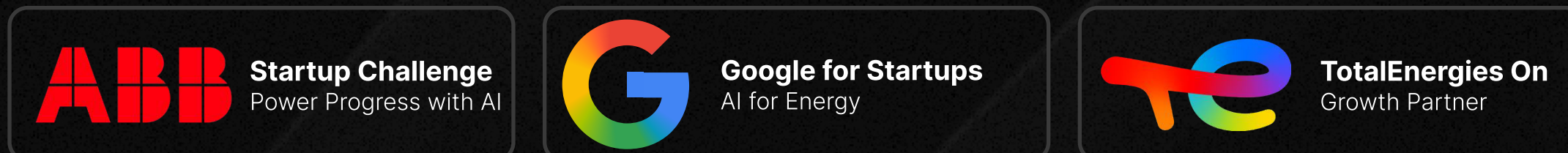




Your Grid Has Untapped Capacity.

GridSight® DLR Makes It Actionable.



info@enline.energy

www.enline.energy

Many Power Lines Carry Less Than They Safely Could.

€584 Billion

Estimated EU Grid Investment Required By 2030

The European Commission estimates €584 billion in transmission and distribution grid investment is needed across the EU by 2030.

European Commission - Action Plan for Grids (2023)

3,000 TWh

Renewable Generation Projected To Be At Risk Of Curtailment By 2030

Clean energy is being generated and curtailed, not because of insufficient generation, but because thermal ratings are set conservatively.

International Energy Agency (IEA), Electricity Grids and Secure Energy Transitions

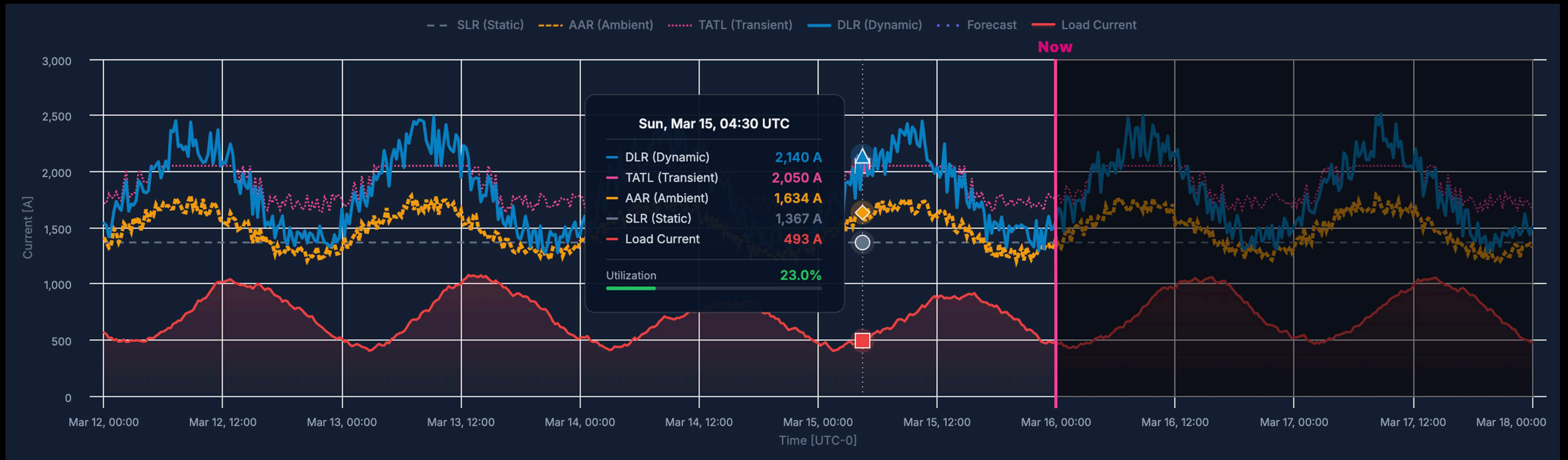
3,000 GW

Projects Currently Stalled In Interconnection Queues Globally

At least 3,000 GW of generation projects are currently awaiting grid connection globally, constrained by interconnection queue backlogs.

International Energy Agency (IEA), Electricity Grids and Secure Energy Transitions (2023/2024)

Your Congestion May Be Driven By Conservative Assumptions, Not Actual Thermal Limits.



Real example - 500kV corridor, March conditions.

GridSight® DLR

Overview

GridSight® DLR is a grid-enhancing technology (GET) that calculates real-time and forecast thermal ratings for transmission and distribution lines based on actual environmental and operational conditions. Unlike static line ratings, which apply fixed worst-case environmental assumptions, GridSight® DLR adapts continuously to real-time wind speed and direction, ambient temperature, solar radiation, and modelled conductor temperature along the full line route.

Benefits

- **Operational Headroom:** GridSight® DLR typically delivers 10–20% additional thermal capacity over static ratings on an annual average basis. Gains vary by season, line orientation, and local wind regime, and are generally highest during cooler, windier conditions.
- **Lower Entry Cost:** Deploying GridSight® DLR typically costs 5–7% of an equivalent reconductoring or line rebuild investment, based on representative project benchmarks.
- **No Outage Required:** GridSight® DLR is a 100% software-based solution. Deployment requires no line outages, field instrumentation, or live-line work. Data inputs include grid design parameters, line route geometry, and real-time SCADA feeds.



GridSight® DLR Interface

Inputs

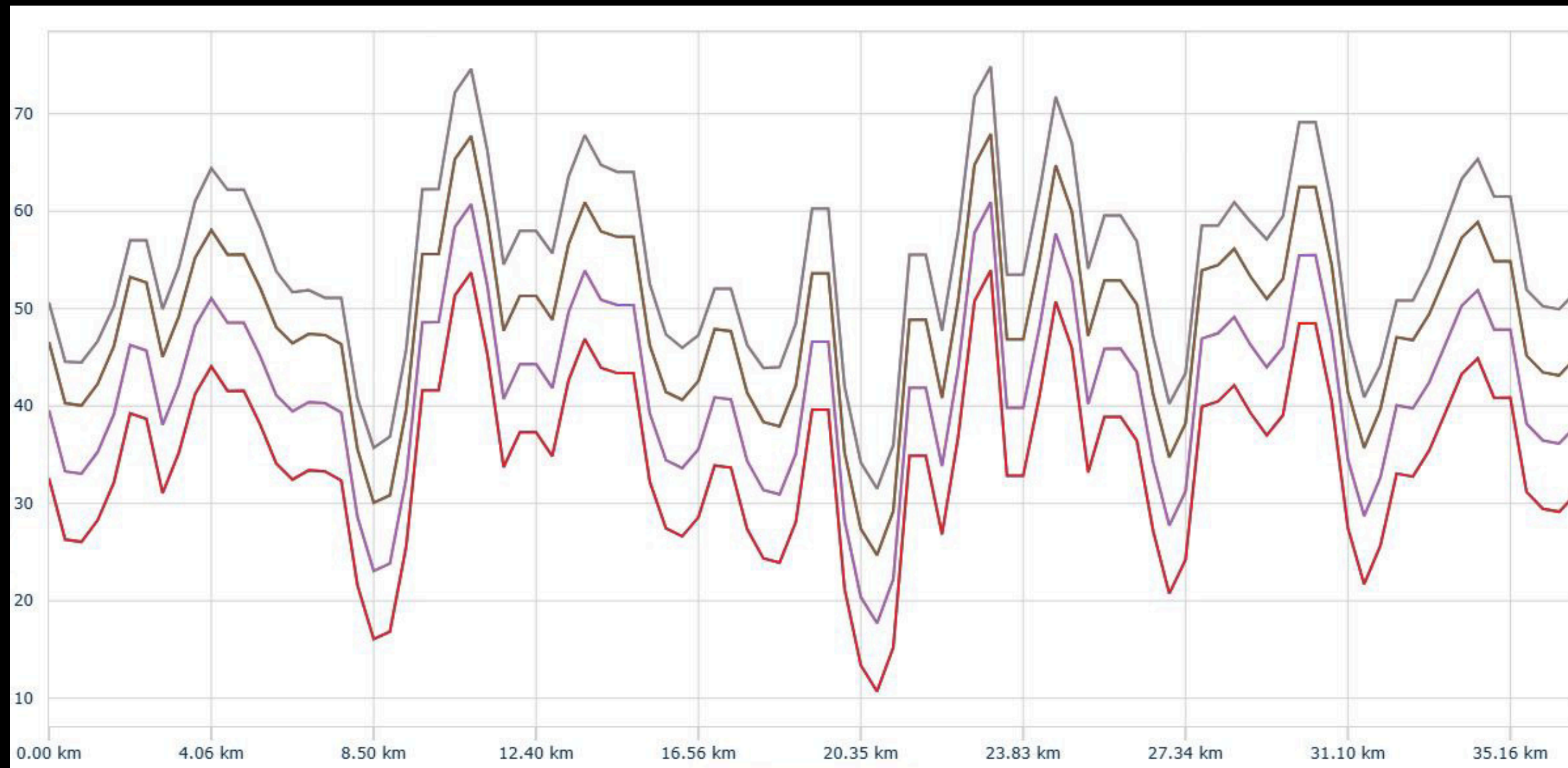
- Line Design Parameters
- Georeferenced Tower Coordinates And Line Route
- Real-Time Electrical Load Data (SCADA Or Equivalent)

Outputs

- Real-Time And Forecast Thermal Ratings (Ampacity / MVA)
- Thermal Risk Alerts And Exceedance Notifications
- Multiphysics Analysis Dashboards

Beyond Simple Thermal Ratings.

DLR calculates conductor thermal ratings. GridSight[®] ensures the additional capacity is system-safe and dispatchable.



Real-time conductor ground clearance profile across all spans, with sag and tension calculations for safety compliance verification.

Dynamic Security Assessment

Overview

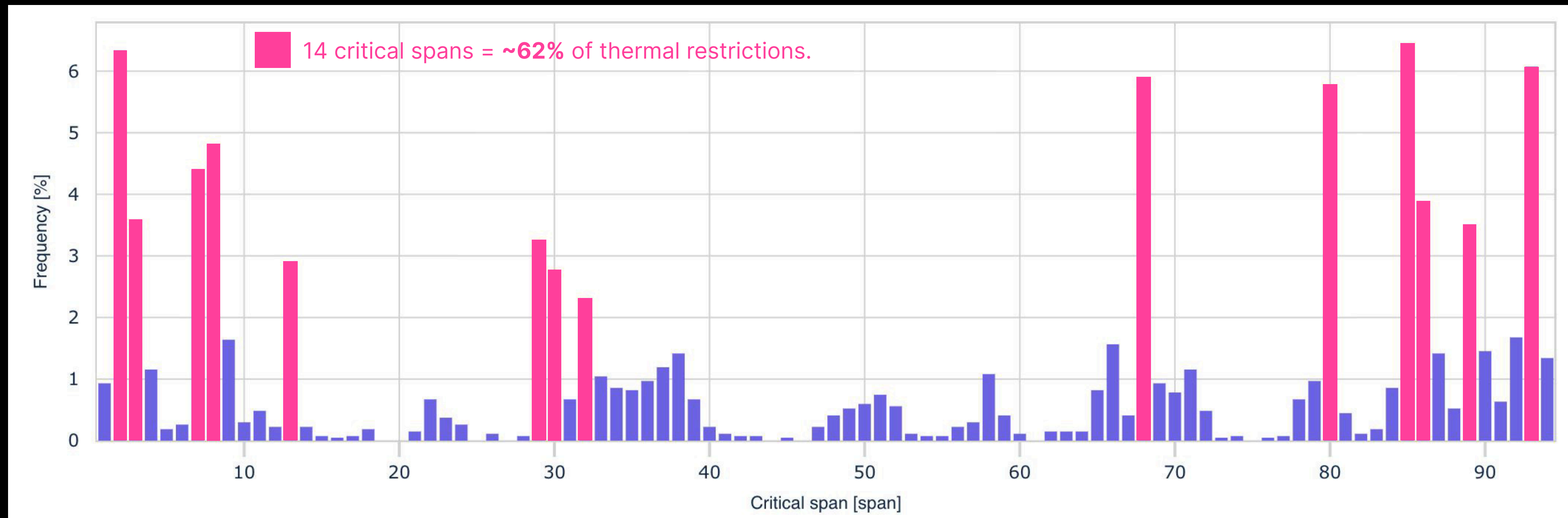
To ensure that dynamically rated capacity can be safely utilised, Enline integrates the Dynamic Security Assessment (DSA) module as standard in every GridSight[®] implementation. The DSA evaluates not just conductor thermal limits, but the operational constraints of the entire connected system.

What we deliver:

- **Series Equipment Assessment:** Verification that uprated ampacity does not exceed the continuous current ratings of series-connected equipment, including current transformers (CTs), voltage transformers (VTs), circuit breakers, and disconnectors.
- **Contingency & Security Analysis:** Real-time assessment of power flow, voltage stability, and protection coordination under elevated DLR conditions. Verifies that N-1 security criteria are maintained at all operating points, ensuring the additional capacity does not compromise system security.

Identifying The Spans That Limit Capacity.

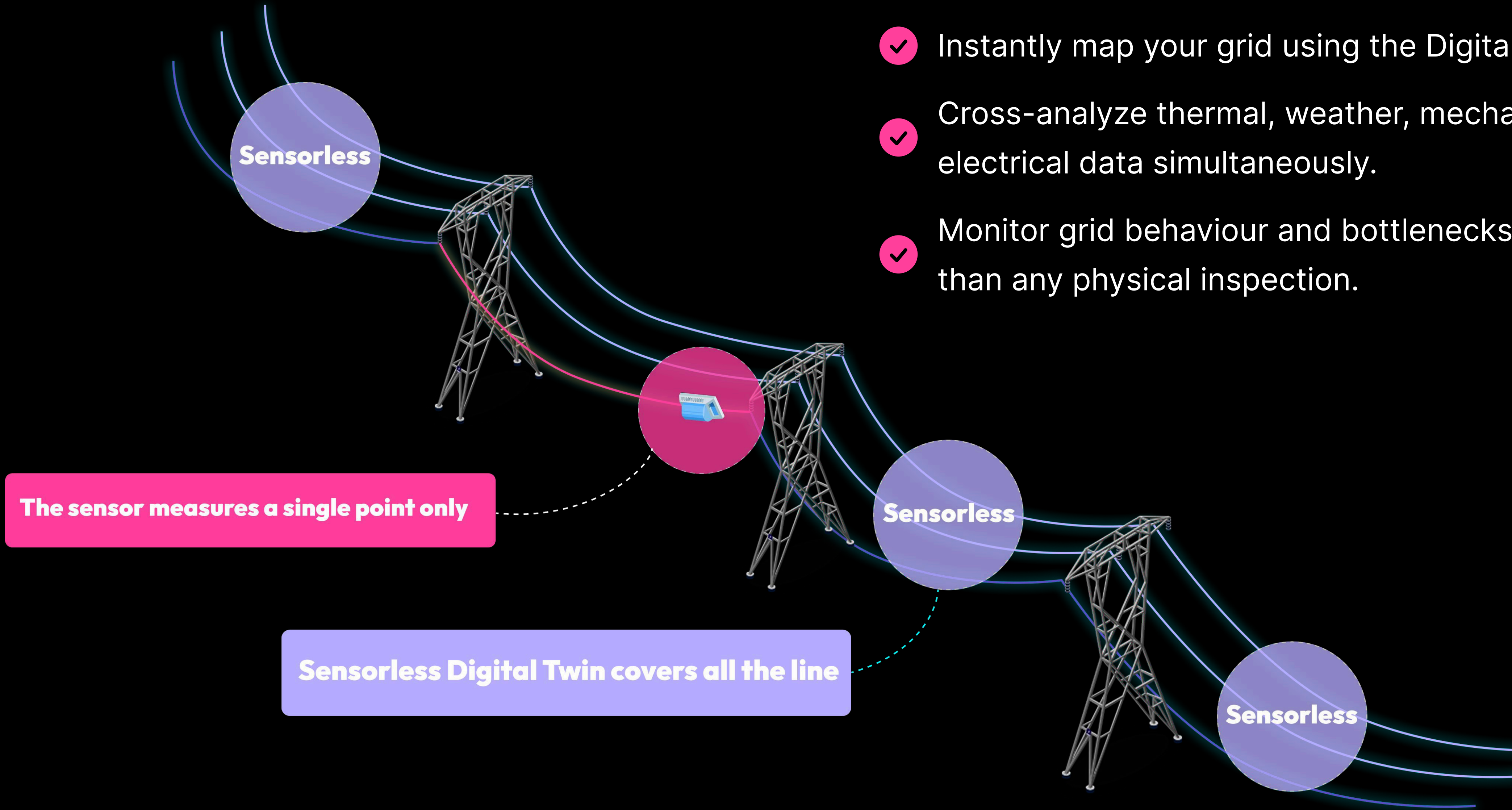
The critical span is not fixed, and often not where you expect. GridSight[®] models the entire line, revealing real-time hotspots across the network, including unseen or previously overlooked locations. Plan smarter. Deploy sensors and new lines where they actually matter.



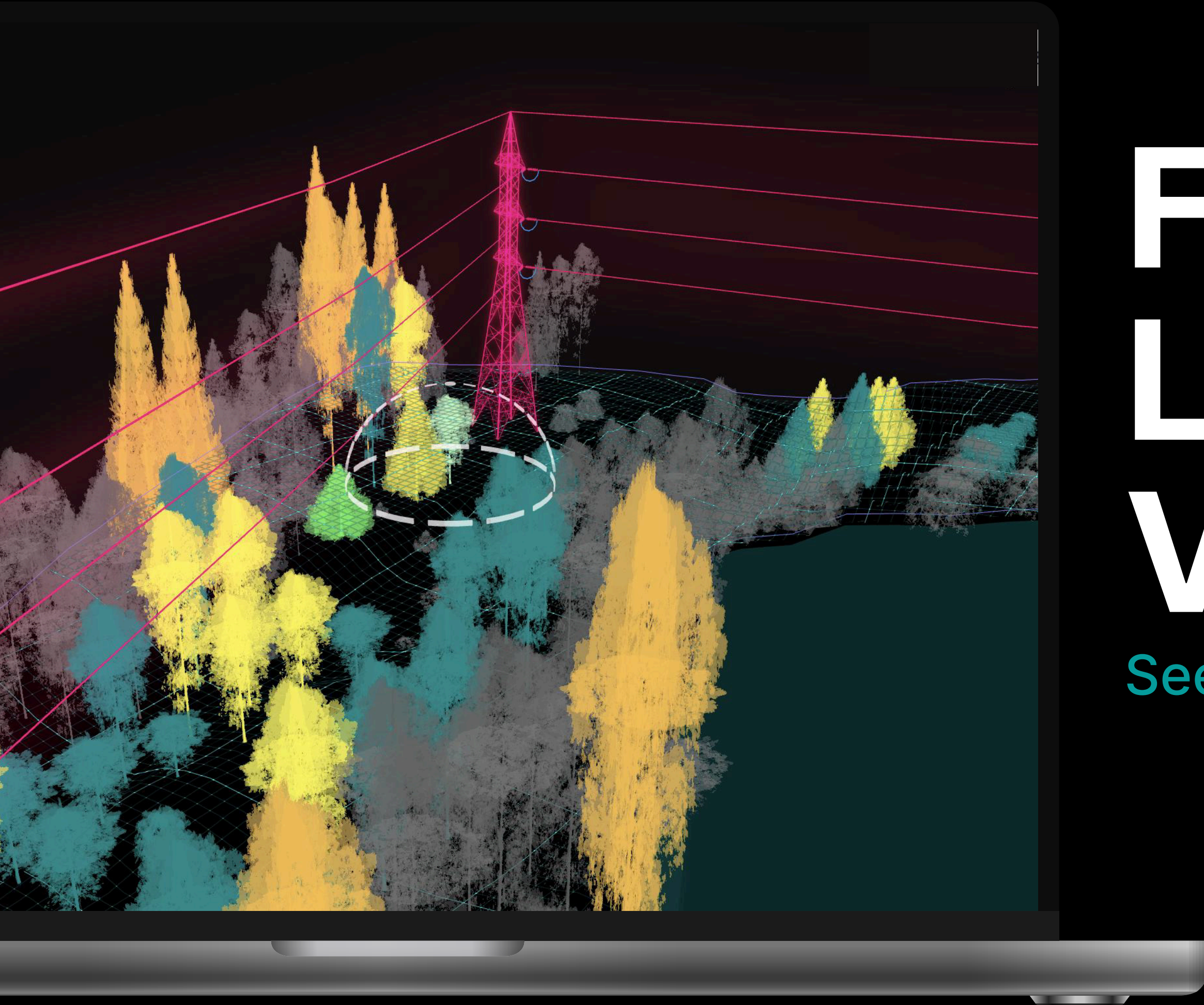
Histogram Analysis of critical span change, from 01-01-2025 to 31-12-2025 (Full Year)

GridSight® DLR Approach. More Benefits.

Capability	Sensor-Only DLR	GridSight® DLR
Real-time Data (Physics-based Thermal Model)	Only The Span Where The Sensor Is	✓ Not Just Where The Sensor Is
No Hardware Required	X Sensors Needed	✓ Sensorless Default, Sensors Are Optional
AI Forecasting (7–10 Day)	X Sensor Gives NOW, Doesn't Forecast	✓ Built-in
Integration With Other Modules	X	✓ GridSight® Modules
Stability & N-1 Analysis	X	✓ DSA Included
Time To Deploy	3–6 Months	✓ Weeks

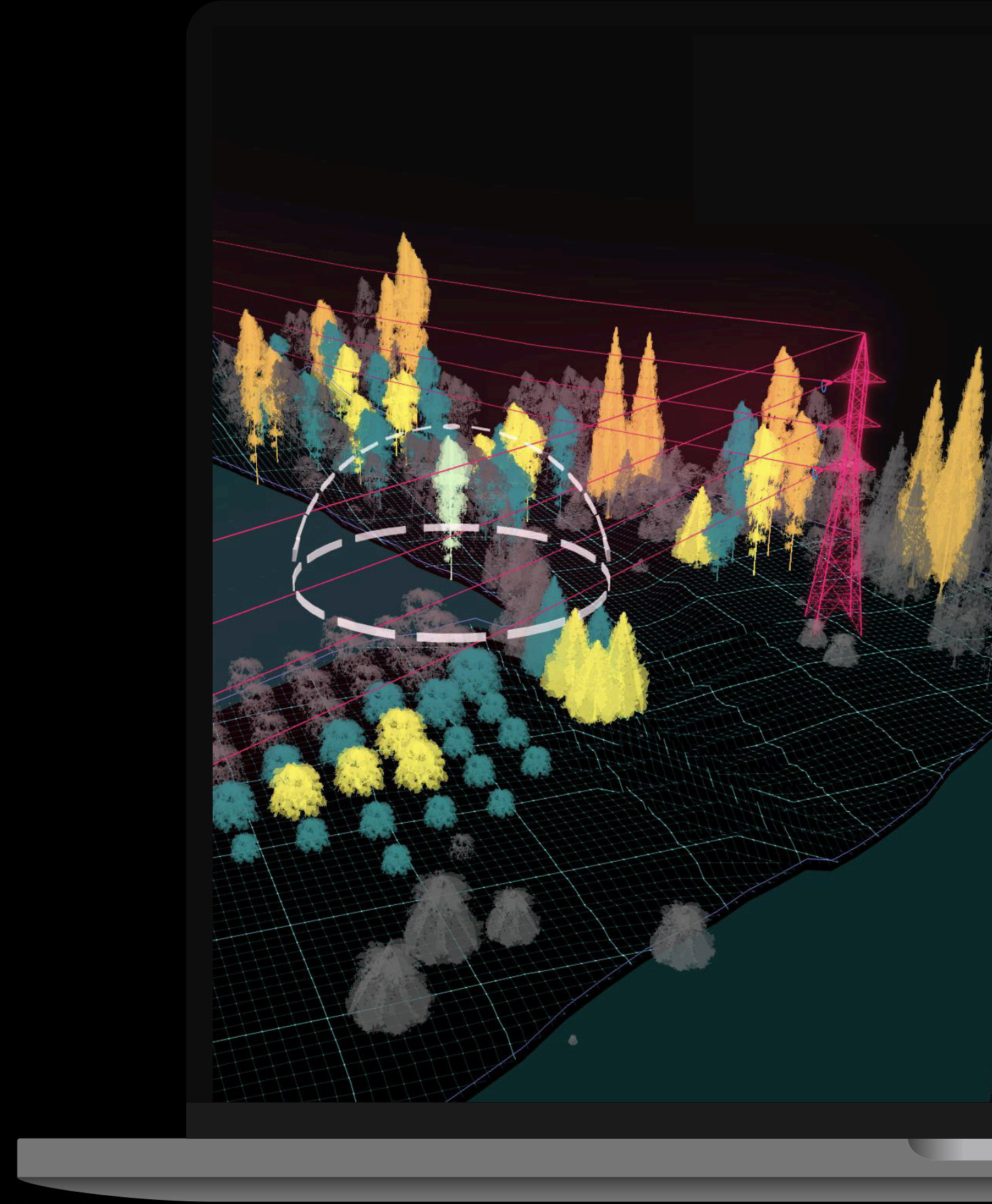


- ✓ Instantly map your grid using the Digital Twin.
- ✓ Cross-analyze thermal, weather, mechanical, and electrical data simultaneously.
- ✓ Monitor grid behaviour and bottlenecks faster than any physical inspection.



Full Line/Grid Visibility.

See All Spans. One By One.



Modelled Conductor Temperature

Continuous thermal state calculation using the heat balance method, providing accurate ampacity determination and cumulative thermal exposure tracking for annealing risk management.

Line Sag and Tension

Catenary-based calculation of conductor sag, tension, and thermal elongation under dynamic loading conditions.

Ground Clearance

Real-time calculated clearance-to-ground and clearance-to-vegetation profiles across all spans for safety compliance and wildfire risk mitigation.

Vibration Assessment

Aeolian vibration exposure estimation for fatigue life analysis and structural integrity monitoring.

Tower

Id:E-007

Type:2A30

Latitude:-10.733668°

Longitude:-75.270726°

Altitude:1543m

Obs:A-Inc. Ref., I-NRef.

Code:4ST00338

Alert:True



Physics-Based Modeling

Thermodynamic and mechanical simulation applied to a georeferenced 3D digital twin of the line route.

Real-Time Data Fusion

Integration of high-resolution numerical weather prediction (NWP) data, real-time SCADA electrical loading, and line design parameters.

GridSight® DLR National Deployment.

Enhancing Lithuania's Transmission Grid To Support Renewable Integration, Reduce Congestion, And Reinforce Energy Resilience.

>1 000 km

Transmission Lines
Monitored

Hybrid

DLR Approach

Customer:



52%

Average Capacity Gain



Read the Full Testimonial Here.

GridSight®DLR Quantified Results.

Proven Performance On A Strategic 400 KV Corridor Supporting Data Centre Load Growth And Renewable Energy Integration.

80%

Peak Capacity Uplift,
Observed During Winter
Wind Conditions

59.4 km

Strategic 400 kV
Corridor

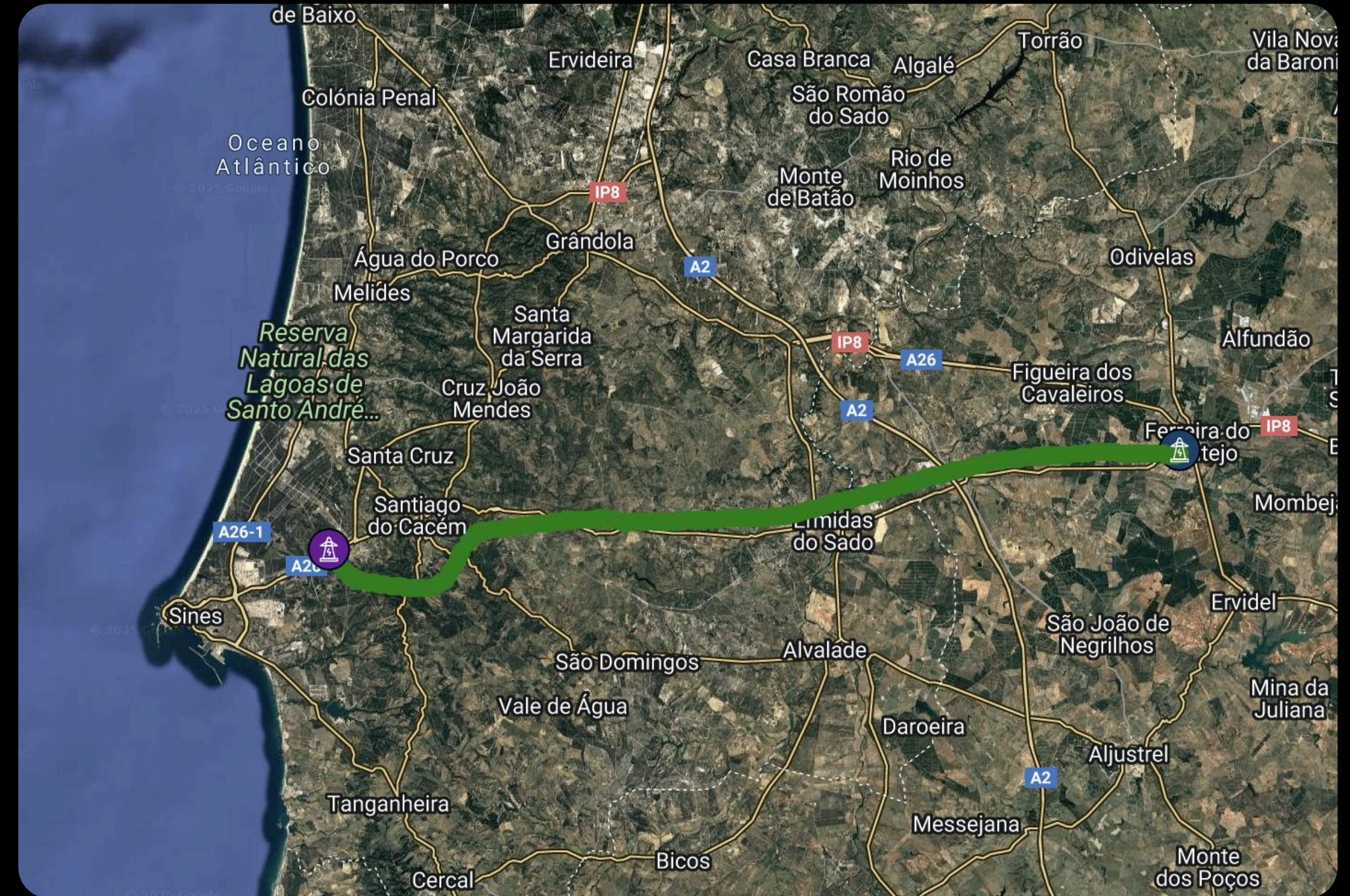
20-40%

Average Capacity Gain

Customer:



Read the Full Case Study Here.



Section monitored by GridSight® DLR and Digital Twin



GridSight®DLR Quantified Results.

Proven Performance In Corridors Defined By Curtailment And Renewables Integration.

25 %

Estimated Reduction In Renewable Curtailment

≈ 9 GWh

Additional Renewable Energy Dispatched Per Year

Customer:

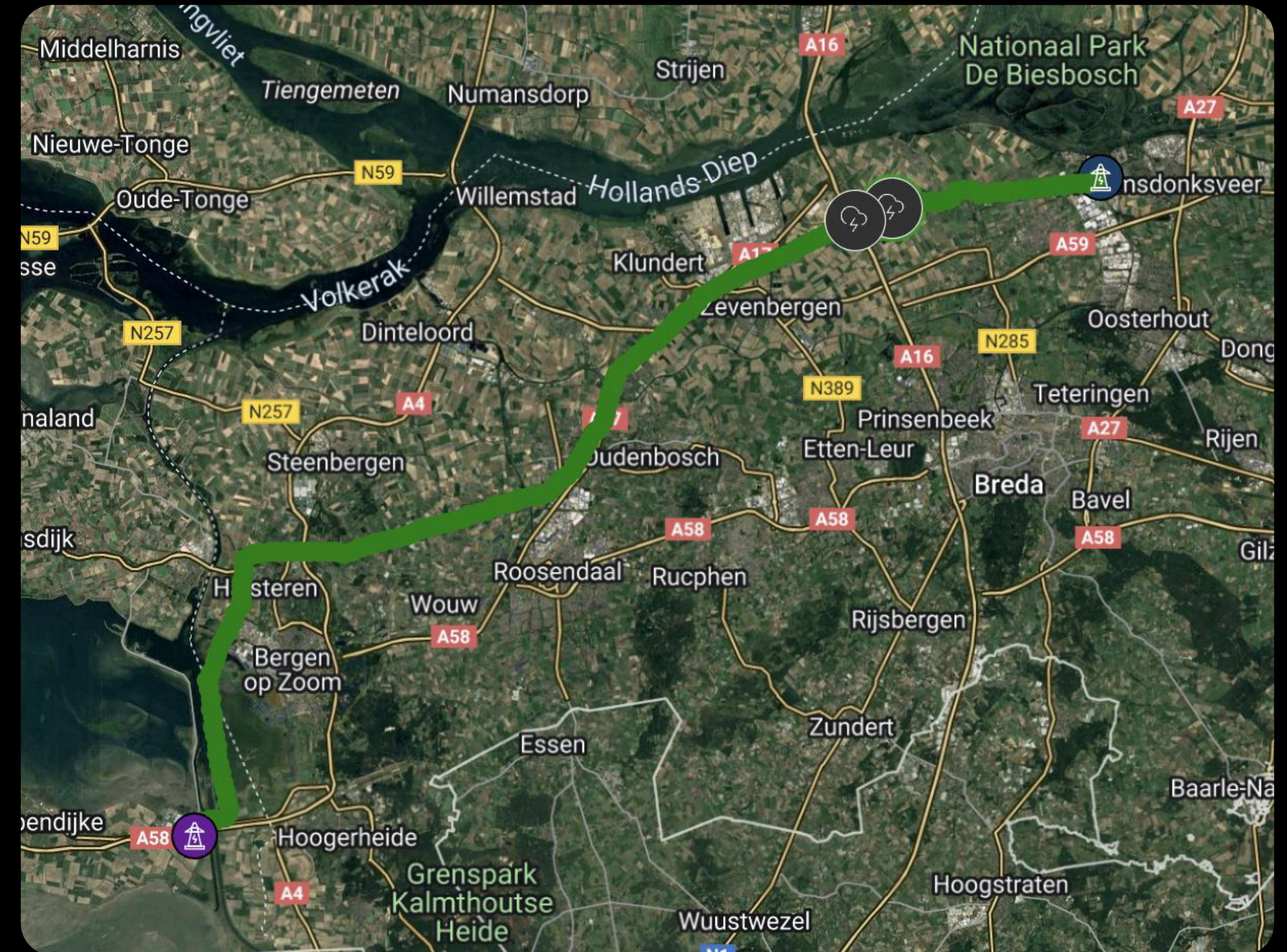


10-20%

Average Annual Thermal Rating Gain



Read the Full Case Study Here.



Section monitored by GridSight® DLR and Digital Twin



Trusted By The World's Leading Grid Operators.



Industry Veterans. Deep Power Systems Expertise.



Manuel Lemos

CEO & Co-founder

Former Director, Voith Siemens Hydro. 20+ years leading power infrastructure projects across Europe and the Americas.



Gabriel Pino

CTO & Co-founder

Former Technical Manager, Voith Siemens. Architect of real-time grid monitoring and control systems deployed across five continents.



Martin Andrae

CSO

Former Global CMO and CEO, Voith Siemens. 30 years+ of executive leadership in international power markets and large-scale industrial operations.



Duarte Fleming

CGO

Former Head of AI Product, Siemens Energy. Led commercialisation of AI-based grid analytics products across European energy markets.



João Galamba

Head of Regulatory Affairs

Former Minister of Infrastructure, Portugal. Extensive regulatory and energy policy expertise across EU frameworks.



See GridSight® DLR in Action

Book a technical demonstration with our engineering team.

→ **Book Your Demo**



 **E-mail**

info@enline.energy

 **Website**

www.enline.energy

 **Offices**

Mirandela, Portugal
Lima, Peru