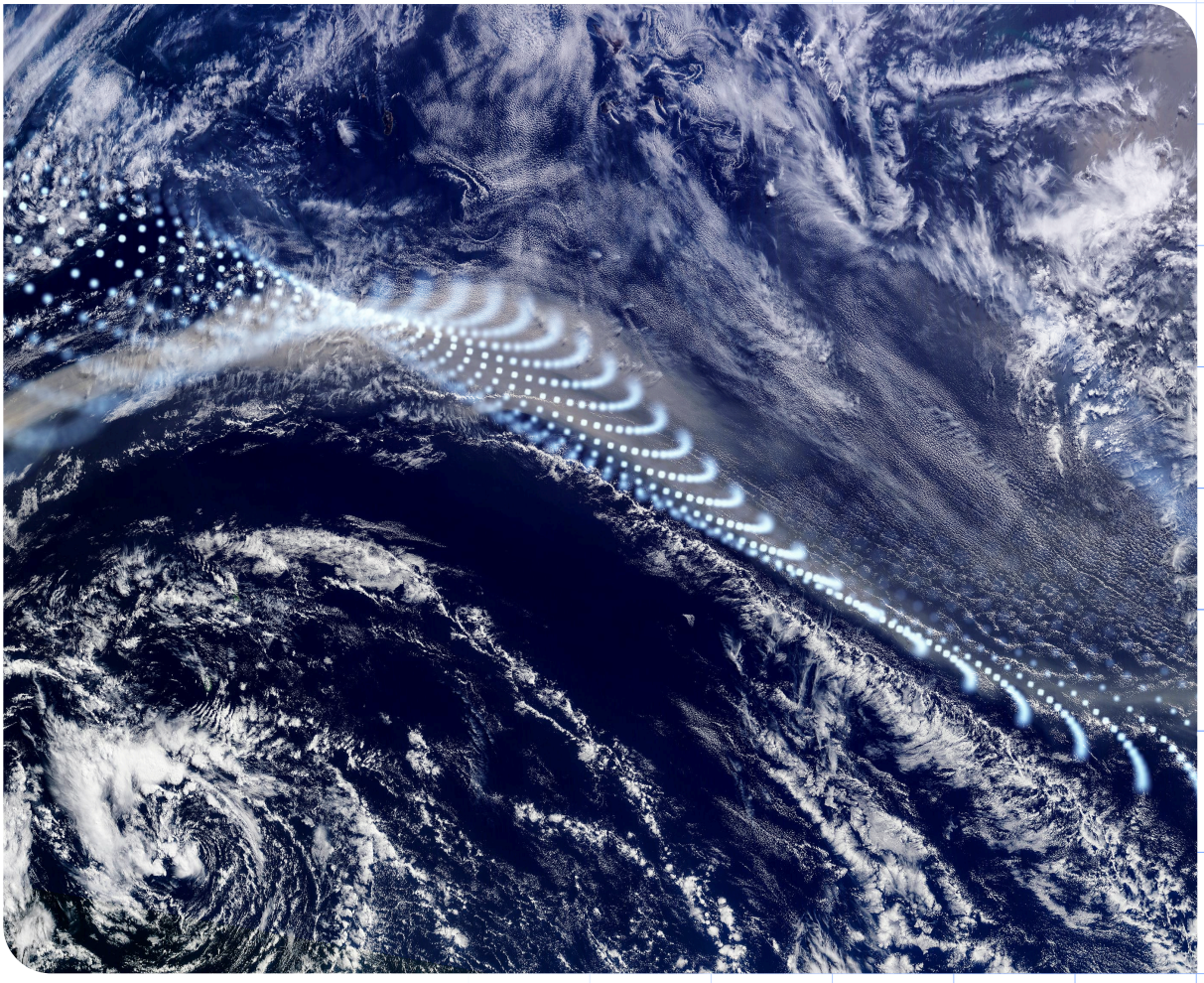


Operational Weather Intelligence

Executive Playbook for European TSOs with a Practical Framework for Weather-Informed Decisions

DTN

Confidence for the Decisions That Move the Grid

European TSOs face more volatile generation, tighter capacity constraints, and faster-moving operational risk.

The Core Idea

The advantage of operational weather intelligence is knowing how changing conditions affect operations and what decisions to make next.

Why This Matters

- Renewable generation increases uncertainty
- Congestion raises operational constraints and economic pressure
- Existing infrastructure is often unable to transport more power
- Severe weather affects assets and people simultaneously

What This Playbook Delivers

- Renewable generation increases uncertainty
- Congestion raises operational constraints and economic pressure
- Existing infrastructure is often unable to transport more power
- Severe weather affects assets and people simultaneously

Primary Promise

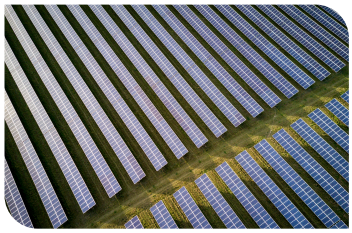
Help your organization identify one weather-influenced decision that can be improved now and build from there.

Four Forces Are Reshaping European Transmission Operations



Electrification

Demand is rising and becoming more weather-sensitive.



Renewable Integration

Atmospheric variability increasingly translates into system variability.



Infrastructure Constraints

New build takes time; existing assets must be used more intelligently.



Operational Risk

Extreme conditions can affect generation, capacity, field work, and resilience at the same time.

Executive Takeaway

The operating environment is becoming more interconnected. A single weather event can now affect generation, transmission capacity, field operations, and system reliability at the same time.

From Forecast to Decisions



From Weather Information to Operational Action



Traditional Forecast

- What conditions are expected?
- When will they occur?
- How severe could they become?

Operational Weather Intelligence

- Which assets and processes are exposed?
- What decisions should change?
- How much decision time remains?

The Practical Difference

Operational decisions improve when weather is evaluated in the context of assets, operations, and available decision time.

Five Connected Areas of Operational Value



Manage Renewable Variability with Greater Confidence



Renewable Variability Affects

- Forecast deviations affect reserves and dispatch
- Regional variability shifts power flows
- Decision options shrink as the operating window closes

Better Intelligence Supports

- Assess forecast confidence, not just point values
- Anticipate balancing and congestion impacts together
- Prepare flexible resources before disruption

Decision Prompt

Where does renewable forecast uncertainty have the greatest operational cost for your organization?

Find out more at **dtn.com**

Increase Usable Capacity Without Compromising Reliability



Weather Changes

- Conductor cooling
- Thermal capacity
- Expected congestion
- Transfer options and curtailment

Better Intelligence Supports

- Dynamic line rating
- Forecast-informed capacity planning
- Improved renewable accommodation
- Lower renewables curtailment

Core Objective

The objective is to maximize available transmission capacity by understanding how asset limits change as weather conditions evolve.

Find out more at **dtn.com**

Move from Severe-Weather Response to Proactive Resilience



Severe Weather Changes

- Assets and operating regions become exposed
- Access and safety conditions can deteriorate quickly

Better Intelligence Supports

- Identify exposed assets and operating regions earlier
- Connect forecast thresholds to defined actions
- Coordinate control room, field, and emergency teams from one operational picture
- Position people and resources before conditions deteriorate

Operational Reality

Preparedness improves when severe weather risk mitigation is planned before operating conditions begin to deteriorate.

Find out more at **dtn.com**

Protect Critical Assets and Field Personnel



Asset Decisions

- Inspection priorities
- Substation and corridor monitoring
- Maintenance timing
- Assess emerging contingencies

Workforce Decisions

- Personal safety (lightning, winds, temperature)
- Heat and cold stress
- Access-route risk
- Optimise maintenance planning

Operational Reality

Preparedness improves when severe weather risk mitigation is planned before operating conditions begin to deteriorate.

Find out more at **dtn.com**

Create One Shared Operational Picture



- Use consistent forecasts, thresholds, and terminology across teams
- Embed intelligence into the systems where decisions already happen
- Translate weather events into role-specific guidance
- Give leaders decision-oriented exposure and action summaries instead of generic weather reports

The Outcome

A shared operational picture enables faster coordination, fewer conflicting interpretations, and more consistent operational action.

Find out more at **dtn.com**

How Weather Intelligent Is Your Organization?



Start with One High-Value Operational Decision



Six Questions to Reveal Your Next Opportunity

1. Which operational decision is most impacted by weather uncertainty?
2. Are decision thresholds defined before mitigations action are executed?
3. Where do organisations still independently interpret weather information?
4. Is intelligence embedded in the systems operators already use?
5. Can leaders see operational exposure and recommended actions?
6. Do past-decision reviews improve future procedures?

Where Do I Get Started?

Request an operational weather intelligence maturity conversation.

Find out more at **dtn.com**

START THE CONVERSATION

Every TSO Has a Highest-Value Weather Decision. Find Yours.

Better weather-informed decisions improve reliability, resilience, transmission capacity utilization, workforce safety, and organizational confidence. The first step is identifying where they create the greatest operational value.

Ready to Identify Your Highest-Value Operational Decision?

Request a Consultation



Learn More **dtn.com**

Germany: +49 3091 73 9333
(German support available during office hours)

Switzerland: +41 71 588 07 00
(German support available during office hours)

The Netherlands: +31 3080 81 213
(Dutch support available during office hours)

UK: +44 2039 66 0300

DTN

dtn.com
Find us: