

# Case Study

## **Dortmund Stadium, Germany**

**Case Study for a 4T4R application  
with OpenRAN**







# Empowering Industries



SOLiD provides tailored connectivity solutions that enhance operations and communication, enabling industries to thrive in today's connected world.



# Dortmund Stadium

- Signal Iduna Park, Dortmund, Germany the famous home of the mighty Borussia Dortmund
- Largest stadium in Germany
- Hosts up to 85,000 visitors.
- Holds the European average attendance record set in the 2011-12 season with 1.37 M fans over just 17 games.
- The south bank houses the largest standing terrace in European football (capacity of 24,454) and is nicknamed "Die Gelbe Wand" (the yellow wall).





Signal Iduna Park provide a unique set of challenges when it comes to providing cutting-edge mobile connectivity.

- The stadium covers a large area and has coverage needs extending to the indoor areas as well as the seating and terraces.
- The solution has to be robust enough to support tens of thousands of users with a variety of needs from voice traffic to live streaming video.
- Interoperability – O-RAN integration between CU/DU vendor and DAS supplier





# Dortmund Stadium Solution

SOLiD provides entire 4G and 5G coverage with 30 sectors for all four German operators, using the innovative GENESIS digital DAS for highest capacity and maximum user experience.

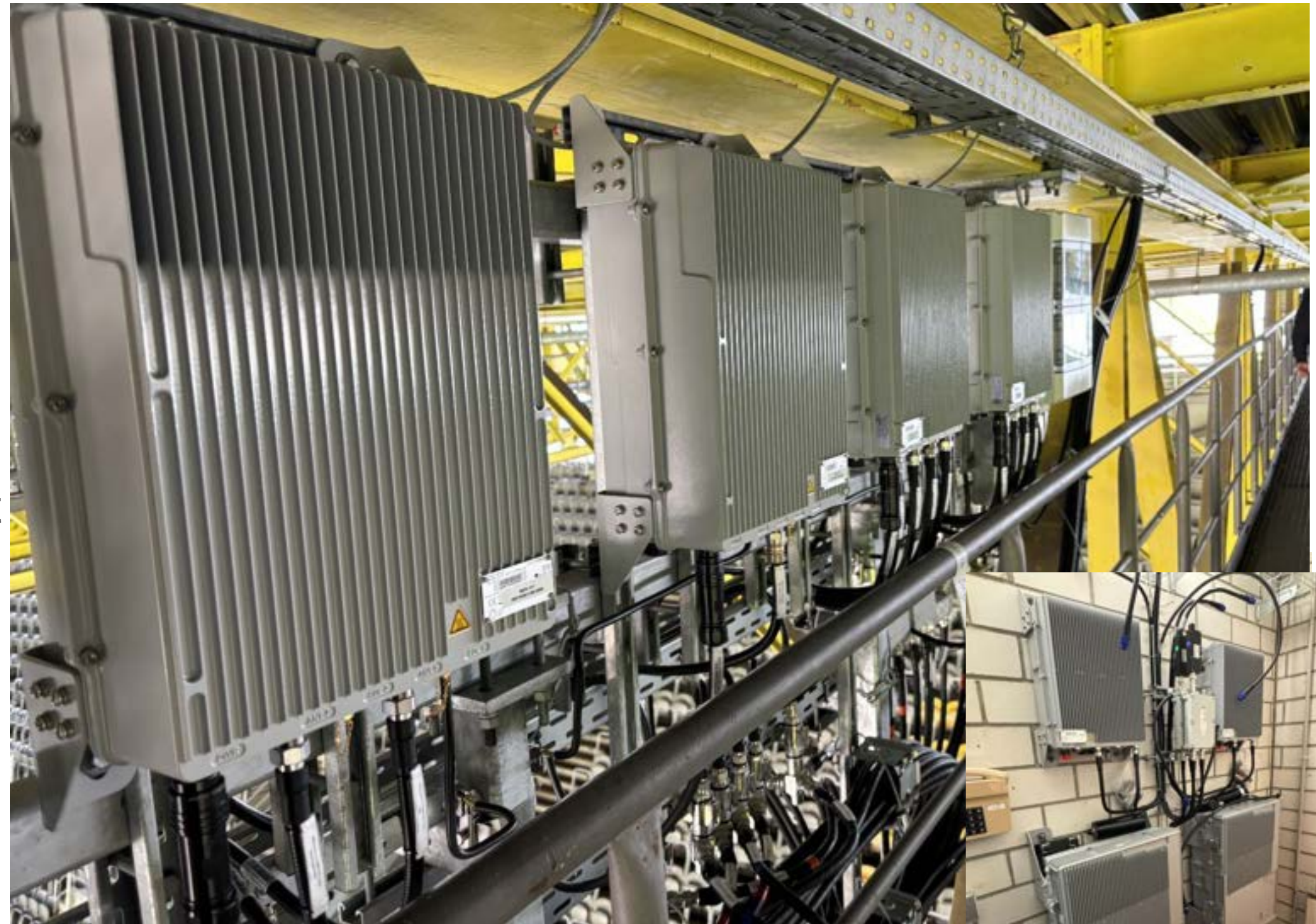
A first in Europe - SOLiD is providing OpenRAN feeding for the operator 1&1 which significantly reduces the impact on power consumption, size and weight.





# Solution - GENESIS DAS

- Fully digital multi-operator DAS
- 900, 1800, 2100 and 2600MHz for 4G plus full band n78 4T4R
- All 4 operators share the system
- Slim size radio units with optimised power consumption & power-saving function
- Depending on the application three different power classes are used:
  - low power: for high capacity indoor and VIP lounges
  - Medium power: for the bowl
  - High power: for lower capacity indoor and parking lot
- More than 150 radio units in total

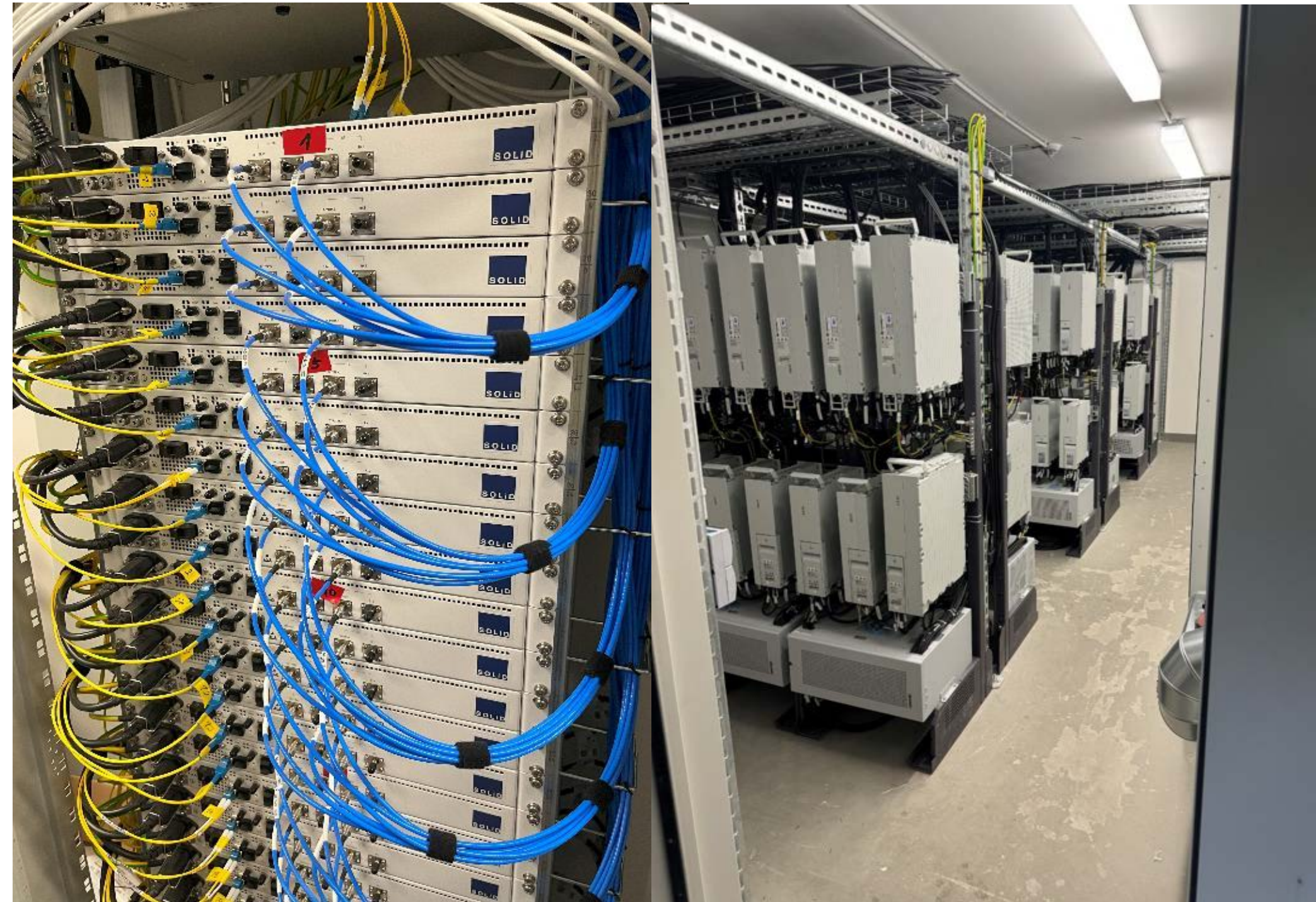






# Solution - OpenRAN

- For one operator SOLiD is supplying OpenRAN feeding using the SOLiD DIU, connected to a Rakuten CU/DU
- 30 sectors for 4G and 5G
- Minimum footprint with a single 19" rack for each technology for 1&1
- Other MNOs – dedicated MER per MNO each with 16 racks
- Highly reduced power consumption
  - Less than 2.5kW per technology for 1&1
  - Versus c. 35kW for other MNOs





# Solution - OpenRAN

- 30 network sectors within the stands
- 4 sectors in the indoor areas
- 2 sectors serving the north and west entrance & parking areas of the stadium.
- In the stands, the network consists of 48 radio units and 128 antennas with a further 60 radio units for 4G and 5G coverage and 21 antennas in the indoor areas.
- 10km of fibre optic cable and another 30km of cable to provide optimal performance.



**This provides outstanding connectivity not only for 1&1 customers but also for those on other networks.**



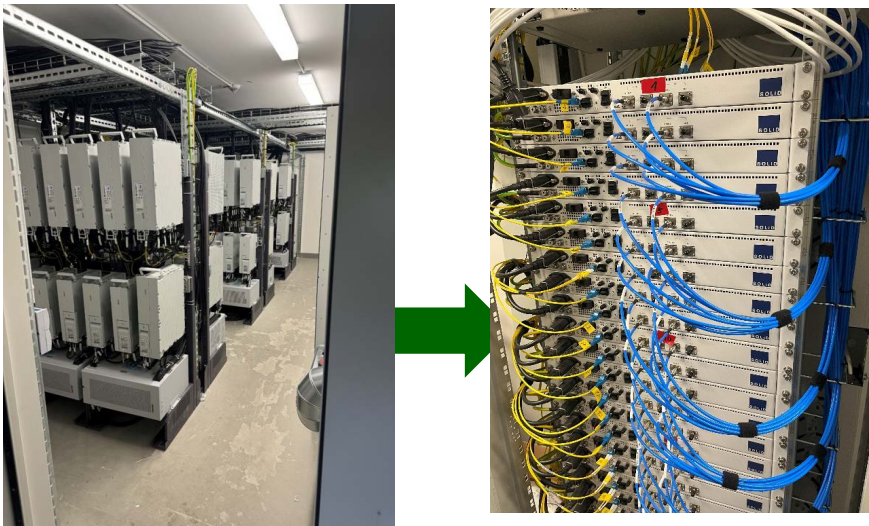
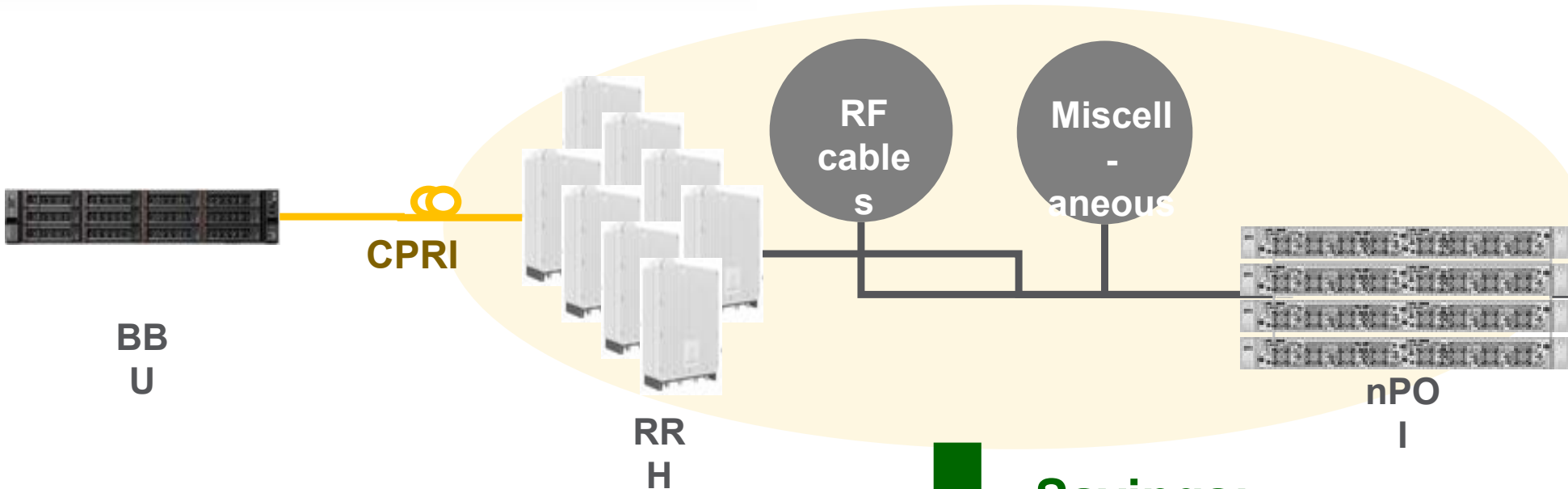


# Results - SOLiD DASource® - Why use ORAN?

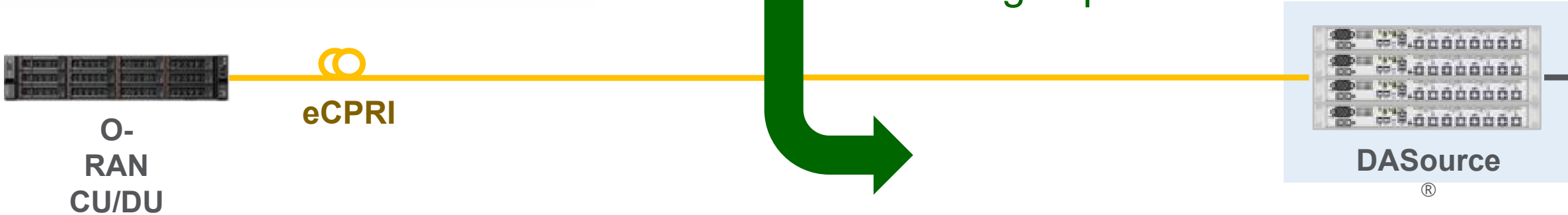


Future-proof – Sustainable – Interoperable – Total Cost of Ownership - Scalable

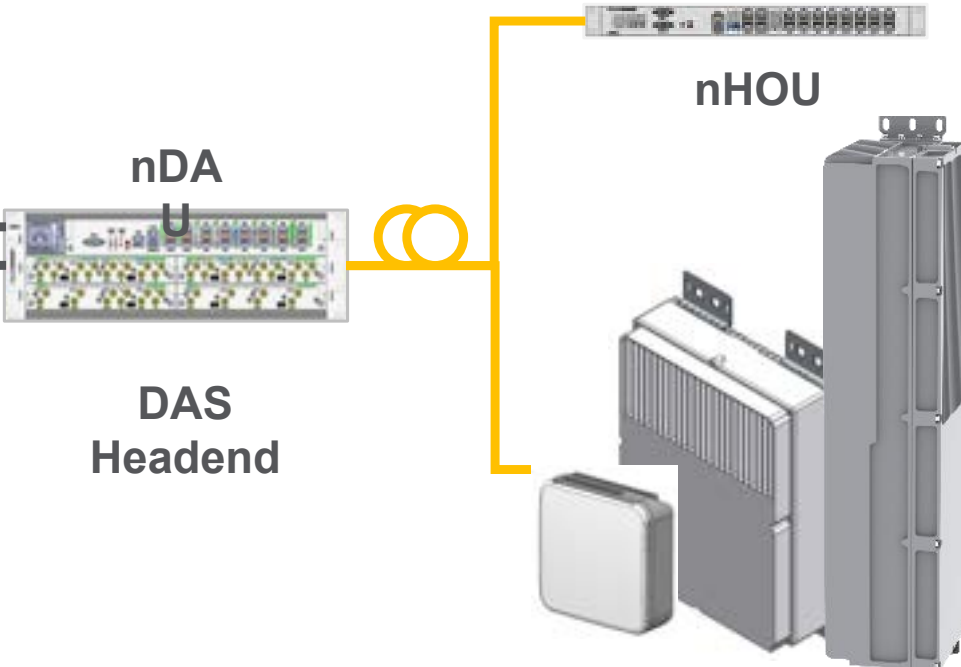
Existing solution;  
BBU + **RRH + RF Cable + nPOI + nDAU**



DASource® ;  
O-RAN CU/DU + **DASource® + nDAU**



- Savings:**
- 81% Power Consumption
  - 89% Space
  - Cooling expense



SOLiD.com/us/  
**Radio Nodes**



# The Team







Thank you

## Connecting People, Places, and Possibilities

### Certification

- ISO 9001
- ISO 14001
- ISO 45001
- ISO 27001
- ISO 22301















# Agenda









































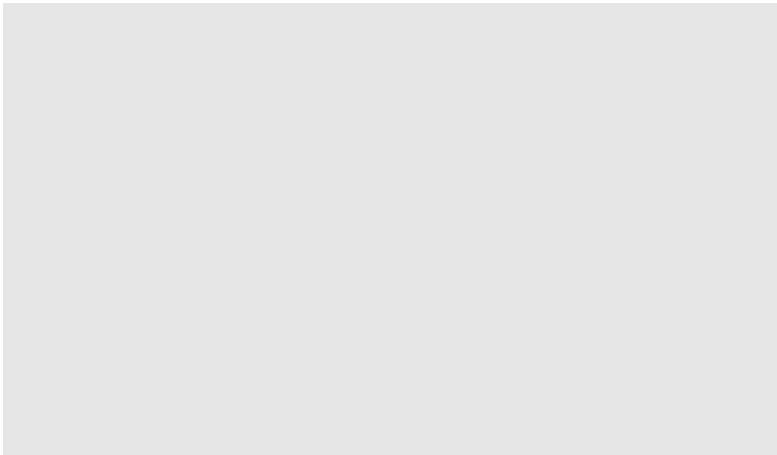
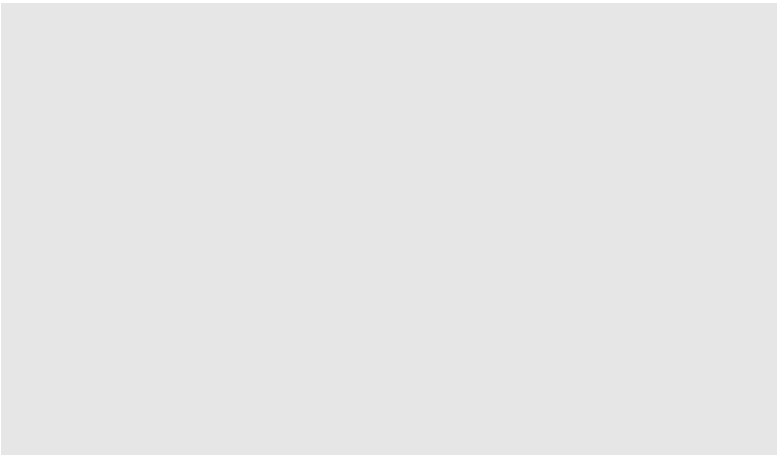
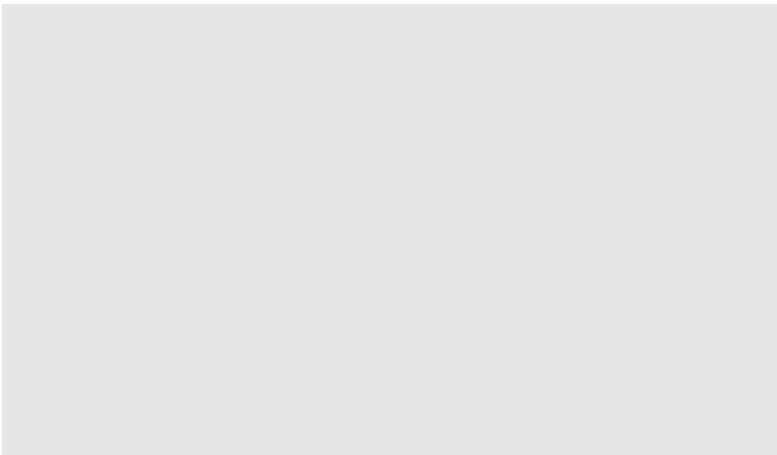
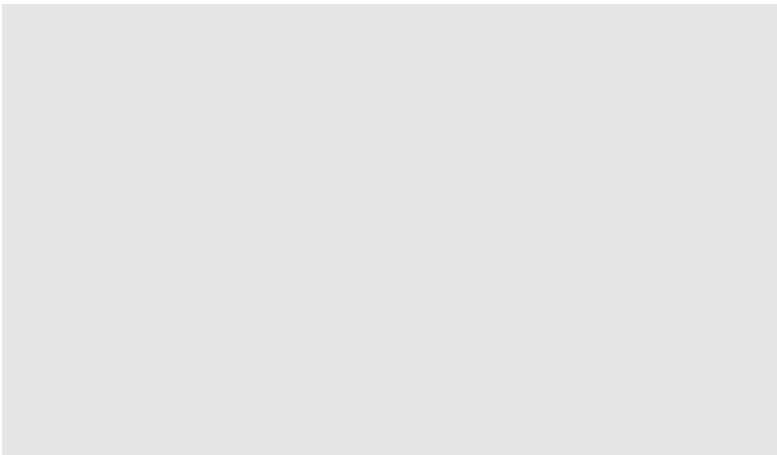
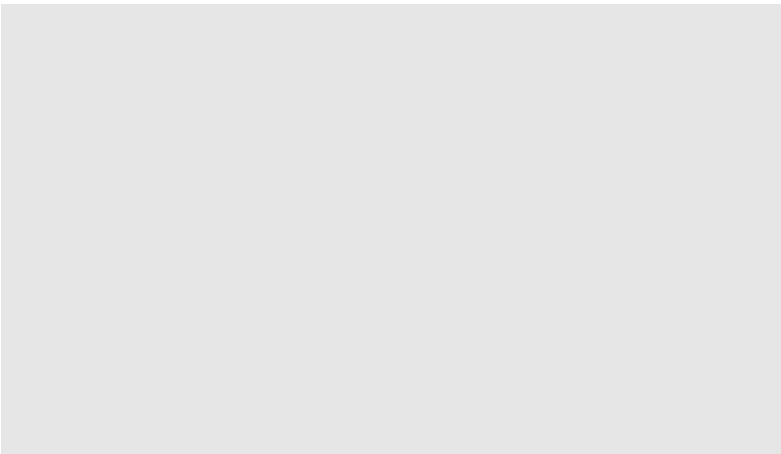
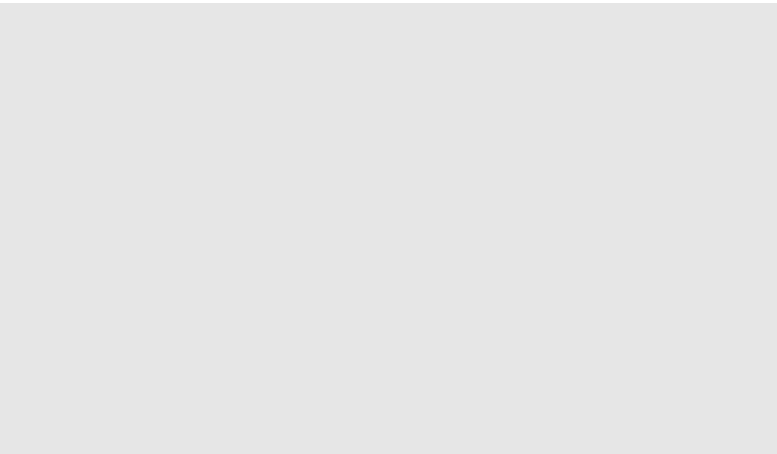












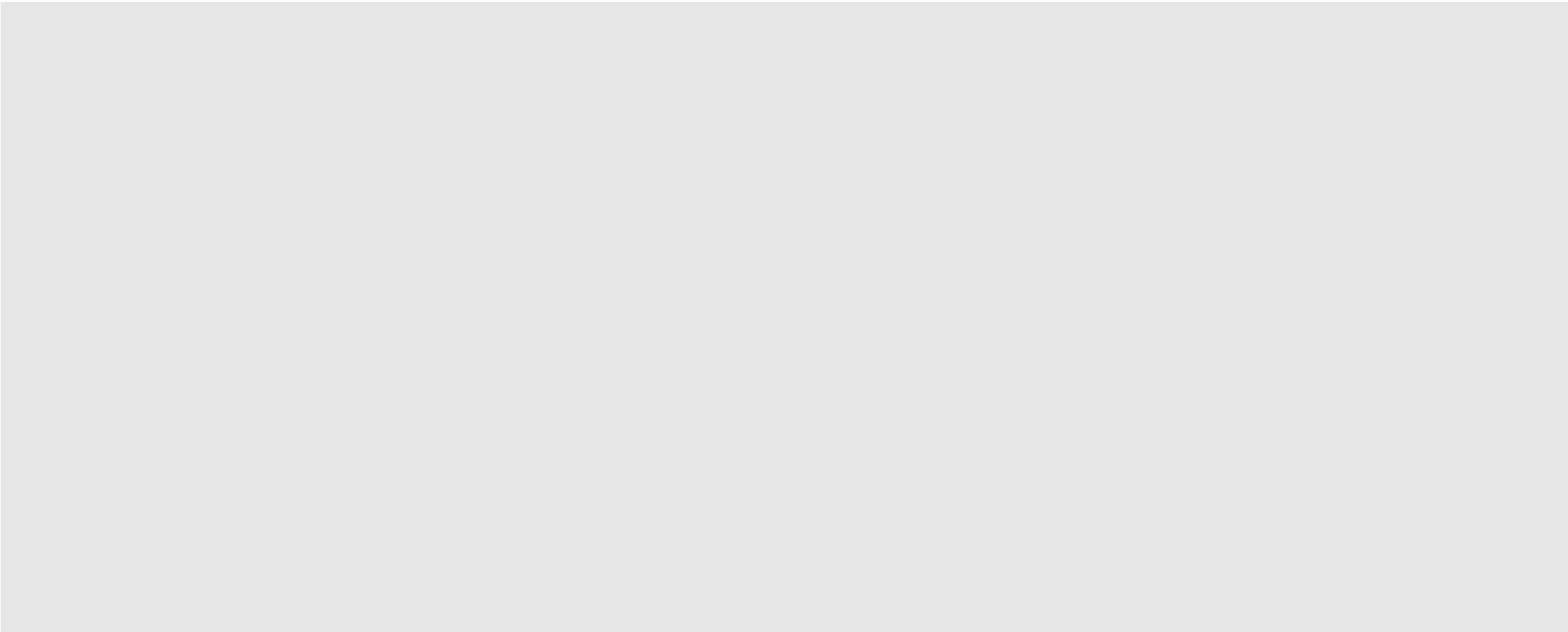
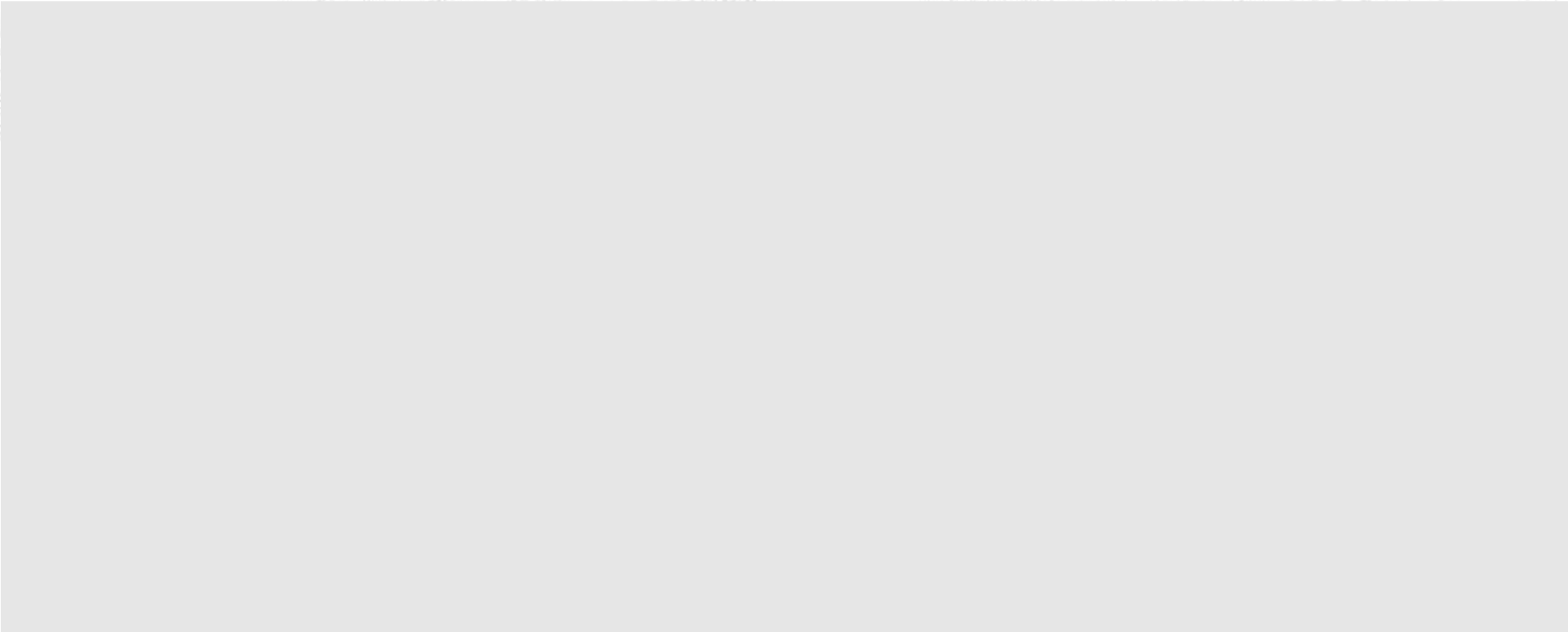
















# **SOLiD**Sustainability



# Thank You!





# Contact Us

☎ (888) 409-9997

✉ [info@solid.com](mailto:info@solid.com)

📍 800 Klein Road  
Suite 200  
Plano, TX 75074





The background of the slide is a photograph of a lush green park with several large, mature trees in the foreground and a dense line of skyscrapers in the background under a clear blue sky. A semi-transparent grey rectangle is overlaid on the left side of the image, containing the word "Backups" in blue text.

# Backups