

ELECTRIC MOBILITY DATASETS

Electric mobility – Charging stations location and status

Charging stations data:

- Static Data: serial number of the charging unit, address (country, city, street, postal code), GPS coordinates, minimum & maximum available charging power, plugs type related to the charging point
- Dynamic Data: the status of all attributes (status of charging station: busy/in maintenance/available, not available) of a charging station that do change on a regular basis (real time, according to the changing status)

Electric mobility – Charging history

Charging history and users consumption profiles compiled in kWh by Enel X through the App.

Electric mobility – Users data

Users data (payment methods, type of customer, GPS, kWh. km) collected through e-mobility app.

Electric mobility – Electric vehicles details

Electric vehicles details provided through the e-mobility App registries. Data available:

- EV model
- EV Registration year
- Battery capacity
- Efficiency
- Power
- Socket

Electric mobility – Fleet management data

Fleet management data collected through fleet electrification management solutions.

Enel's I&N EV fleet data also collected.

Example of data available:

- List of drivers
- Total kWh recharged
- Total number of charging sessions

Electric mobility – Juice Pass users profiling and behavior

Based on data collected by the mobile app (e.g. geo-localization, Wi-Fi connections, accelerometer measures), car DONGLE, Juice Pass profiles users (e.g. work premises,

religion, kids' school, sport habits) and forecasts movements suggesting optimal charging strategies

Electric Mobility – Electric buses

Electric buses data (number, charging stations, charging profiles, O&M data) managed through IoT systems

SMART CITY DATASETS

Smart City – Lighting points data

Lighting points data collected by Enel X:

- Number of lighting points
- Location
- Revenue in €
- Energy Consumption in kWh
- Fault monitoring: trends, technical assistance requests, performance tracking

Smart City – Human mobility

Data collected on urban mobility dynamics, such as the distribution of people present in the city's various census areas, origins and destinations of flows between the different areas, estimation of the number of residents, commuters and tourists.

The data used comes from mobile apps, connected vehicles, navigation systems and maps.

Smart City – Vehicular traffic

Historic and real-time data on traffic present across the entire urban road network categorised according to commercial and private vehicle flows, average speed data and the occurrence of unusual events enable the transport of both people and goods to be planned and monitored to ensure efficiency and safety.

The data used comes from mobile apps, connected vehicles, navigation systems and maps.

Smart City – Road surface quality

Data on irregularities identified in the road surface and use the International Roughness Index (IRI) to classify the level of road unevenness, for all streets and roads up to M5 level. As well as geolocation data of potholes and bumps.

The data used comes from mobile apps, connected vehicles, navigation systems and maps.

Smart City – Inventory of municipality assets and services

Inventory of municipality assets (eg. Lighting points, buildings, traffic light, furniture) and services (eg. hospitals, schools, museums) collected through satellite, AI and Public Administration Open Data. Data is also purchased from 3rd parties.

FINANCIAL SERVICES DATASETS

Financial Services – Enel X Pay users and transactions

Payment transactions and data of Enel X pay customers, namely:

- Anagraphical data (name, surname, contact info, ID, sex, age)
- Transactional data (payments made by each customer as quantity and place of the transaction for premium users, non premium users just bill payment information)

MARKET DATASETS

Market – Customer

From customer the following data is compiled:

- **Segment:** Residential or Business
- **Personal data:** Age, sex, nationality, seniority as Enel customer
- **Marketing contacts & consents:** Phone number, cell number, email address, marketing consent
- **Geographical:** address, city, province, region
- **Claims**
- **Dunning:** Reminders, warning letters, date of execution, level of warning
- **Orders:** Product/Activation/Operation requested, date of request, date of updates
- **Marketing campaigns:** Name of the campaign, channel, orientation, type of offer, type of action, response, redemption

Market – Supply

By supply it can be identified the following data:

- **Acquisition:** Channel, sub-channel, acquisition date
- **Geographical:** Address of the supply, city, province, region
- **Product information:** Information related to the active product on the supply point. For each supply (gas, power) a customer can have a certain product active (for example the product Ore Free, Luce 30)
- **Billing:** Amount, consumptions, billing frequency, type, refund, unpaid, wrong bills

- **VAS:** Value Added Service contains information on the type of bill payment (web bill, bank debit)
- **Source Market:** indicates the market of origin of a supply (free market / protected market) and also contains information relating to the supply such as the activation date, the previous trader.
- **Payment Type:** Type of payment, date of payment
- **Prices:** Price composition of the energy product (raw material value, energy price (in ranges), threshold, price over threshold, discounts)
- **Load curve:** Power and gas load curve (consumption profile) in kWh

WATER RESERVOIRS DATASETS

Water Reservoirs – Historical levels, Intakes and Storage Capacity

Data of water reservoirs collected:

- Historical levels in m & MWh
- Intakes in m³/s - data calculated
- Storage capacity in Mm³ & MWh
- Water Spill in Mm³ & MWh
- Snow Cover measures (Feb-July) in Mm³ & MWh
- Production by Plant
- Plant registry

WEATHER DATASETS

Weather – Temperature measures and forecasts

Data collected in °C:

- Air temperature and forecasts
- Wet bulb temperature and forecasts
- Perceived temperature and forecasts
- Measure of temperature chill wind
- Measure of temperature heat index
- Sea water temperature

Weather – Wind measures and forecasts

Wind speed, direction and intensity collected in m/s, km/h, knots, degrees, mm

- Wind speed measures and forecasts
- Wind direction measures and forecasts
- Wind gust measures and forecasts
- Wind intensity and forecasts

Weather – Precipitations measures and forecasts

Data collected in m, mm, mm/d, mm/h and kg/m²

- Precipitations measures and forecasts
- Forecast of air precipitations
- Seasonal forecast of precipitations
- Large-scale and convective precipitations
- Precipitations measurements on the ground
- Rain

Weather – Solar radiation measures and forecasts

Data collected in W/m² and h:

- Solar radiation measures and forecasts
- Net irradiance data and forecasts
- Global radiation
- Sunshine duration
- Surface solar radiation
- Global and Diffuse horizontal irradiance

Weather – Humidity measures and forecasts

Data collected in %:

- Relative humidity and forecast
- Specific humidity
- Spherical humidity
- Humidity measures and forecasts
- Relative air humidity

Weather – Pressure measures and forecasts

Pressure data collected in mbar and Pa:

- Pressure and forecast
- Mean sea level pressure and forecast
- Sea level pressure and surface pressure
- Atmospheric pressure

Weather – Visibility measures and forecasts

Data collected in m:

- Forecast of visibility
- Surface visibility
- Visibility at 2m

Weather – Snow measures and forecasts

Data collected in m, cm, mm, kg/m²:

- Snow depth
- Snow fall
- Snow melt
- Snow precipitations and forecasts
- Snow density
- Snow water equivalent
- Snow height

Weather – Cloudiness measures and forecasts

Data collected %:

- Cloud cover
- Clear sky

Weather – Fire risk indexes and forecast

2 type of data from models:

- **Fire Weather Index:** a dimensionless index that measures fire risk. Given by numerical physical models.
- **Number of days at fire risk:** above threshold 30-30-30-30 (temperature, relative humidity, wind speed). Given by numerical physical models

INFRASTRUCTURE & NETWORKS (I&N) DATASETS

I&N – Computer vision

Data collected by I&N during helicopters, cars, drones and on foot inspections consisting on images, LIDAR point clouds and, in the future, also satellite and thermal images. Asset inventory, network map, anomaly detection, information on the state, type and density of vegetation is collected.

I&N also collects corporate data and data from external sources.

I&N – Grid operations

Voltage, power, active and reactive energy, load curves collected by I&N in two domains:

- Metering domain: Loads and energy (active and reactive).
 - Load profiles are energy curves (both consumption and injection) for a specific pod-date. They are usually collected once a day.
 - Energy (active and reactive) refers to the total energy consumed/produced every day or month.
- Grid domain: Voltage and Power (MV and HV)

I&N – Grid Outages & Maintenance

Data collected on:

- **Outages and failures** (e.g., accidental with/without localization, rolling blackout, maintenance, planned interventions)
- **Maintenance** (grid investments, inspections, periodic or on-condition maintenance, safety measures)

GLOBAL PROCUREMENT DATASETS

Global Procurement datasets

Global Procurement has an extended database with information on:

- Purchase requests and planning
- Tenders
- Contracts, agreements and amendments
- Supplier data: company name, VAT number, address, supplier qualification (legal, economical, technical)
- Vendor rating

BUILDINGS/INDUSTRIAL SITES DATASETS

Buildings – Temperature

Temperature in °C collected through sensors installed in business, government and residential buildings (in residential buildings through Homix – smart home appliances).

Enel X collects external building temperature in °C.

Buildings – Humidity

Humidity data registered in % through sensors located at business and government buildings.

Enel X collects external building humidity in %.

Buildings – CO2 concentration

Enel X IoT systems allow to monitor and collect CO2 levels in ppm at business and government buildings

Buildings – Energy consumption

Energy consumption collected in kWh for:

- Electric Energy received and delivered - DR
- Thermal Energy
- Cooling Energy

Buildings – Flows and volumes

Flows and volumes measures collected in mc/h, mc/s and mc for:

- Air
- Water
- Gas

Buildings – Remote control appliances

Remote control usage information (on/off status and number for activations):

- Ventilation
- Activation automatic start-up
- Shooting and Delivery Temperature Setpoint Activations
- Minimum external air damper activation command
- Device used for CO2 control
- Supervision mode setting
- Room washing activation
- Minimum opening of the FreeCooling damper
- Supply fan command

- Forcing damper opening with CO2 control from keypad

Buildings – Appliances O&M data

Appliances O&M data (boilers, HVAC, PV...) collected at residential buildings through maintenance and repair services by Enel X.

SEECA (SOCIAL, ECONOMIC, and ENVIRONMENTAL CONTEXT ANALYSIS) DATASETS

SEECA – Generics about the project

Different data about the characteristics of the project:

- Number of panels
- Installed power (MW)
- Number of transformers
- Type of plant (sun tracking, simple, etc.) Voltage connection
- Data about electric substation
- Plant's location

SEECA – Social analysis

Demographic data of the populations affected by the project:

- Population data (# men/women) per city, per age
- Population density
- Migration flows
- Population growth estimates
- Scholar level, pupils in public and private institutions
- Type of buildings
- Cultural and archeological sites
- Financials flows per inhabitants

SEECA – Economic analysis

Economic indicators of the region:

- Local GDP (absolute and rate of growth)
- Rentals
- Gross Value Added
- GDP per sector

- AROPE indicator (At risk of poverty and/or Exclusion)
- Companies per sector
- # employees per company
- Tourism
- Unemployment


SEECA – Environmental analysis

Environmental data of the region:

- Land use
- Water sources
- Humid areas
- Climate trends
- Endangered species

Each dataset contains different details on description, depth (years of historical data), granularity (temporal and spatial), type of data (raw, elaborated, third parties), restrictions and geo-coverage. The Solver can find below an example for Water Reservoirs (some fields cannot be shown due to sensitive information):

Water Reservoirs – Historical levels, Intakes and Storage Capacity



<p>Description</p> <p>Data of water reservoirs collected:</p> <ul style="list-style-type: none"> • Historical levels in m & MWh • Intakes in m³/s - data calculated • Storage capacity in Mm³ & MWh • Water Spill in Mm³ & MWh • Snow Cover measures (Feb-July) in Mm³ & MWh • Production by Plant • Plant registry 	<p>Depth</p>	<p>Granularity</p>
		<p>Type of data</p>
		<p>Restrictions</p>

Geo coverage*

510 Plants	5 Plants	3 Plants	2 Plants	27 Plants	1 Plants	3 Plants
153 Plants	13 Plants	12 Plants	19 Plants	8 Plants	5 Plants	

