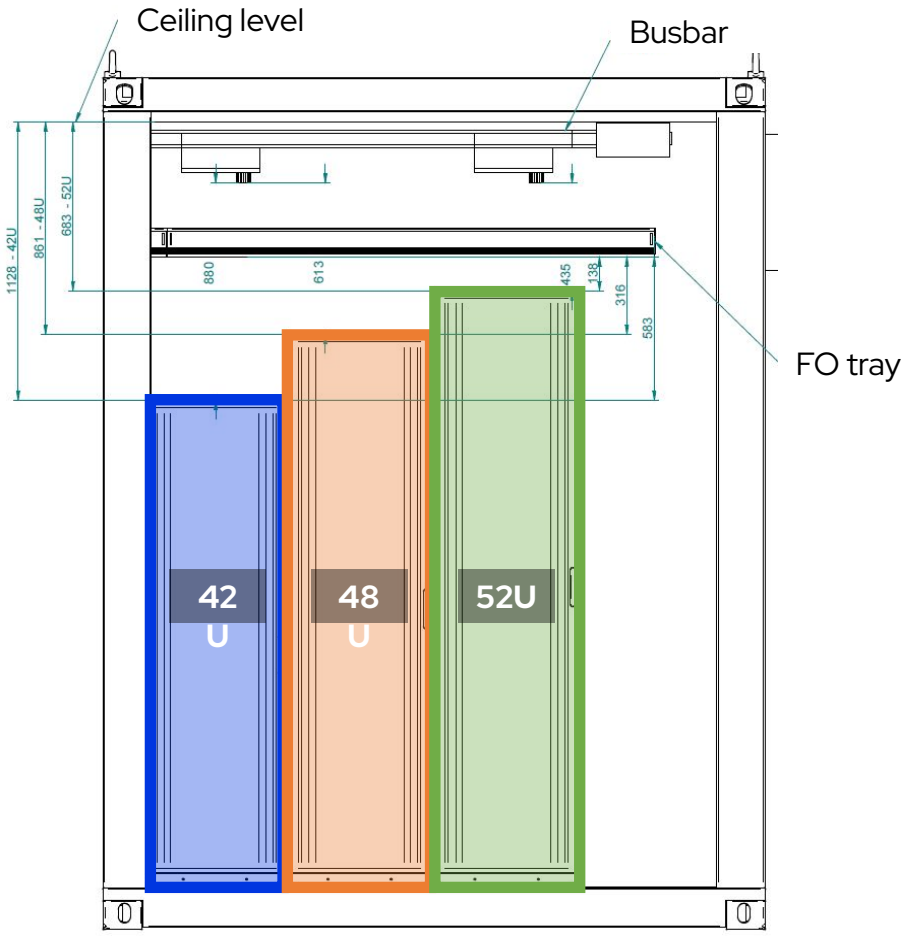
ALTRON MODULAR

Scalability

Rack height flexibility:

42U – 52U

- Extra high ceiling to accommodate up to 52U
- Sufficient clearance from overhead busbars and cable trays



EdgeDC+

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Additional Structures

Cladding

- Reducing heat gains
- Increase lifecycle of equipment

Roofing

- Reducing direct heat and temperature on outer shell
- Unique emotion and project touch


EdgeDC+

EdgeDC+

04

Critical Power

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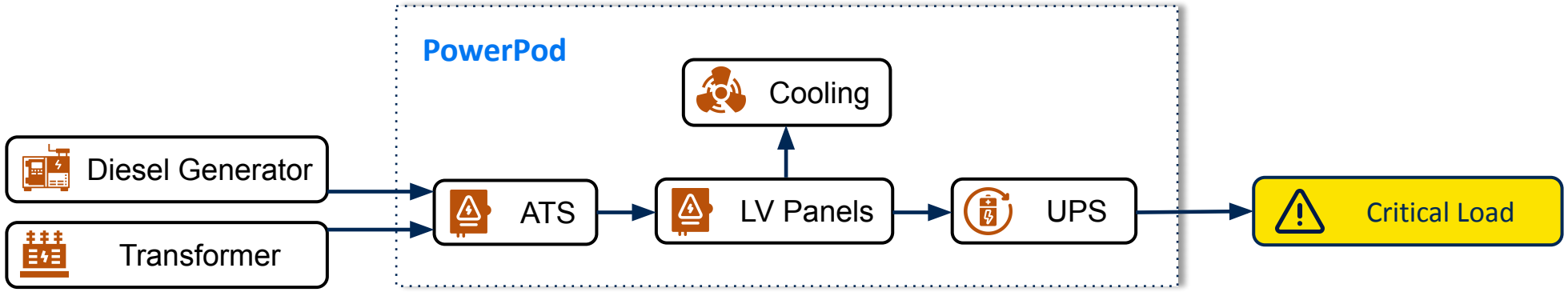
Scalability

	PowerPod 250	PowerPod 500	PowerPod 1000	PowerPod 1500
Critical load capacity	**250 kW**	**500 kW**	**1 000 kW**	**1 500 kW**
Modules	**1**	**1**	**2**	**3**
Power supply redundancy	**2N**	**2N**	**2N**	**2N**
Cooling redundancy	**N+1**	**N+1**	**N+1**	**N+1**



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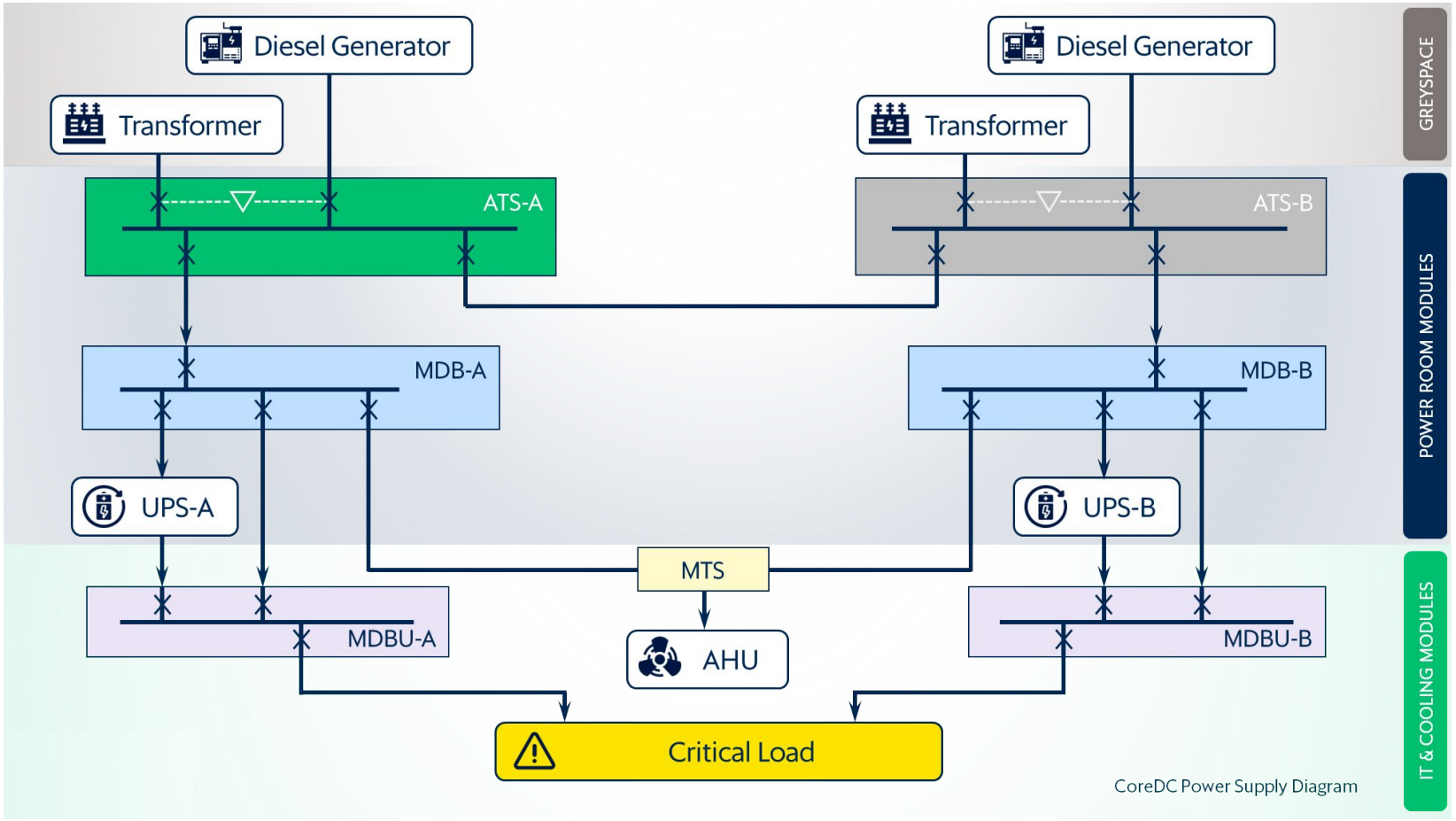
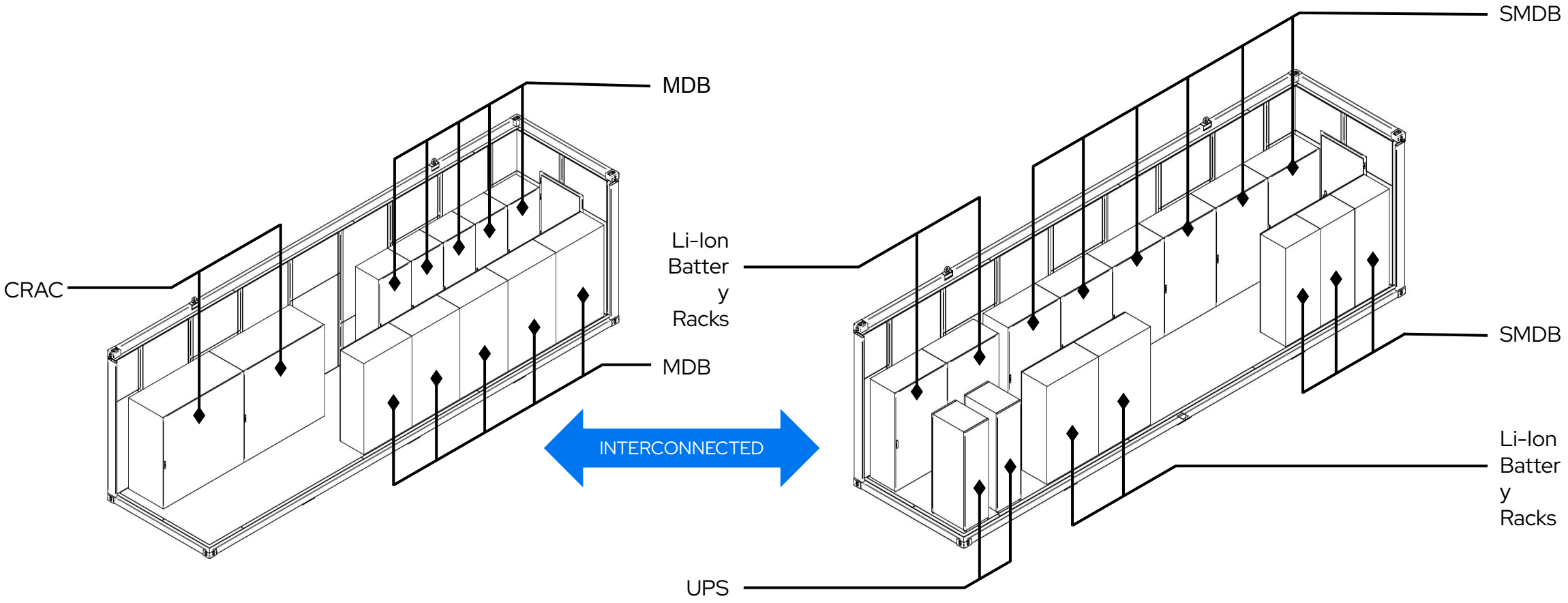
Power Redundancy

2N / DPR Dual Path Redundancy



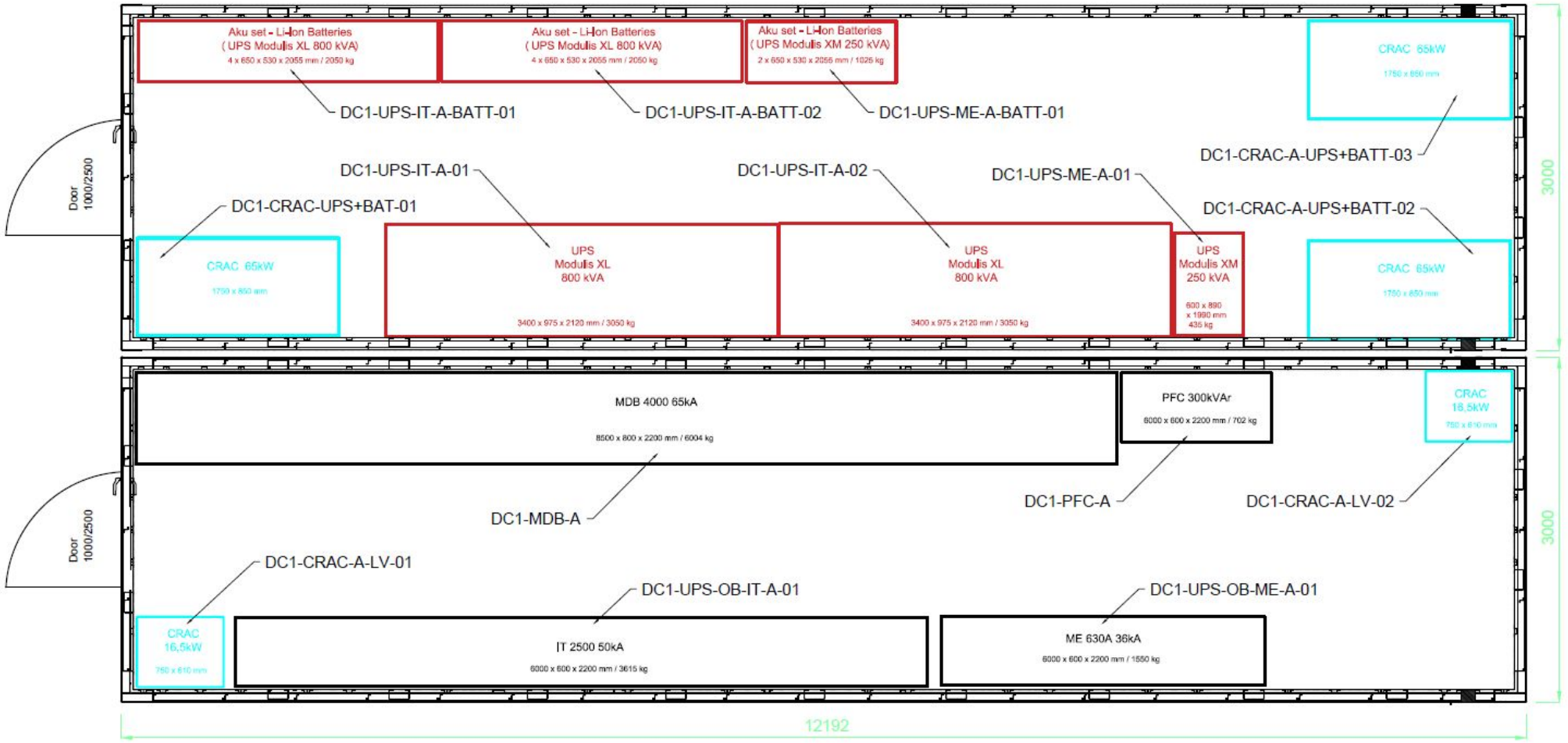
ALTRON MODULAR

Power Pods



ALTRON MODULAR

Layout



05

Critical Cooling

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Critical Cooling Methods

- **DX with Direct free-cooling** - feasible only in areas with favorable temperatures, saves on operating costs when in free-cooling mode
- **Pure DX** - the easiest to deploy, but potential environmental impact (green house gases, flammability)
- **Chilled water** – great option in areas with district chilled water supply (ME), more complicated design to enable concurrent maintainability
- **Dual fluid** cooling units combining both DX+CW

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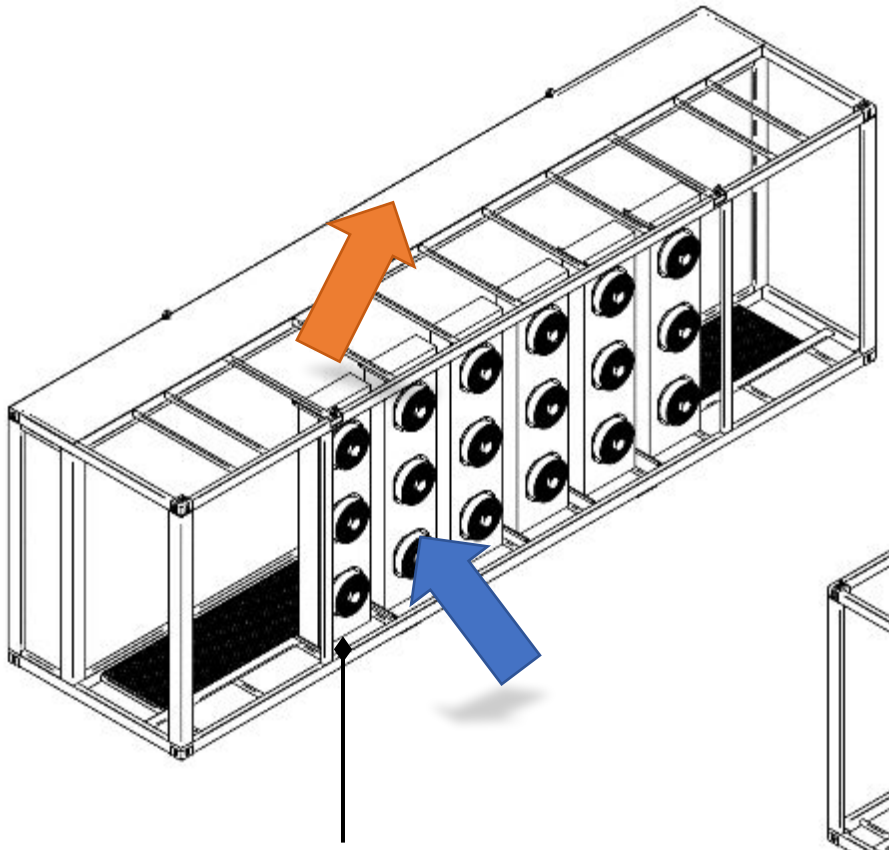
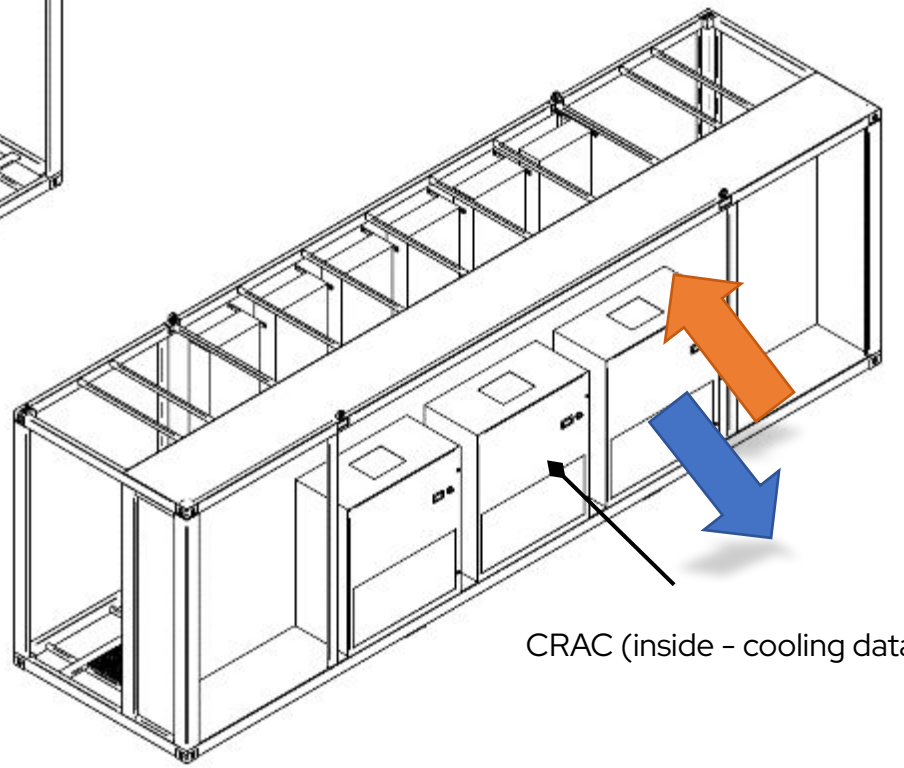
DX Cooling Pod



Condensers section
(outside)



CRAC (inside - cooling data hall)

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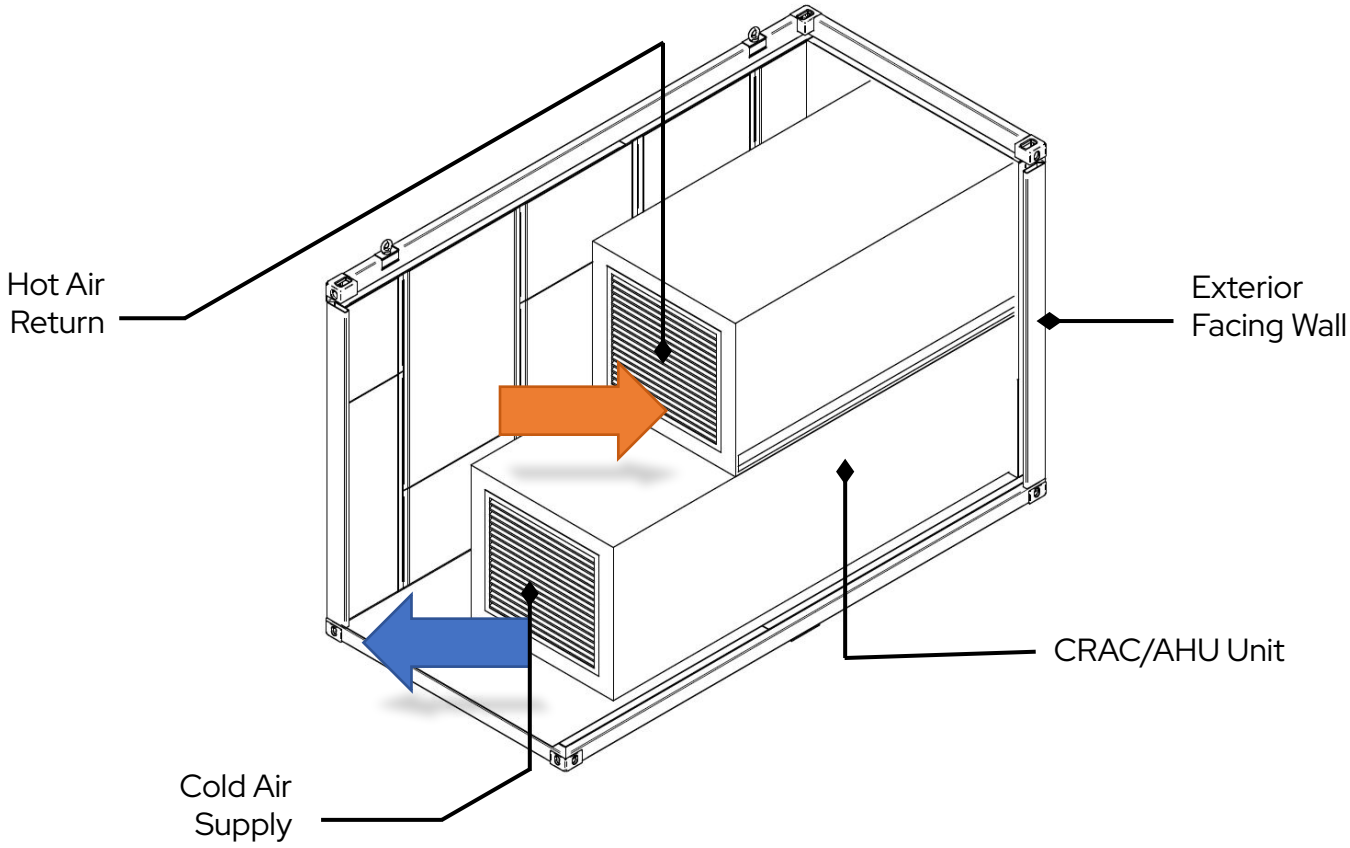
DX Cooling Pod

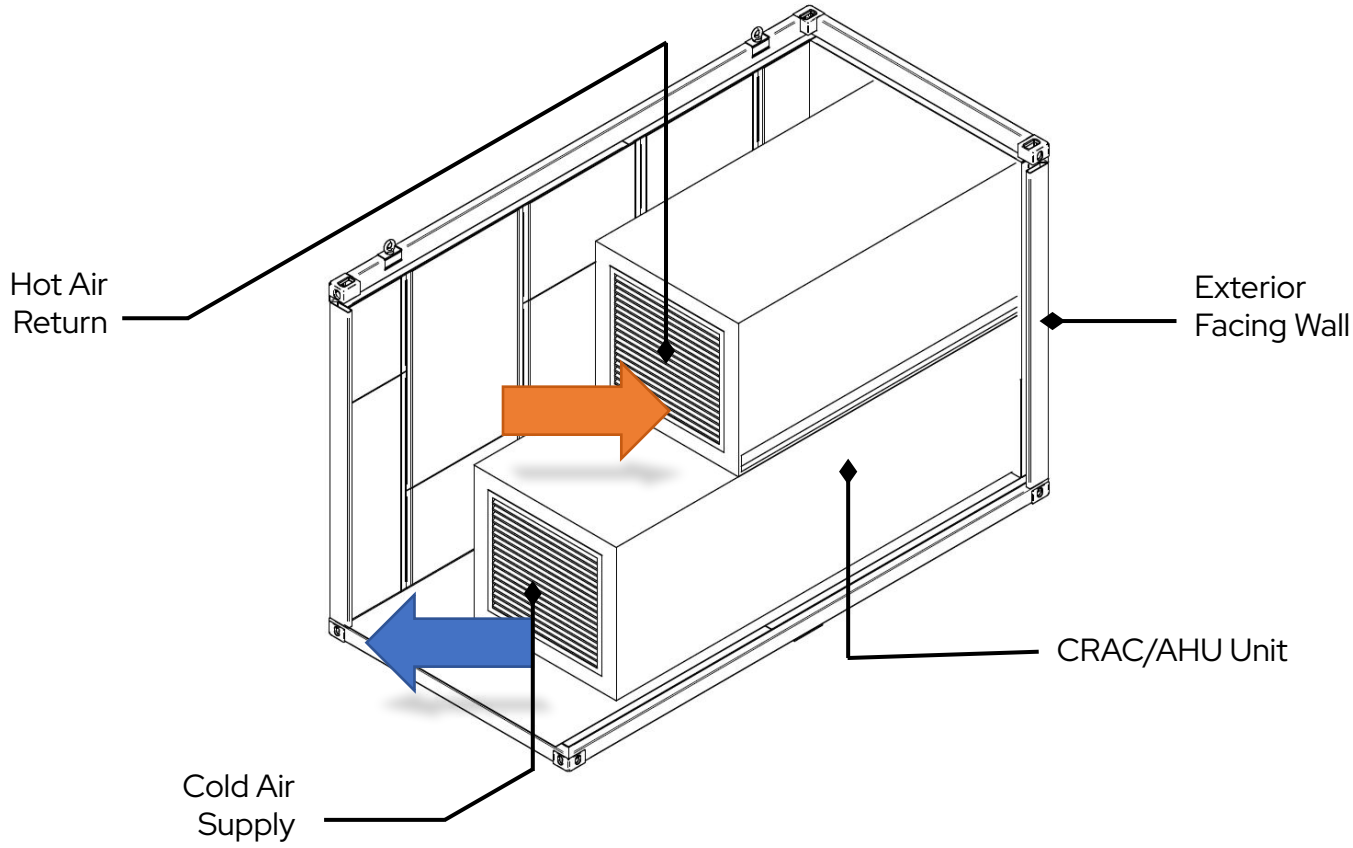
- No raised floor design
- Standard: DX CRAC units
- Option: DX/DFC AHUs (better PUE)



ALTRON MODULAR

CW Cooling Pod

- No raised floor design
- Standard: DX CRAC units
- Option: DX/DFC AHUs (better PUE)



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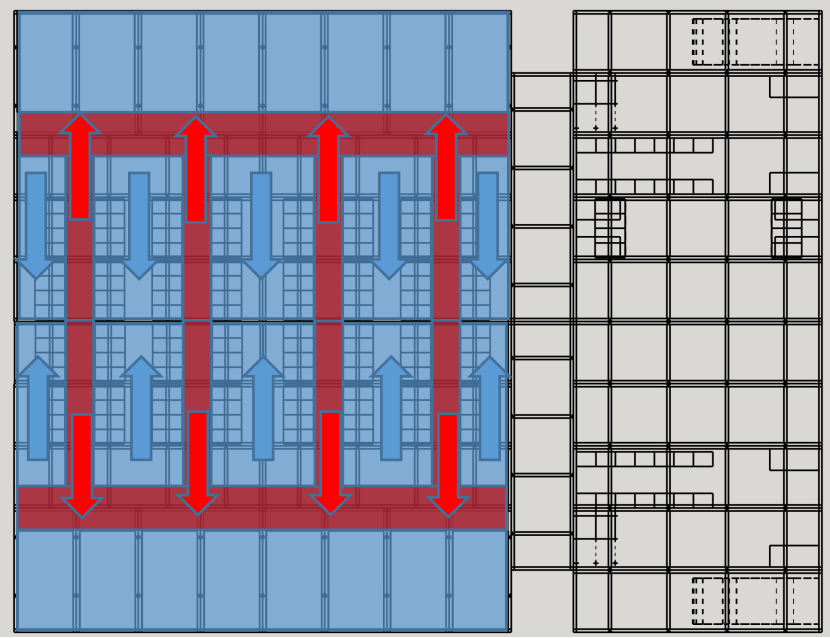
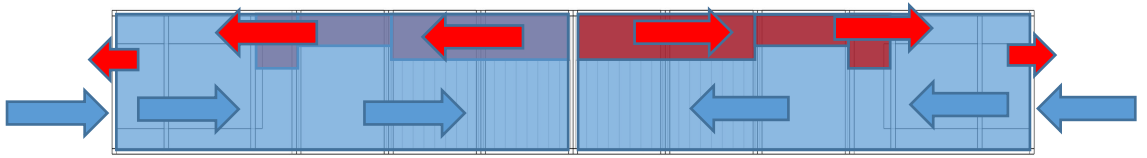
Hot Aisle Containment



- Cold air supplied from CRAC units into whitespace
- Hot air return via ceiling-mount air duct system



06

Admin Modules

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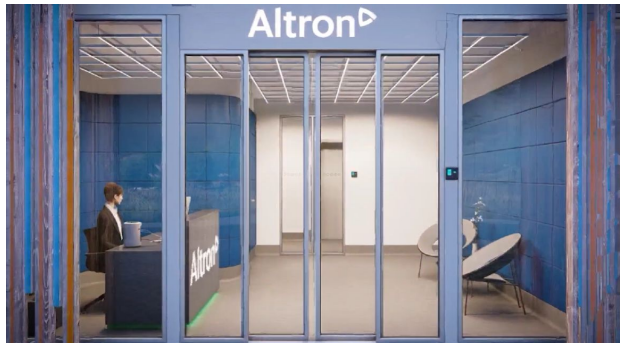
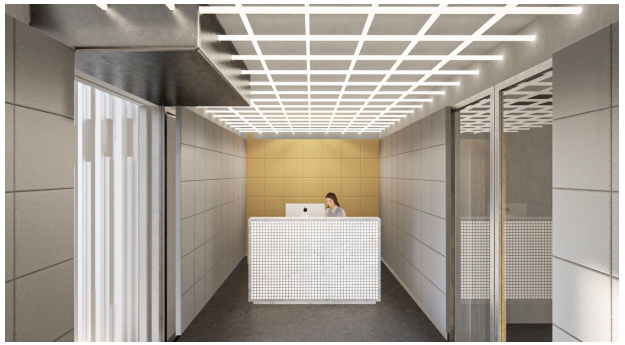
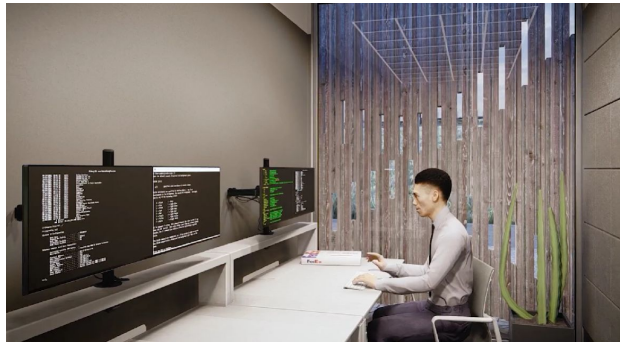
Admin Sections

- Meet Me Room (MMR)
- Staging and testing
- Storage
- Washroom
- Meeting Room
- NOC
- Reception or Security
- Prayer





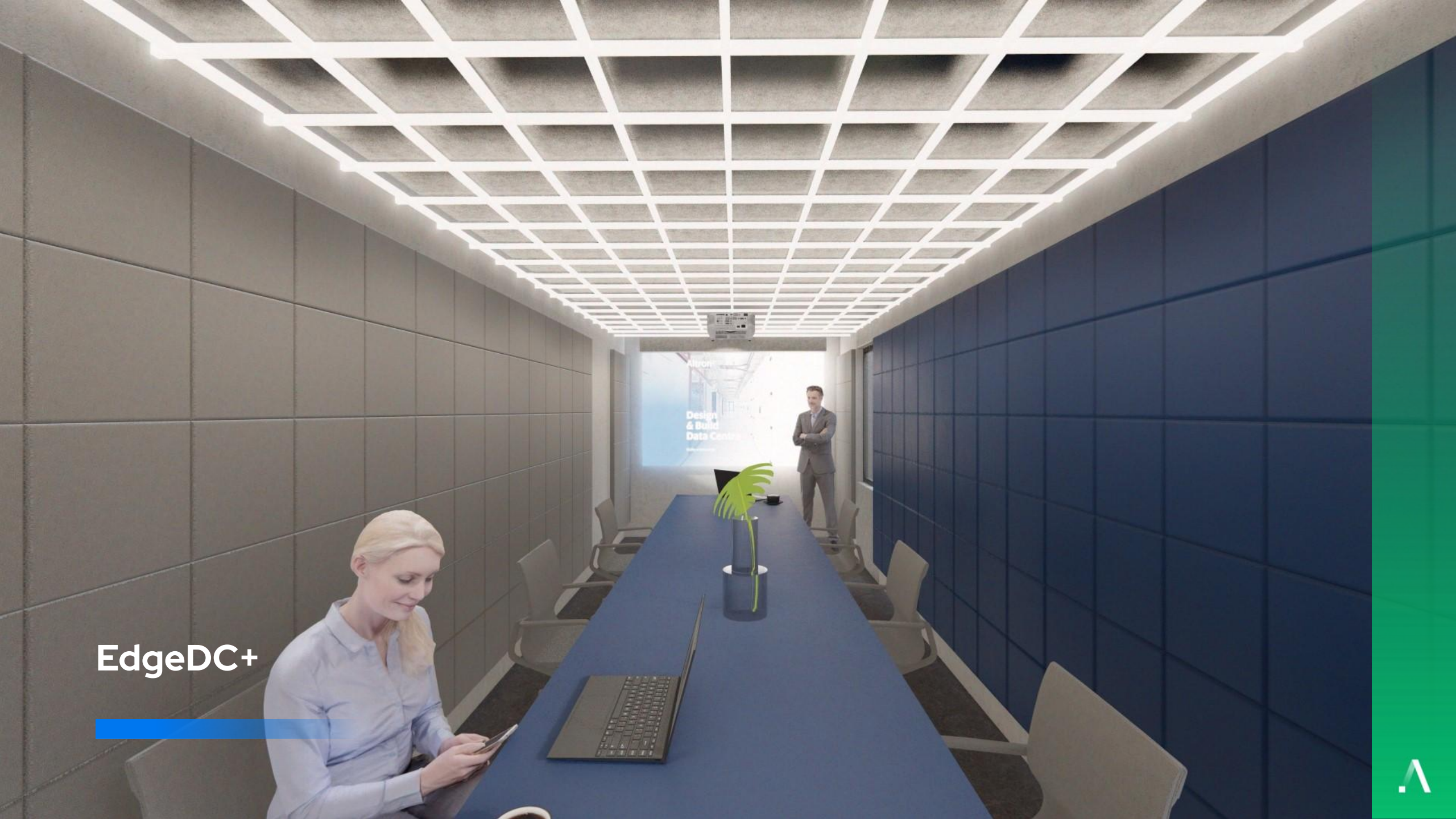


Overall recommendation to provision only for bear minimum in order to segregate industrial real estate from traditional construction projects.


EdgeDC+

EdgeDC+

EdgeDC+



EdgeDC+

07

Smart Software

SMART

Smart Services

One of the ways to **decrease operating costs and increase efficiency is through converged operations**. The principle of convergence is the transition from the management of individual systems and subsystems to the management of one integrated unit, which allows for assisted and/or autonomous operation.

Stemming from our 30-year industry experience we have Altrix monitoring and management system with following modules:

- **Real-time monitoring**
- **Control & automation**
- **Analytic services: predictive maintenance**
- **Operations optimization**

Altrix

System structure - Modules

Expert
Modular system

Altrix

Real-Time Monitoring
Data Collection and Evaluation

Control & Automation
Parameters | Profiles | Processes

Analytic services
Predictive Maintenance

Manager's portal
Clear dashboard for managers

Operations Optimization
Cost & staff effective operation

Operator's portal
Operator interface

Altrix

System structure - Modules

Real-Time Monitoring

Data Collection and Evaluation

Collects and evaluate data for Altrix downstream services

include historian data

Always provides a real-time overview

on the status and utilization of the monitored

infrastructure

Configurable architecture based on predefined templates

Continues evaluation of data availability and quality

Long term data consistency guarantee

Altrix

System structure - Modules

Control & Automation

Parameters | Profiles | Processes

Predefined parameters, profiles and operation processes for:

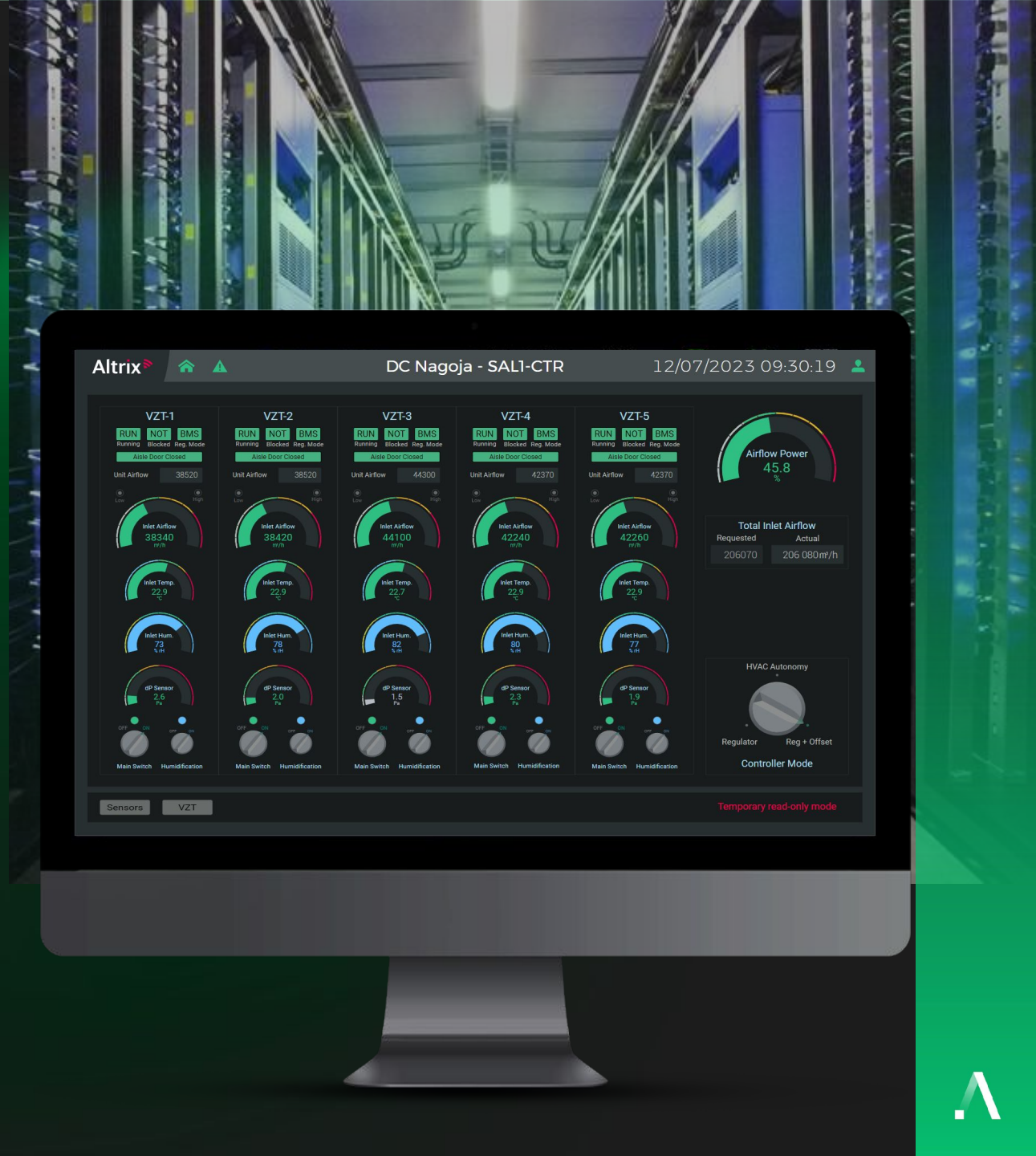
- Troubleshooting
- Change in operating conditions
- Testing procedures

Controlling the data room environment conditions

Controlled technologies (typically, not only):

- Power generation and distribution systems
- HVAC systems
- Fuel management
- Technological water treatment and distribution systems
- Heat recovery systems
- Heating systems

Power management include renewable power sources



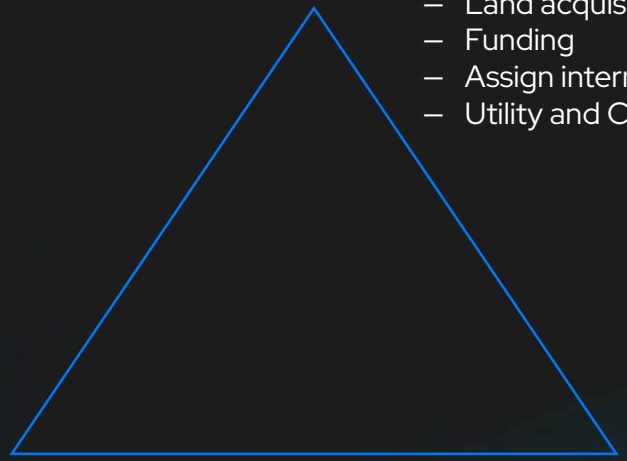
08

Services

Project Delivery

Client

- Land acquisition
- Funding
- Assign internal Resources
- Utility and Connectivity



Contractor

- Contractual liability
- Local site works
- Design localization
- Grey Space

ALTRON MODULAR

- Project technical liability
- Design & Standards
- Production
- White Space

ALTRON MODULAR

Engineering Services

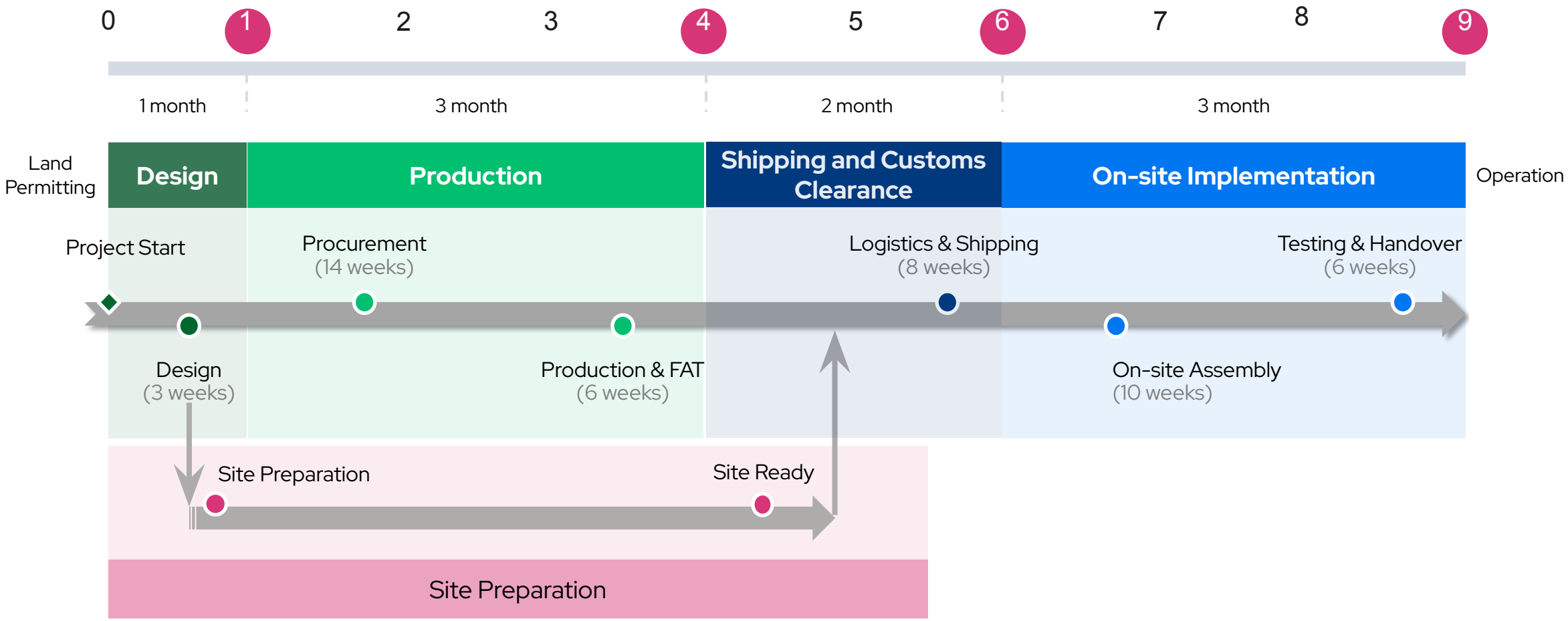
Plan, design, implement, Cx, support, and manage a modular data centre that meets your needs without any risk.

Listening to our clients, understanding their specific needs, and matching these needs with our best practices and the applicable international standards.

Benefits

- Local support services availability, delivered by global support team.
- Our services support only Altron Modular products.
- Expertise at large, with 30 years of experience in the industry.

Project Schedule



*Timeline demonstrates a scenario applicable in Kingdom of Saudi Arabia

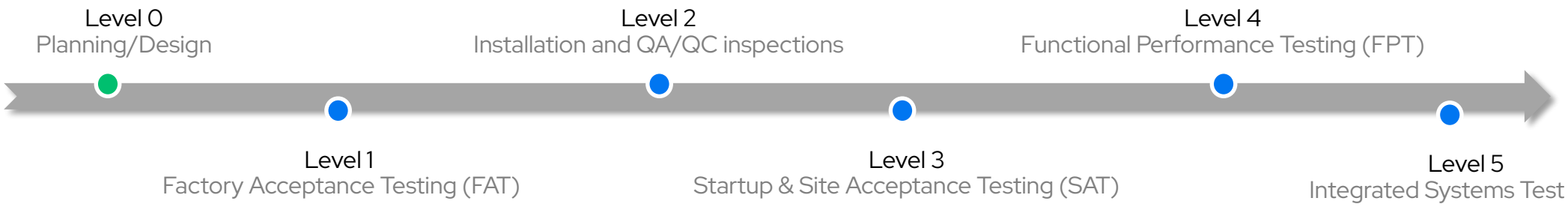
ALTRON MODULAR

Testing & Commissioning

Process goals

- Witness testing of selected components at the manufacturer's facility.
- Monitor critical equipment delivery according to the design documentation and document status of each component after unpacking.
- Document that equipment is installed according to the design documentation and started per manufacturer's recommendations.
- Document that equipment and systems receive complete operational checkout by installing contractors.
- Perform and document individual performance with thorough functional performance testing.
- Perform and document the whole system performance with thorough integrated performance testing.

Process Phases



ALTRON MODULAR

Support & Maintenance

- Global
- Regional
- Local

Managing complex infrastructure, preventing costly downtime, and ensuring 24/7 availability is our mission.

Employ "Altron Best Practices" derived from our extensive experience, technical expertise, industry practices, regulatory standards, and sound working partnerships with brands.

- Annual Maintenance Contracts
- Preventive & Reactive Maintenance
- Spare parts and Spare part management
- One-off Maintenance
- Critical Facility Management
- Altrix software
- Call-center

ALTRON MODULAR

Sustainability

is at the core of Altron Modular DNA.

Our goal is to provide our customers with eco-friendly, efficient, and cost-effective data center solutions. Additionally, our research and development team is constantly innovating to develop new technologies that will help future-proof your data center while minimizing your environmental impact.

Our approach

- **Green Power Sources**
  ready for connection of all renewable power sources.
- **Waste Heat Reuse**
  recuperation of heat produced by data center can be used, not wasted.
- **Converge Operation**
  real-time optimization of data center operation.

09

References

ALTRON MODULAR

EdgeDC+ deployed for 4G

Cloud and Colocation Provider – Salalah, Oman

Problem:

support 4G network roll-out with a deployment of modular DC
in the most deserted area of Oman.

Solution:

Highly reliable, available and secure operation of the datacentre.
Intelligent prefabricated modular system enables simple expansion.
Full 24 months of warranty for the datacentre.

Results:

- Quality solution in extreme weather conditions
- Low operation cost, thanks to energy efficiency and online monitoring.
- Redundancy – N+1 in M&E infrastructure.
- Topology – Uptime Institute TIER III.

Product:	**EdgeDC+**
Location:	**Salalah, Oman**
Delivery:	**4,5 months**
TELCO Load:	**200 kW** **scalable to 400 kW**
Number of racks:	**50**
Availability:	**TIER III**

EdgeDC+

Thank you!

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ACCELERATING DATA CENTERS' RETURNS SINCE 1991

ALTRON
MODULAR