



VESUVIO: where and when Europe's electric trucks will charge

Data, scenarios and analyses for charging and grid planning

What we offer

1. **Site-level demand.** Charging energy and peak power for any location in 30 countries, 2025 to 2045.
2. **Location data beyond open sources.** Over 100,000 truck depots and over 10,000 truck parking sites.
3. **Ranges, not single numbers.** Three ramp-up scenarios to stress-test sites and grid connections.
4. **Independent research.** Transparent, peer-reviewed methods from Fraunhofer ISI.



Reports, dashboards and data:

www.isi.fraunhofer.de

The planning problem

Megawatt and depot charging need grid connections that take years to build, so sites must be secured before the trucks arrive. VESUVIO shows where demand will concentrate and how fast it grows.

Depots dominate, corridors matter

Depots supply about 77 % of truck charging energy in Europe in 2045. In transit countries, en-route charging reaches up to 53 %.

Hotspots are predictable

Faster ramp-up raises demand but barely changes where it occurs. Sites chosen today stay relevant.

Fast Facts

- 30 countries (EU-27, Norway, Switzerland, UK) at 250 km² resolution, 2025–2045.
- >200 TWh/year of truck charging in 2035 and 430 TWh in 2045 (medium scenario; 300 to 470 TWh across scenarios).
- The top 10 % of active areas per country carry between 58 and 92 % of charging energy by 2045.
- Hotspot peak loads reach 51–96 MW in the most affected countries (95th percentile, 2045).

What VESUVIO models

VESUVIO is a spatiotemporal model of battery-electric truck charging across Europe, developed by Fraunhofer ISI in collaboration with the ICCT. It combines:

- market ramp-up scenarios by country and size class,
- synthetic European road freight flows and trip chains,
- depot and en-route charging with weekly load profiles.

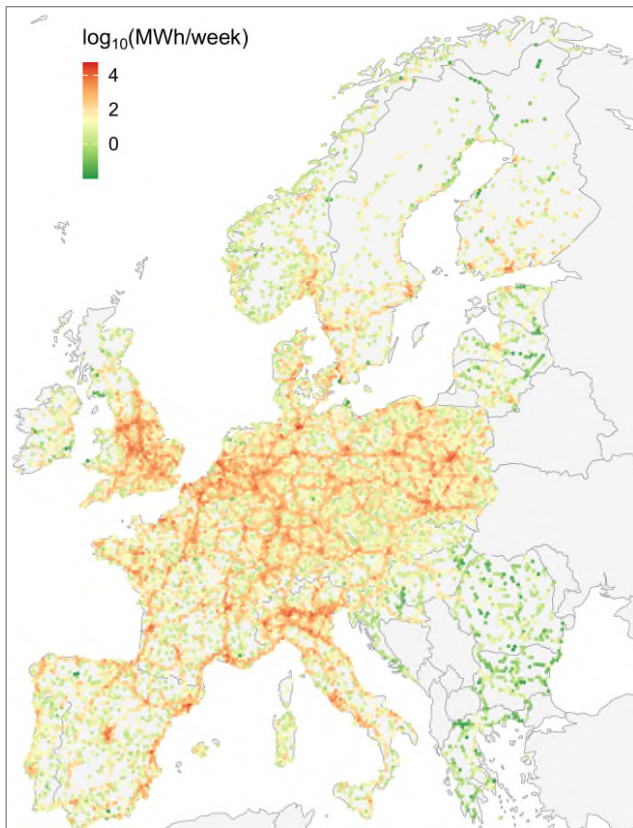
Results include charging energy, peak power, share from long-haul trucking for every 17x20 km² hexagon from 2025 – 2045.

Who it is for

Charge point operators, energy suppliers, distribution and transmission system operators, truck fleets, investors and public authorities planning megawatt or depot charging.

Selected publications

- Link, S. & Plötz, P. (2024): [Geospatial Truck Parking Locations Data for Europe](#). *Data in Brief* **54**, 110277,
- Plötz, P. et al. (2026): [Truck charging demand in Europe concentrates at predictable hotspots requiring targeted grid planning](#). Preprint available at SSRN.
- Link, S. et al. (2025): [European Truck Parking Locations \[Dataset\]](#). Zenodo.



Weekly truck charging energy per 250 km² hexagon, 2035, medium scenario ($\log_{10}$ MWh). © Fraunhofer ISI

Data assets behind the model

Truck parking locations. >10,000 TEN-T sites, open on Zenodo (CC BY 4.0). Update with about 50 % more sites and new variables in preparation.

Truck depots. >100,000 depot locations in 30 countries. Data is not yet public.

Scenarios. Energy and peak power by hexagon, year and scenario. Key results public; full data within projects. Additional scenarios can be computed upon request.

How we work with you

We apply VESUVIO and its data to your questions in small to large research projects with Fraunhofer ISI. Typical formats:

1 Site and regional analysis

Charging energy, peak power and timing for your candidate sites, network area or country, with depot and en-route demand and a ranking of locations.

2 Grid connection screening

Expected truck charging loads per substation area, to prioritise connection requests and grid reinforcement.

3 Data and scenario packages

Extracts of parking, depot and scenario data for your region, prepared and documented for use in your own planning models.

4 Briefings and workshops

Half-day sessions with your strategy or planning team on market ramp-up, hotspots and charging needs.

Terms

Projects run as contract research under Fraunhofer terms. You receive the results for your region; the underlying data remain part of our research and are offered non-exclusively.

Getting started

A short call clarifies your question, region and timeline. We then send a brief proposal with scope, deliverables and cost.

Free to use

Reports, interactive dashboards and the truck parking dataset are public and free to use with citation. Scan the QR code on page 1 to reach the project page.

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About Fraunhofer ISI

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