Stargate
within EU Green Deal

Project Fact Sheet

Intelligent Terminal Command Centre

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement GA101037053

01 BASIC PROJECT INFORMATION

Project name	Intelligent Terminal Command Centre
Partners involved	IES and Brussels Airport Company
Implementing airport / site	Brussels Airport Connector building: security screening and border control areas.
Period tested	Ongoing testing since summer 2024
Project lead / contact	IES

02 OBJECTIVE

What are we trying to solve or tackle with this project?

Help facility and energy managers anticipate thermal discomfort in busy terminal areas. The ITCC turns Digital Twin forecasts for weather, congestion and HVAC response into Smart Alerts showing where, when and for how long comfort risk may occur, supporting proactive human decisions rather than replacing the BMS or automating control.

Success criteria

Facility and energy managers can use IES Live to combine live measured data with Digital Twin forecasts, receive timely and actionable Smart Alerts, understand emerging comfort risks and act early to improve terminal conditions.

03 APPROACH (HOW WE TESTED)

Test set-up & method

IES configured a physics-based Digital Twin of the Brussels Airport Connector in IES Live. Cloud simulations combine forecasted weather with low, medium and high congestion scenarios to predict hourly thermal comfort over 2–3 days. Threshold exceedances generate Smart Alerts through the dashboard and email notifications.

Data & measurement



KPIs: thermal comfort, alert timing and duration, congestion scenario and data completeness. Inputs include live measured temperature, humidity, CO_2 and HVAC power data in IES Live, together with weather forecasts and congestion data.

Risks & mitigations

Main risks are missing, incomplete, noisy or inconsistent environmental, HVAC and congestion data. Poor data can weaken forecasts, cause unreliable alerts and prevent robust validation. Mitigation: data-quality checks, gap monitoring, clear ownership and documented assumptions.

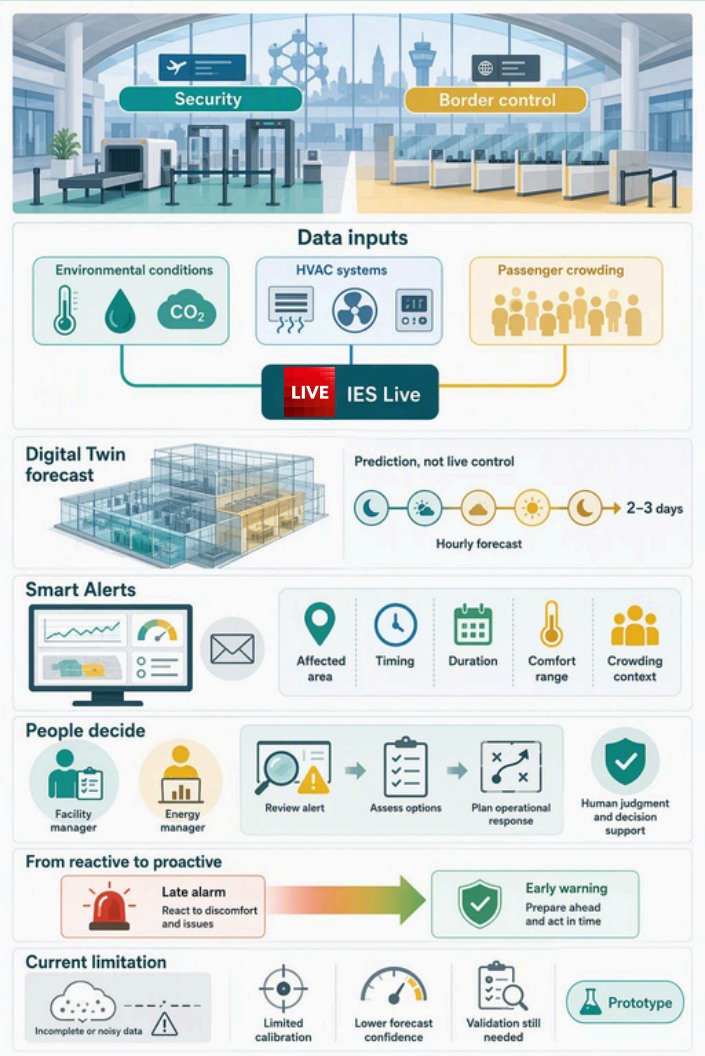
Limitations

Missing, incomplete or inconsistent environmental, HVAC and congestion data limits model calibration, forecast confidence and Smart Alert validation. Live data coverage and quality must improve before the ITCC can be deployed for operational use.

04 RESULTS & IMPACT

Key results

- The ITCC demonstrates predictive thermal-comfort support in the Brussels Airport Connector security and border-control areas.
- IES Live combines environmental, HVAC and congestion data with hourly Digital Twin forecasts over 2–3 days.
- Dashboard and email Smart Alerts show the affected area, timing, duration, comfort range and congestion context, helping facility and energy managers prepare for emerging risks.
- The prototype supports a shift from reactive monitoring to proactive decisions, but missing or poor-quality data still limits calibration, forecast confidence and operational validation.



05 RATINGS (QUICK ASSESSMENT)

Deployment Approach

How standardised is the solution: can it be deployed off the shelf, or does it require extensive customization?

Off The Shelf — Custom-Built

Investment Magnitude

From low-cost deployment to major investment.

Low Investment (less than €10k) — High Investment (more than €15mio)

OPEX ■ □ CAPEX

Sector Readiness

From non-existing or emerging standards, regulations, and certification pathways to fully established industry practices.

Emerging Framework — Established Framework

Innovation Maturity

How does the solution score in terms of maturity, from low TRL experimental/pilot-stage to high TRL market-ready.

Experimental — Market-Ready

Operational Impact

Does the innovation deliver targeted improvements or rather drastically transform processes and/or operations.

Incremental Improvement — Transformational Change

06 NEXT STEPS / RECOMMENDATION

Recommendation

Continue as a controlled pilot and decision-support tool; do not treat alerts as validated operational instructions until airport data quality, user testing and governance improve.

Next steps

1. Improve the completeness and reliability of environmental, HVAC and congestion data.
2. Confirm live data flows correctly into IES Live.
3. Validate forecast processing, alert thresholds and notification timing.
4. Test Smart Alerts with facility and energy managers.
5. Compare forecasts with measured conditions before operational deployment.

Links: https://www.iesve.com/