



E-mobility and its relations with the power sector

Next Generation Mobility 2024

Enrico Pochettino – direzione Innovazione

18/09/2024

Iren Group at a glance

IREN is one of the largest and most dynamic multi-utility company active in Italy, with a market capitalization of about 2.4 billion euros and a FY 23 EBITDA reaching 1,2 billion euros.

Networks



Electric energy
distribution



Gas
distribution



Integrated water
service



District
heating

Waste



Waste collection



Treatment and disposal

Energy



RES and BESS



Power production and CHP

Market



Commodity (Gas)



Commodity (EE)



Iren Plus

Smart solutions



Energy
efficiency



E-mobility



Technological
services for public
and private bodies

2.2

Million customers
ENERGY SECTOR

3.8

Milion inhabitants
WASTE MANAGEMENT

2.9

Milion inhabitants
WATER SERVICE

6.5

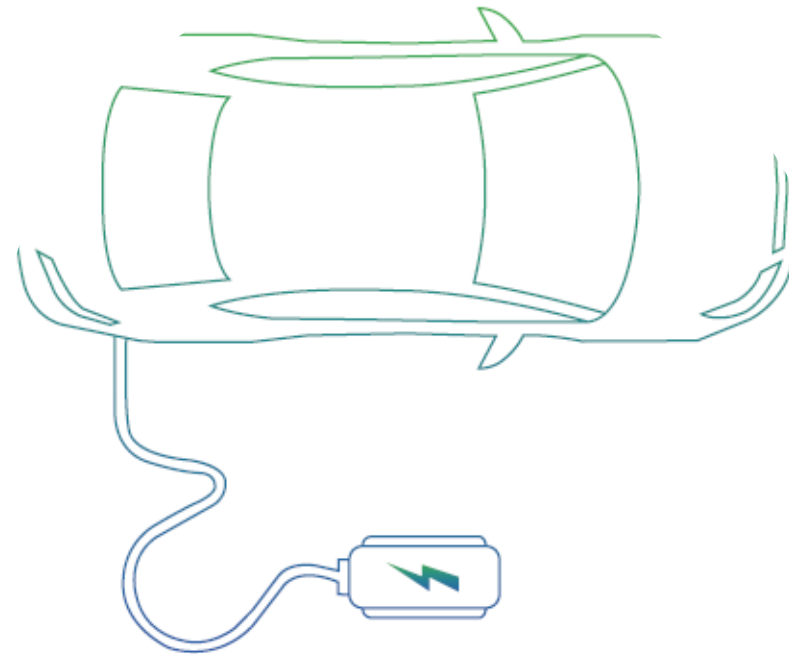
Billion €
FY 2023 REVENUES

> 11.000
EMPLOYEES



IrenGO: Market approach and business solutions

- IrenGO is the BRAND born from the experience of Iren Group in the **conversion of its fleet to electric mobility**
- IrenGO supports the business world to identify the **best solution for infrastructure parking lots** with direct and alternating current charging points to support the internal and external fleet
- IrenGO offers **turnkey services** for the creation of the entire **charging infrastructure** (construction and electrical works), but also after-sales services such as ordinary and extraordinary maintenance
- IrenGO integrates its services with a **management platform** for monitoring charging but also for monitoring the electric fleet
- Thanks to the **IrenGO APP** it is possible to resell the charging service making the **infrastructure geolocatable and attractive** for EV-drivers

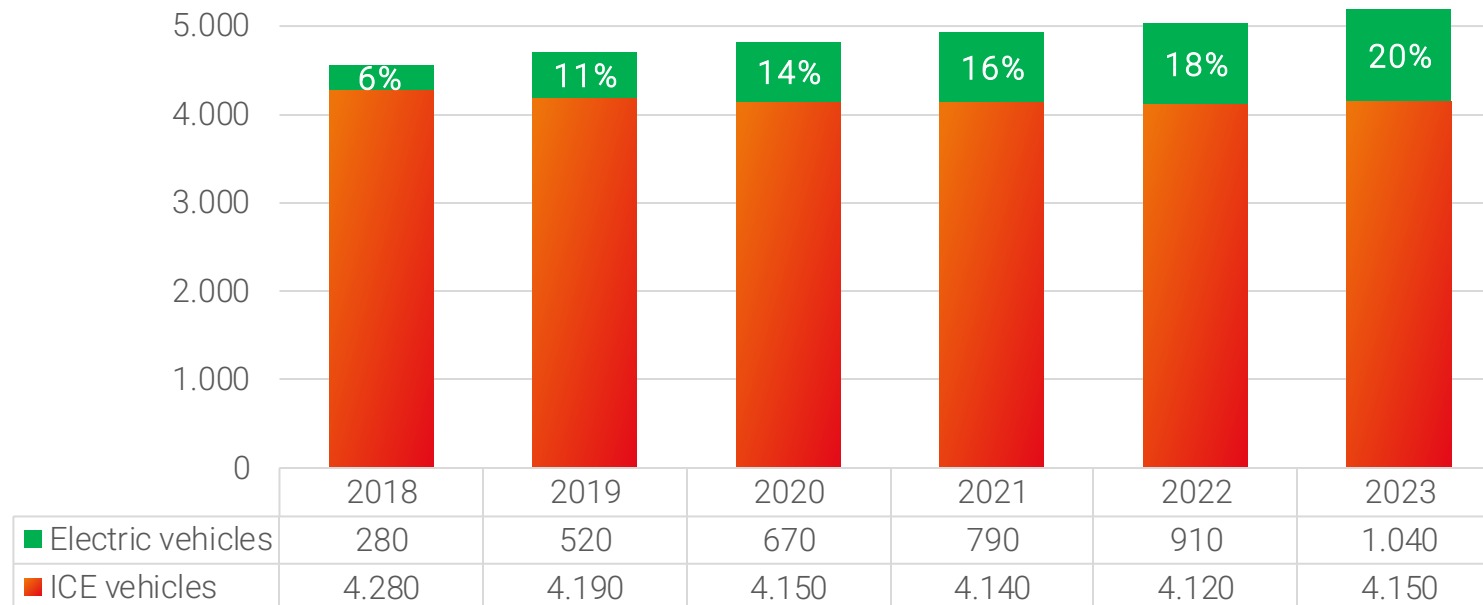


Iren Group: fleet data

The electrification project of Iren Group's operational vehicle fleet was launched in 2018, with the **replacement of a portion of endothermic vehicles with full electric vehicles**:

- 470 cars (standard and mini vans),
- 200 vans,
- 370 waste collection vehicles.

In 6 years, the replacement plan has proceeded with the inclusion of **1,040 vehicles (20% of the Fleet)** and the installation of **1,090 charging points**.



Impact of electrification and electric mobility on power grids



Current state and ongoing changes

The **electric vector** that represents now **22% of total energy consumption** will rise to **60% in 2050** in the EU.

On the production side, as foreseen by Italian PNIEC, **electric renewables** will steeply grow from

- **now:** 61 GW of installed RES-E; 37% of demand covered by RES-E, to
- **2030:** 131 GW of installed RES-E; 63% of demand covered by RES-E.

Coming challenges

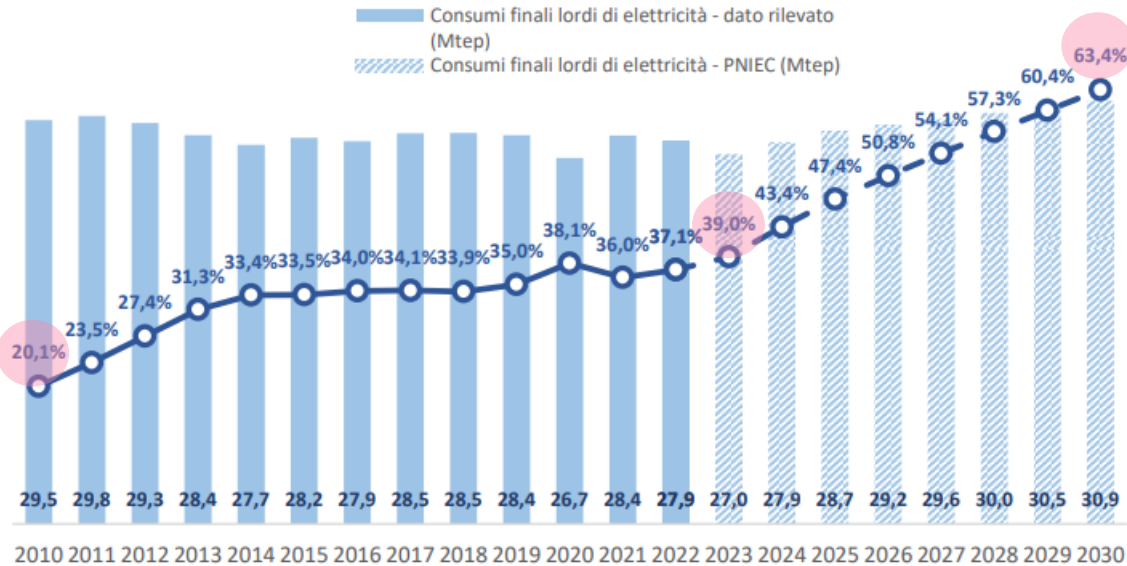
The primary challenge is the potential **overload on the distribution networks**:

- **high power demand**, also from EV chargers, particularly in urban areas and along highways;
- management of **variability of energy flows**;
- **unpredictability** of charging modes of EVs (time of charging and its duration, location of charging).

Available solutions

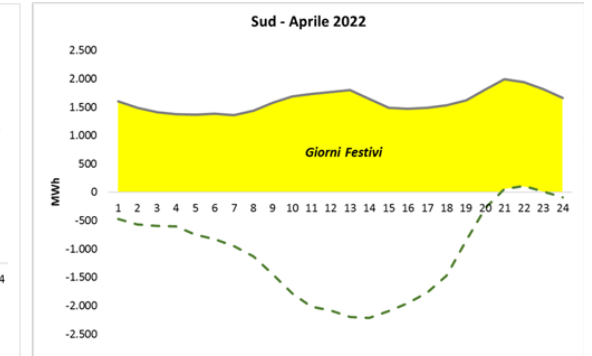
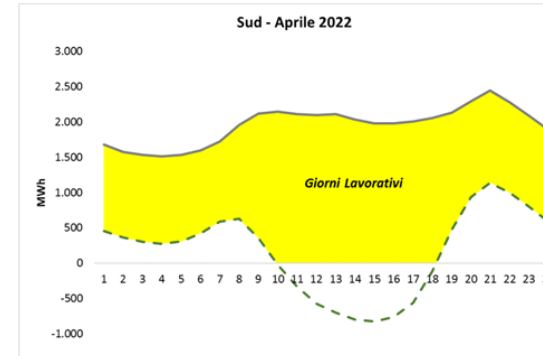
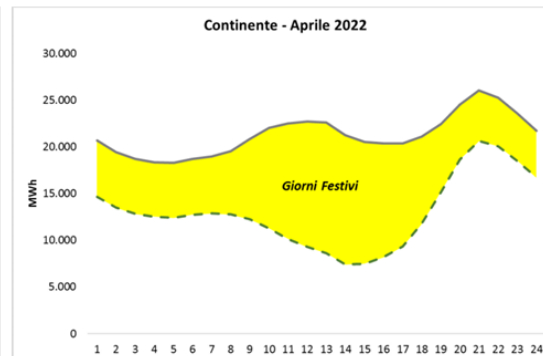
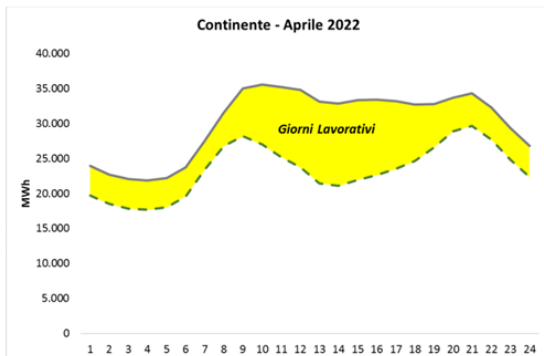
- **Upgrading the existing infrastructure** to support higher power demands and ensure reliable service.
- Deployment of **charging stations integrating electric energy storages**.
- **Smart charging technologies** like Vehicle-to-Grid (V2G).

The integration of Renewable Energy Sources



The integration of a high rate of variable renewable energy sources means a **deep change in the management** of power plants and energy systems. In the South Area of Italy, the production of electricity from wind and solar in some hours of the day is higher than the energy demand, with risk for **curtailment**.

By providing additional “energy storage on wheels”, **electric vehicles** can help stabilize the grid, especially when there are fluctuations in energy supply from renewable sources.



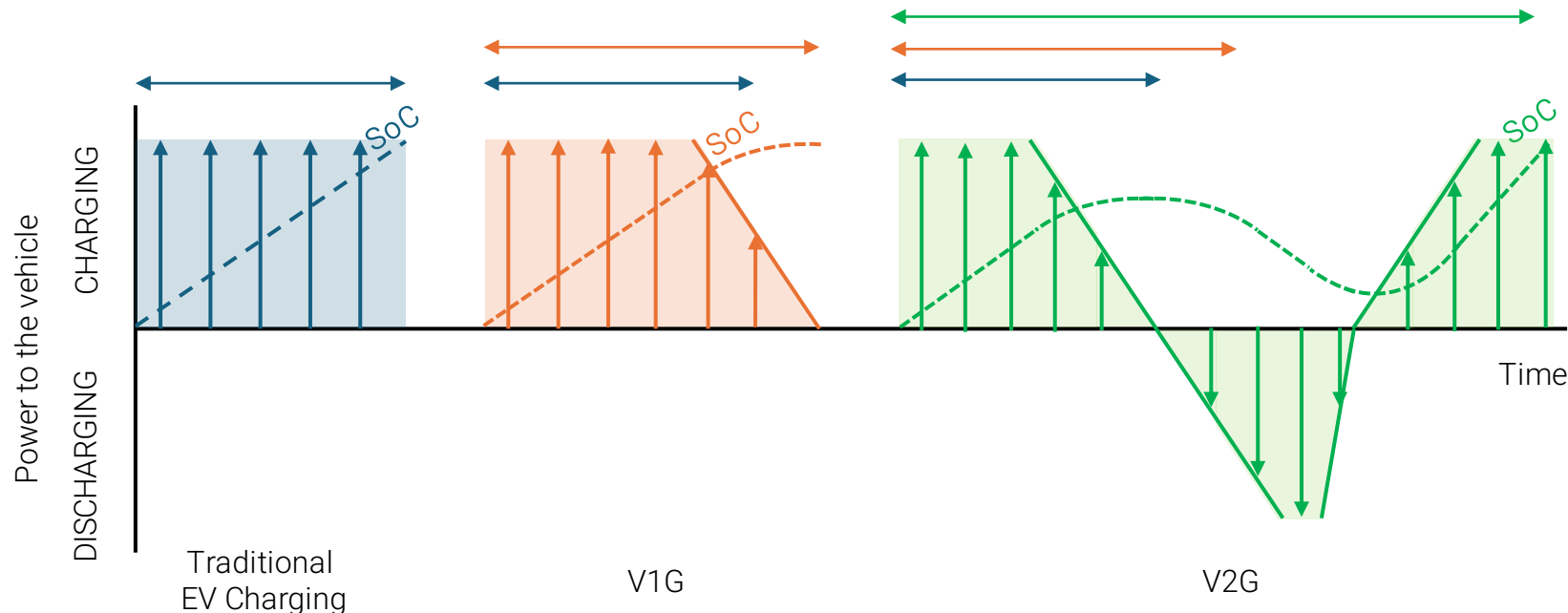
—— Total electric load - - - - Residual load (not covered by RES)

Traditional Charging, Smart Charging (V1G) e Bidirectional Charging (V2G)

Differently from the traditional EV charger with no modulation, a “flexible” charging device is capable of dynamically varying the intensity and direction of power flow between the grid and the EV.

The term «V1G» refers to a charging mode based on the **mono-directional modulable energy exchange** from the network to the vehicle. The device is **logically integrated** with the energy source (grid or local RES).

«V2G»: bi-directional energy flows from the network to the vehicle. It exploits a **widespread, granular capacity** (even aggregated) to increase the useful effect. However, the **lack of standardized protocols and technologies** and the **unclear regulatory/tariff framework** put a barrier to V2G diffusion.



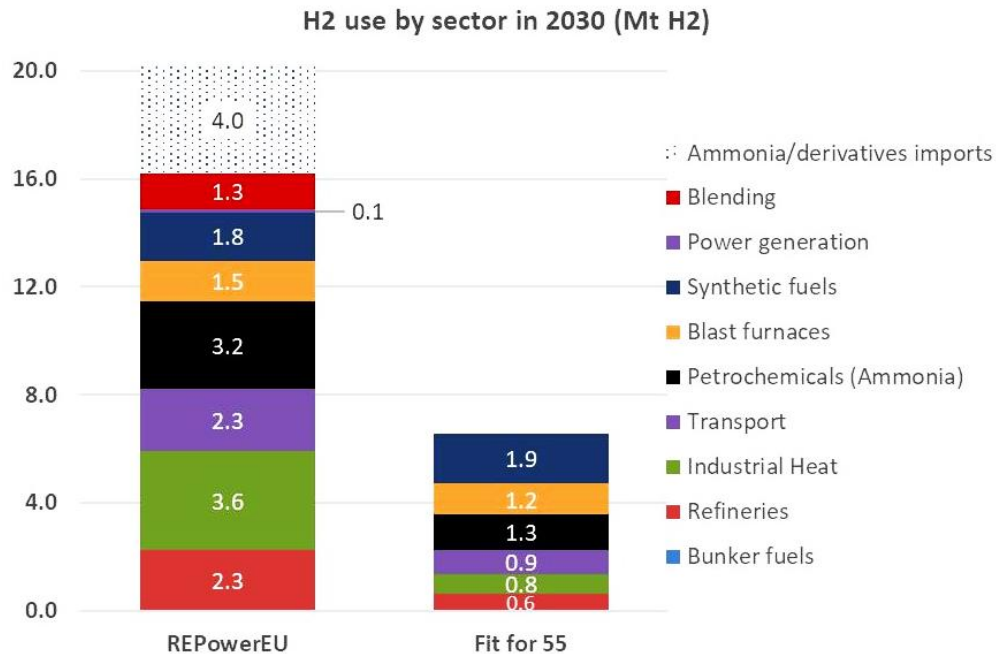
Crucial point: match the grid needs about power flux direction and

- the users' needs/habits,
- the randomness of the availability (in time and space) of the EV storage units and
- the state of charge of the vehicles and the capacity availability.

Hydrogen for mobility: strengths and weaknesses

Coherently with RePowerEU plan, the RED III Directive aims to increase the **share of renewable fuels of non-biologic origin** (including hydrogen) with new targets by 2030 in each sector.

Italian PNRR has funded projects with over 3 billion€, with particular emphasis on hydrogen valleys, hard-to-abate (HTA) sectors and transport.



The main pros of hydrogen for mobility are:

- Refueling time.
- Long driving range.
- Lightness of modules.

... but all that glitters is not gold:

- Reduced energy efficiency.
- Costs of hydrogen value chain.
- Not fully mature supply chain.

Source:

European Commission – Implementing the RePowerEU Action Plan: investment needs, hydrogen accelerator and achieving the biomethane targets (SWD/2022/230)

Grazie per l'attenzione
Thanks for your attention



Iren S.p.A.

Reggio Emilia | Via Nubi di Magellano, 30 - 42123

Torino | Corso Svizzera, 95 - 10143

Genova | Via SS. Giacomo e Filippo, 7 - 16122

Parma | Strada S. Margherita, 6/A - 43123

Piacenza | Strada Borgoforte, 22 - 29122

innovazione@gruppoiren.it