The Iberian Power Outage: Impact on Renfe and lessons learned

September 2025

RENFE

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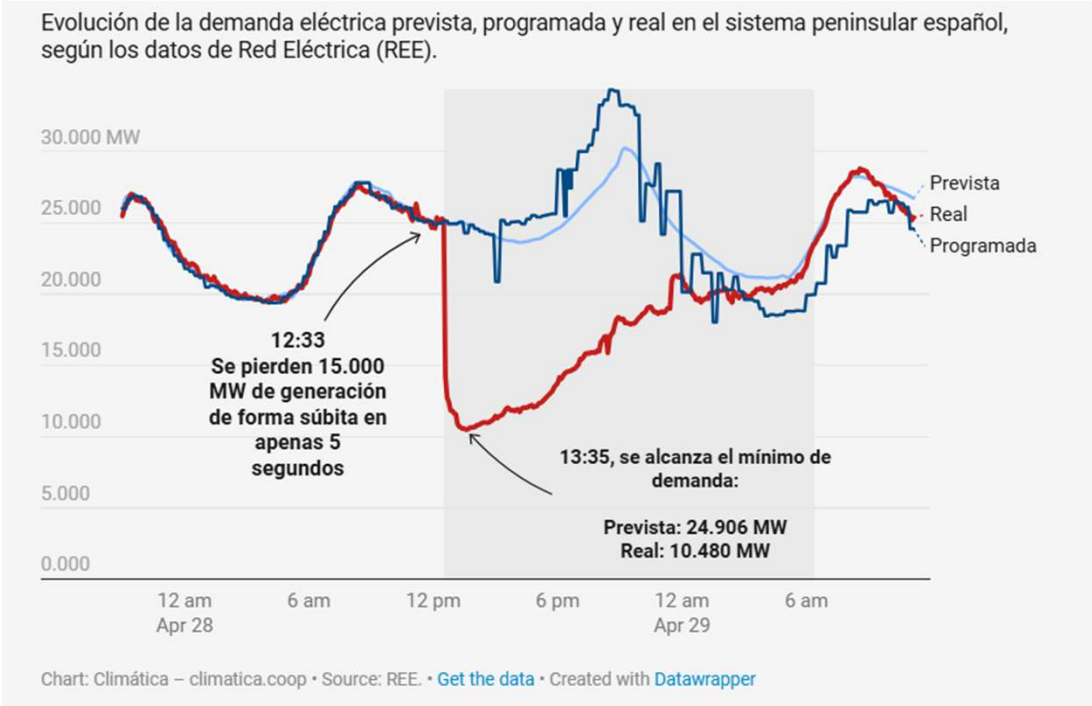
Intro

The Blackout

On April 28 2025, a widespread electrical outage significantly disrupted rail services.

- The incident affected both Public Service (Cercanías and Medium Distance) and Commercial Services, resulting in considerable operational, economic, and reputational consequences.
- Train services came to a halt at approximately at 12:33 p.m.
- The consequences spread through April 29 and 30.



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Initial Outages

•12:32 h – Power outage in catenary and installations across all high-speed and conventional lines.

•14:00 h – Mobile communications lost.

•19:15 h – Landline telephone service intermittent.

•20:45 h – Power can be supplied from Northern energy control systems, but not beyond Valladolid or Zamora to the South.

Centenares de personas frente a la estación de tren de Barcelona-Sants durante el apagón. REUTERS/Albert Gea

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🔁 Power Restoration Timeline

- **22:10 h** – Power begins to restore in segments across:
  - South
  - Levante
  - Northeast
  - North
  - Mediterranean
- **22:30 h** – Power restored in the North
- **23:27 h** – Power restored in Levante
- **00:30 h** – Power restored in Northeast and Mediterranean

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⚠️ Southern Region Recovery

- **23:40 h** – Power restored from Atocha to Yeles and Brazatortas – Conquista – Villanueva de Córdoba
- **00:00 h** – Power restored from Villanueva to Adamuz (exclusive).
- **00:20 h** –Adamuz to Hornachuelos.
- **05:45 – 06:48 h** – Full power restoration across all lines.

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Travelles and services affected by the Blackout

	Public Service	Commercial Service
	**61,000** On board	**18,794** On board
	2,20 M Unable to travel	**84,223** Unable to travel
	**5,511**	**304**

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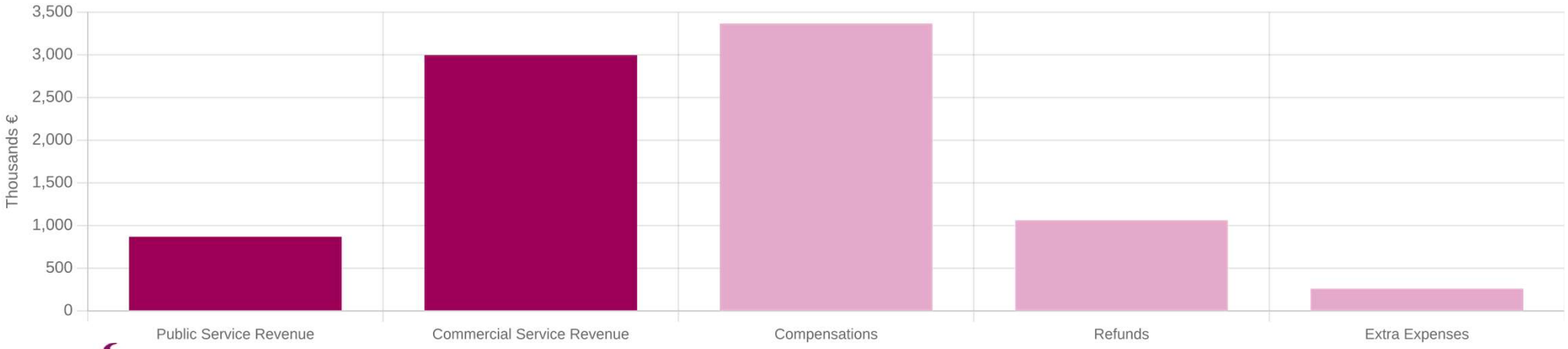
Economic Impact

2.2M
Affected travelers

5,815
Interrupted trains

7.7M€
Economic impact

Breakdown of economic impact (thousands €)



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Economic Impact

Public Service	€ 870,000 * estimated revenue loss caused by the blackout, considering that free travel is currently in effect for frequent travelers on Commuter and Medium Distance trains	
Commercial Service	Revenue impact:	€ 2,999,229
	Expected compensation:	€ 3,368,920 * assuming all passengers claim compensation
	Costs incurred from ticket refunds:	€ 1,062,572 *estimated cost from 32,211 ticket refunds
	Extraordinary personnel costs (Logirail):	€ 5,410.59
	Other economic impacts (taxis, hotels, buses, etc.):	€ 263,022

EXTRAORDINARY STEPS

1

Coordination with civil protection and UME

Water, food, and blankets were provided

2

Terminal openings for overnight stays

During the nights of April 28-29 and April 29-30

3

Free hotel accommodations

For people with special needs

EXTRAORDINARY STEPS

4 Free commuter services with no cost included on April 29

5 Alternative road transportation services to move travelers from areas without connection

6 Suspension of infractions

Intro

Travellers Rights

Renfe implemented extraordinary after-sales measures, according to Article 18 of Regulation (EU) 2021/782 of the European Parliament and of the Council on the Rights and Obligations of Rail Passengers.

The general guidelines were as follows:

- The Ticketing System allowed changes and cancellations free of charge for trains scheduled on April 28 and 29.
- Need of alternative public transport, properly documented was reimbursed (Article 18.3)
- Allowances due to delays were enabled according to Article 19
- Expenses for meals and accommodation was reimbursed if travellers could not receive regular assistance according to Article 20, Section 2 a-b.

Viajeros de tren afectados por el apagón masivo ocurrido hacia las 12.30 del pasado lunes se agolpan en el acceso a los andenes en la mañana de este martes en la Estación de Chamartín. EFE/JJ Guillén

EMERGENCY CONTEXT

The sudden interruption of the power supply resulted in the immediate detection of **1,879** trains and it is estimated that **2.2 M** travelers were affected

The Crisis Management Committee was established to assess the situation and prioritize relief efforts. Uncertainty and lack of communication hindered coordinated management

As it was a widespread emergency, stations and major urban centers experienced large crowds since mobility within cities was limited and people began leaving their workplaces

PRIORITIES AND CHALLENGES

Key Priorities During the Emergency

- **Passenger Safety:** Ensuring the safety and well-being of all passengers stranded on trains and at stations.
- **Communication:** Maintaining effective communication with passengers, staff, and emergency services despite power outage.
- **Alternative Transportation:** Rapidly organizing alternative transportation options for stranded passengers.
- **Service Restoration:** Systematically restoring train services as power became available in different areas.

Major Challenges Faced

- **Power Dependency:** Critical systems lacked adequate backup power solutions.
- **Communication Breakdown:** Mobile networks became overloaded, hampering coordination efforts.
- **Resource Limitations:** Insufficient emergency personnel to handle the scale of the crisis.
- **Protocol Gaps:** Existing emergency protocols did not adequately address widespread power outages.

REFLECTIONS FOR THE ENTIRE SECTOR

Strategic Considerations

Develop industry-wide power outage response protocols that can be quickly implemented across all railway operators

Establish a centralized emergency coordination system between all transportation providers

Create standardized passenger communication templates for various emergency scenarios

Invest in backup power systems for critical infrastructure and communication networks

Operational Improvements

Implement regular cross-sector emergency simulation exercises

Develop alternative service plans that can be rapidly deployed during infrastructure failures

Establish mutual aid agreements between railway operators for equipment and personnel sharing

Technological Solutions

Deploy autonomous emergency power systems at critical stations and control centers

Implement redundant communication systems with satellite backup capabilities

Develop offline emergency operation modes for critical systems

Create real-time passenger information systems with battery backup

AI and Railway Companies Working Group

A specialized working group has been established to explore AI applications for predicting, preventing, and managing large-scale infrastructure disruptions. The group will develop recommendations for implementing predictive maintenance systems and real-time emergency response optimization tools across the sector.

EXPERIENCE FEEDBACK IN RENFE

Mitigation measures being studied for risk protocols and minimizing the impact of similar situations

FACILITY LOCATION REASSESSMENT

(Crisis management centers and communication networks)

COMMUNICATION SYSTEMS REEVALUATION

GROUND SERVICE EQUIPMENT

Deployment of intercoms, RENFE-branded flags, sound amplification headsets, megaphones, high-visibility vests, and portable barriers at strategic locations.

TRAIN SURVIVAL KITS

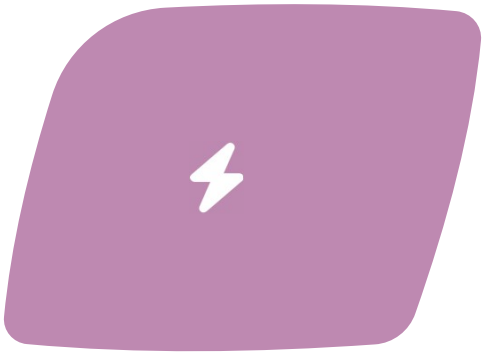
Installation of emergency kits on all trains including battery-powered radios, flashlights, thermal blankets, water, and long-shelf-life food supplies.

CRITICAL APPLICATIONS ASSESSMENT

Identification of essential applications that must remain operational during "zero power" scenarios and development of offline functionality.

EMERGENCY PROTOCOL

Key components of the emergency response protocol. Lessons learned and actions plans



Immediate Response

Activation of the Crisis Management Staff Team within 15 minutes of the incident, with direct communication channels to all operational centers.

Passenger Safety

Prioritization of passenger safety with clear evacuation procedures for trains stopped between stations and coordinated support at stations.

Communication Strategy

Multi-channel communication approach including emergency PA systems, mobile alerts, and station staff equipped with portable megaphones.

Thank you

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