

Infinite Energy Project

Shortages and accidents in the power grid



These are companies founded by Ukrainians in the United States.
And all team members are Ukrainians.

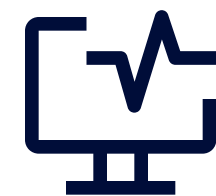
The main goal is to improve and support Ukraine's charging
infrastructure.

The main activity of our company is aimed at creating a reliable and efficient infrastructure of charging stations for electric vehicles, which contributes to the sustainable development of electric vehicles in Ukraine.



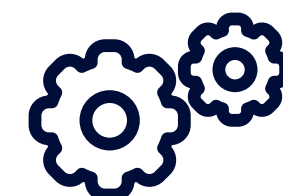
Consultations and technical support

Our team of experts is happy to provide advice on choosing the optimal configuration of charging stations and their reliability. We are ready to answer all your questions and provide technical support at any stage of cooperation.



Monitoring and analytics

Monitoring stations allows us to quickly identify and fix problems, ensuring stable and uninterrupted operation of the system. We also collect technical data and provide analytics on the use of charging stations to optimize their efficiency.



Installation and integration

Our qualified specialists are engaged in the professional installation of charging stations and their integration with the existing infrastructure. We are confident that each stage of the installation is performed in compliance with high quality standards.



User support system

We strive to ensure maximum comfort for our station users. That is why we offer a convenient support system where you can ask any questions and receive prompt answers and assistance.

Our services

We are engaged in updating and maintaining the existing charging stations in Ukraine. To do this, we carry out the following work:

Software updates

We update the firmware of the charging stations, adding new features and fixing bugs in the operation of the charging stations.

Modernization of charging stations

To improve performance and expand capabilities, we install additional modules at the station, such as additional connectors, screens, silencers, etc.

Replacement of charging station components

In the event of a breakdown or the need to replace old modules with more modern ones, our company carries out all the necessary work.

Relocation of charging stations

If the charging station's profitability does not suit the owner, we can move it to another location with a higher car traffic.

Infinite Energy - a powerful charging station with V2G system and powerbank

We are developing a charging station that will have:

It will have its own "Powerbank", which will be able to accumulate all the free power of the location, and then use the accumulated energy to charge cars.

It will work as a backup power source for the location in the absence of centralized power supply.

It will supply electricity to the grid from connected cars in case of blackout.

Permissible input power:

30/60/90/120/150/180/
210/240/270/300 kW

Power output options in Powerbank mode:

30/60/90/120/150/180/
210/240/270/300 kW

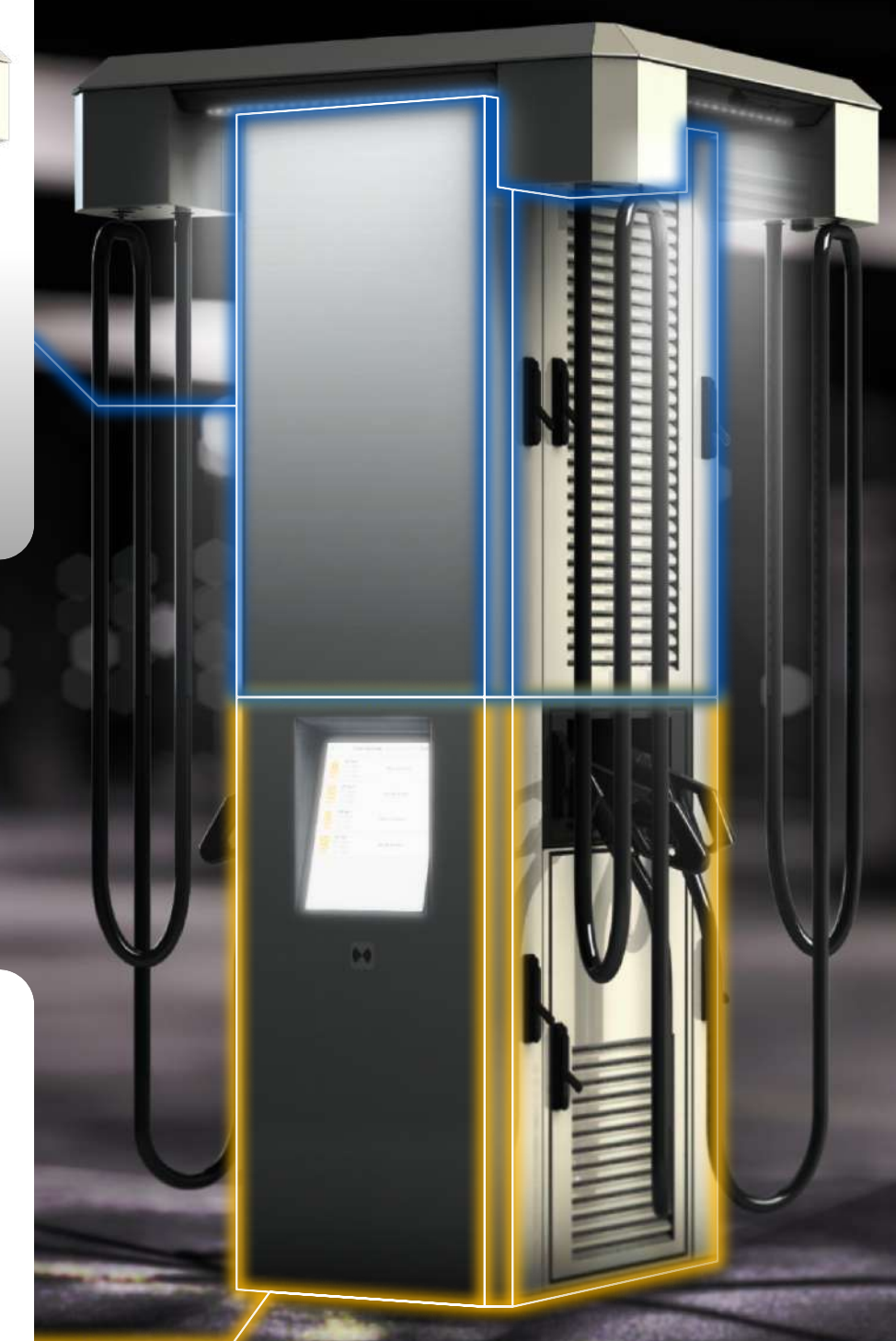
Maximum car charging power:

600 kW

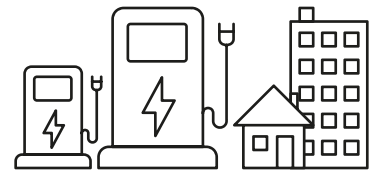
Power unit of the station



"Powerbank" of the charging station



EMS AC controller for dynamic power distribution at the location



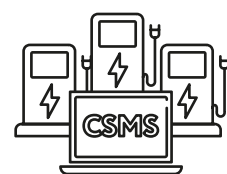
Power distribution

The EMS AC Controller measures the available power that can be used to charge electric vehicles and transfers it to the charging satnav/stations.



Power reserve

For stable operation, the hub needs twice as much power as the most powerful electrical appliance at the location.



Communication with CSMS

To improve management and ease of charging hub configuration, each charging station has access to our CSMS via the Internet.

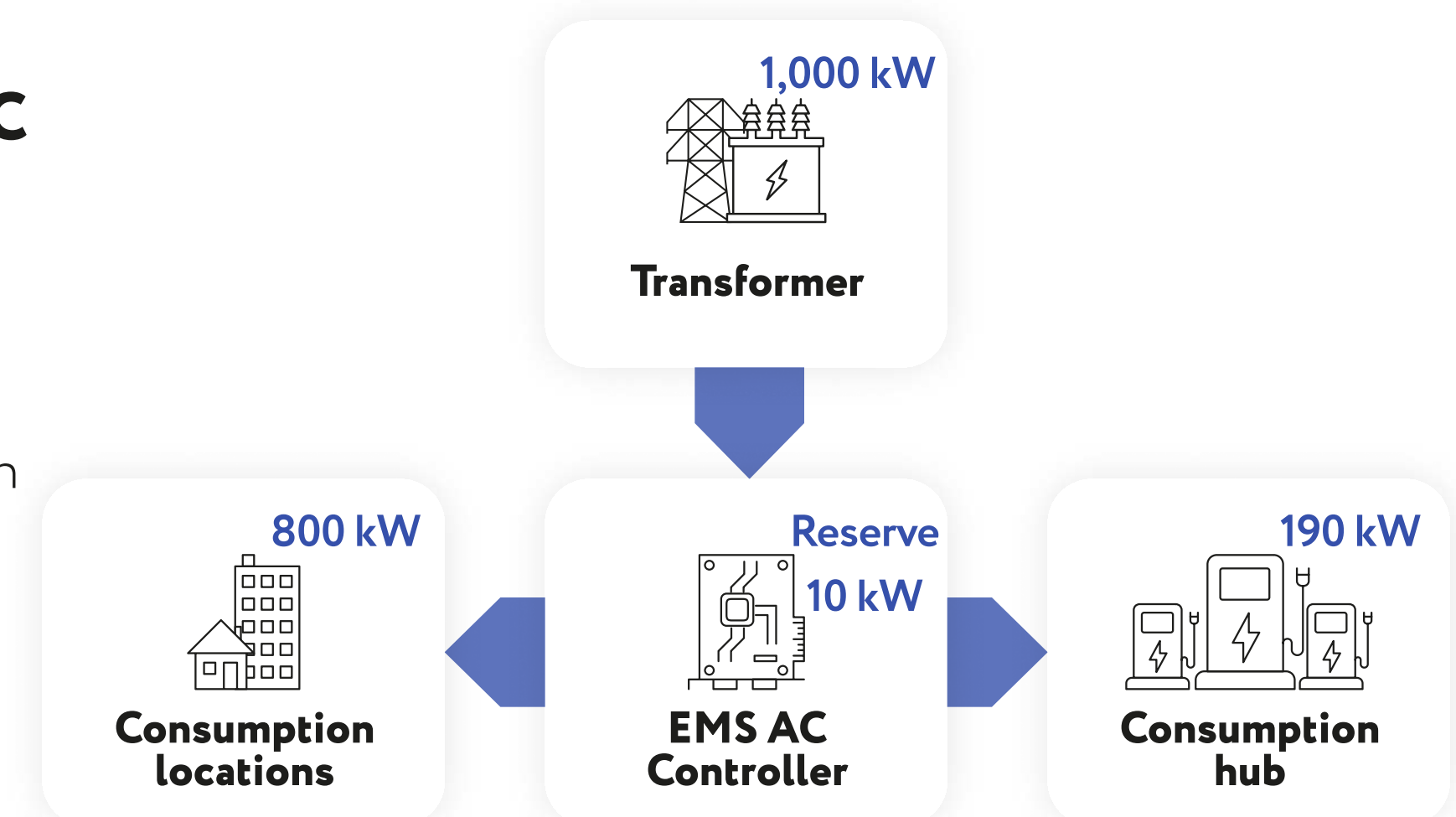
Storage and power doubling:

With the EMS AC controller, we can actually take the free power at the location and return it as needed, for example:

Taking **300 kW / 30 kW** of free power, we will give **300 kW / 30 kW**, if necessary, or actually **double** to **600 kW / 60 kW** the power of the location if necessary.

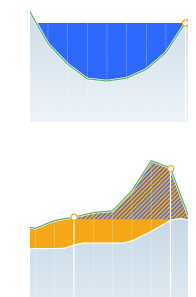
To demonstrate the logic of the EMS AC Controller, let's look at the following example:

- The location has **1,000 kW** of input power;
- The controller measures the current consumption of the location (for example, **800 kW**);
- The difference of **200 kW**, minus the reserved power, is distributed among the charging stations of the location hub.

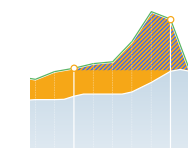


The problem and methods of its solution

After the start of the full-scale invasion, due to the terrorist actions of the Russian federated forces, energy infrastructure facilities in Ukraine were damaged, creating a crisis situation:

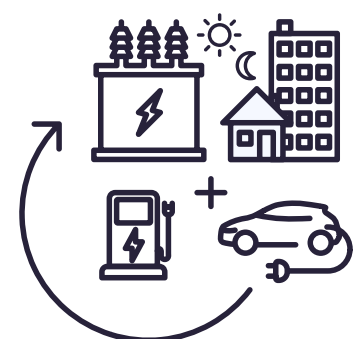


1. Nighttime underloading of the network;



2. Peak network overload.

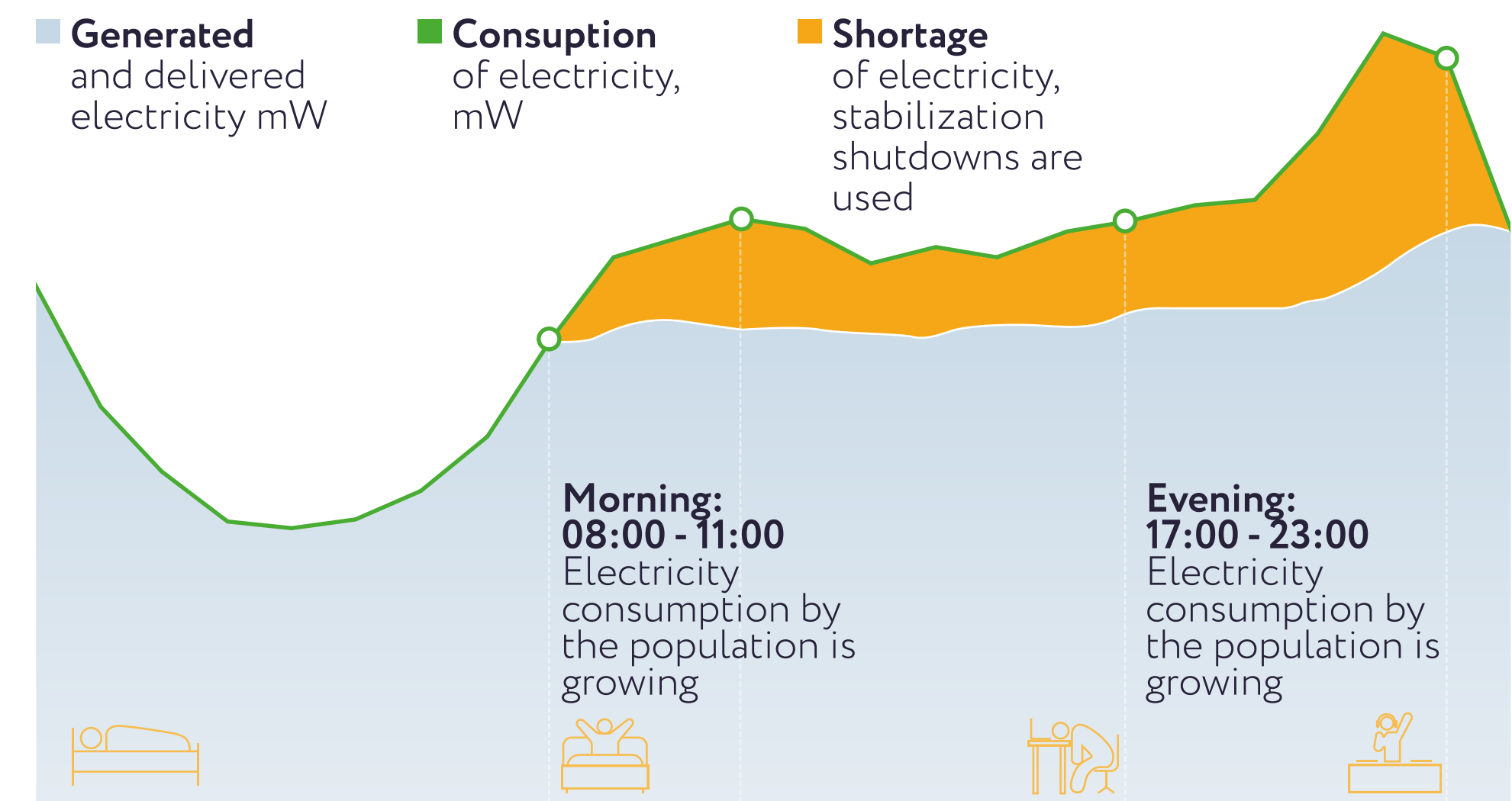
Our company has a proposal to solve the problem of network stabilization:



Implement a mode of bi-directional operation of charging stations for electric cars (V2G), which will allow electric cars to supply electricity to the grid.

WHY ARE THERE STABILIZATION OUTAGES OCCUR

Production, delivery and consumption of electricity during the day



Due to damage to energy infrastructure facilities, the capacity of the grid has significantly decreased. As a result, there is a shortage of electricity, and stabilization blackouts are used to reduce it.

Sources: Ukrenergo, YASNO

Yasno

Adjustment of electricity consumption by charging stations

Statistics

According to Yasno's statistics, the peak load on the power grid occurs between 8:00 and 00:00.

The decrease in electricity consumption to the normal level occurs between 00:00 and 08:00.

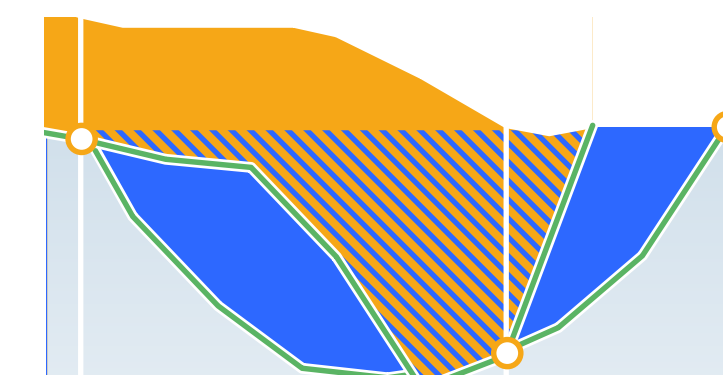
Such indicators are due to the working schedule and the need for household chores.

Our observations

According to our observations, most electric car owners leave their cars to charge at night if there is a charging station in the neighborhood. This is convenient for the owners and ensures consumption during off-peak hours. It also reduces the load on the infrastructure of high-speed public charging stations, which are used mainly during hours when there is already a shortage of electricity.

Solution to the problem

The energy received by electric cars at night can be used during peak hours to reduce electricity shortages.



To encourage electric motorists to share the remaining charge of electric cars, you can return 2 kW from 24:00-08:00 for every 1 kW they give to the grid from 17:00-24:00.

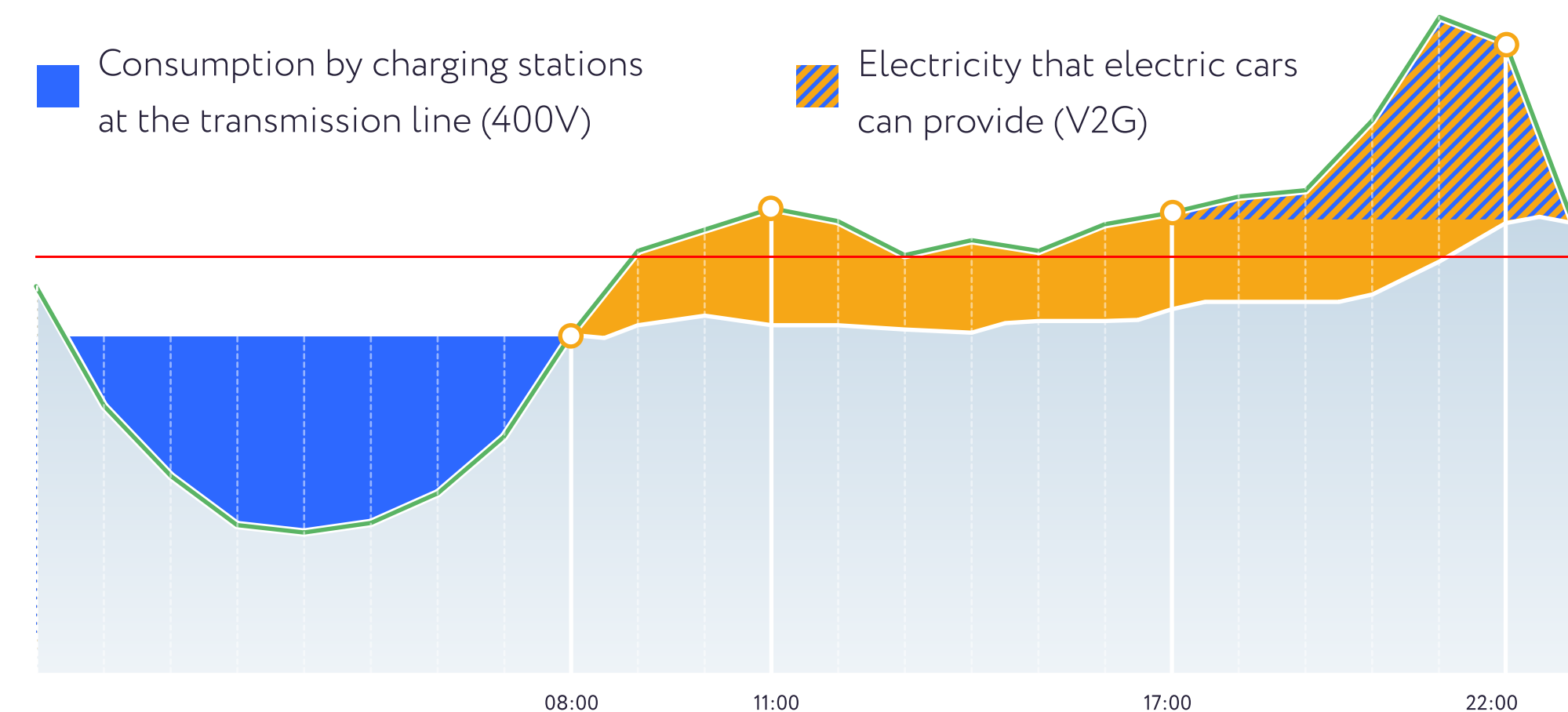
Electricity generated

Deficit without adjustment

Consumption without adjustment

Consumption by charging stations at the transmission line (400V)

Electricity that electric cars can provide (V2G)



Modernization of charging stations for transferring electricity from cars to the grid

V2G is a type of bi-directional charging station operation that allows charging stations to charge cars at one time and use them as an additional source of power to the grid at another. Given the number of electric cars in Ukraine, this type of charging station operation is a great alternative to stabilization power outages.

 **50,000+**

Electric cars actively using public charging stations

 **30 kW**

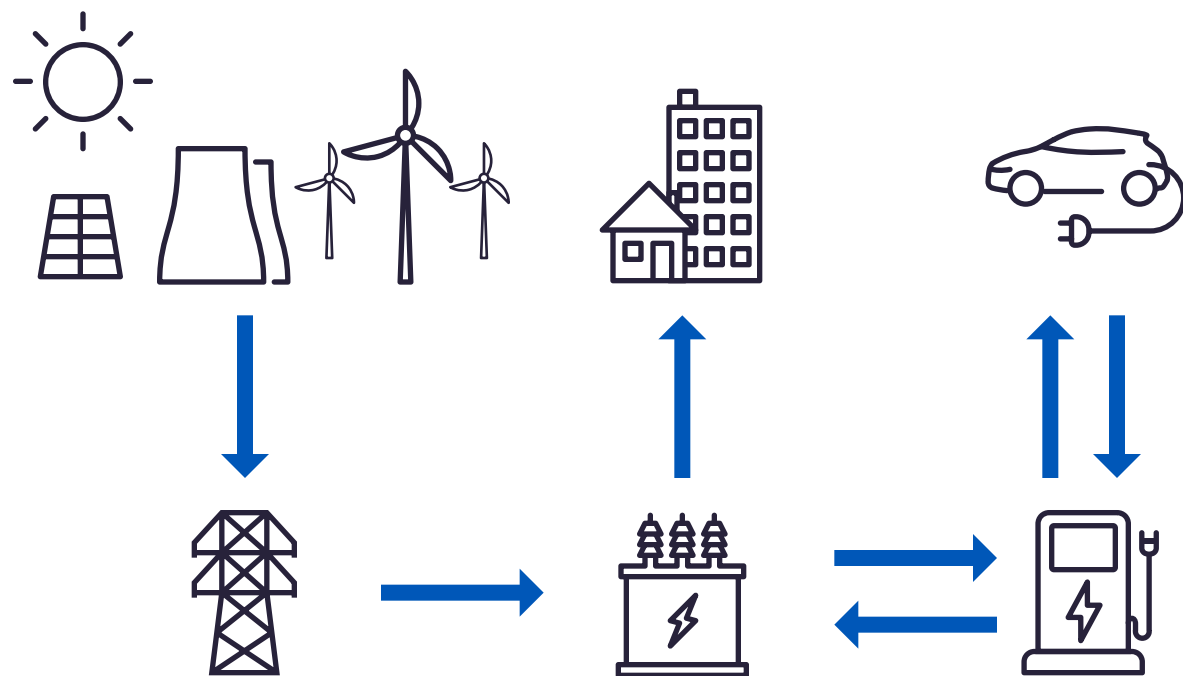
Average daily energy balance in an electric car

 **1.5M kW**

The potential power that can be obtained from electric cars

How it works

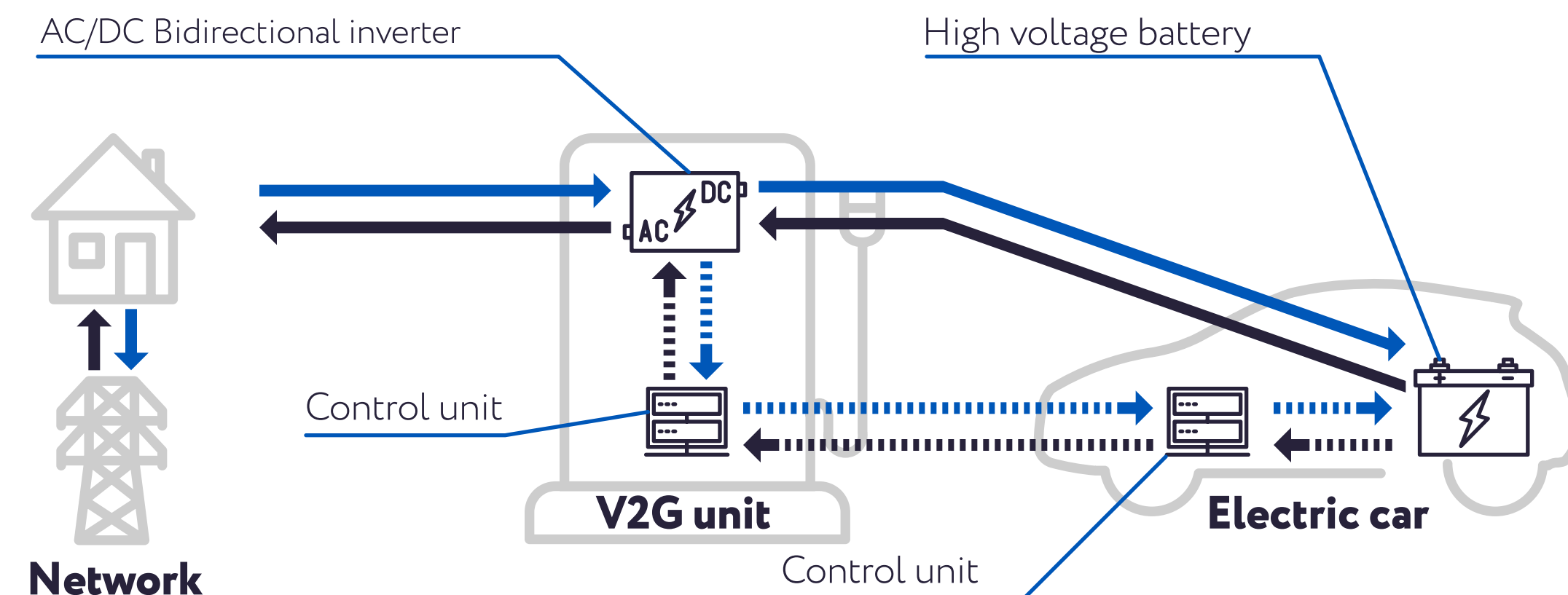
When the grid is underloaded, we stabilize electricity consumption by charging electric cars. And when there is a peak deficit, electric cars will cover it from the remaining unused energy.



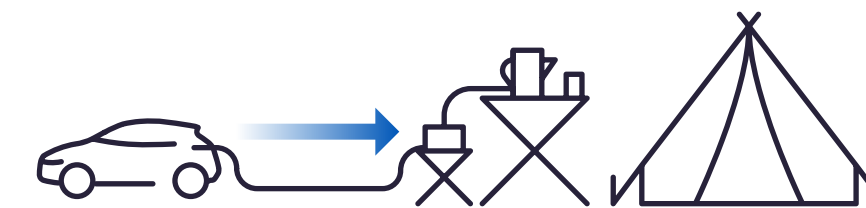
How electricity is exchanged and what other types of exchange are available

How the V2G system works

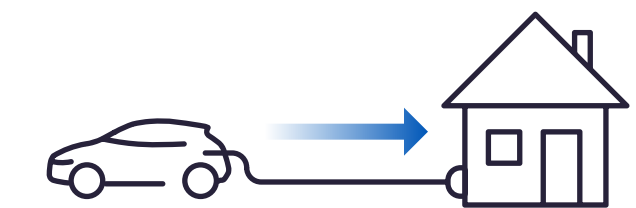
V2G technology requires bi-directional charging, which regulates the power transmission in both directions by measuring the current frequency in the network. To measure it, a controller is used, which transmits the received information to the charging station via a special connection. After receiving the information, the charging station starts to operate in the standard car charging mode or switches to the reverse mode, taking "extra" energy from the electric car.



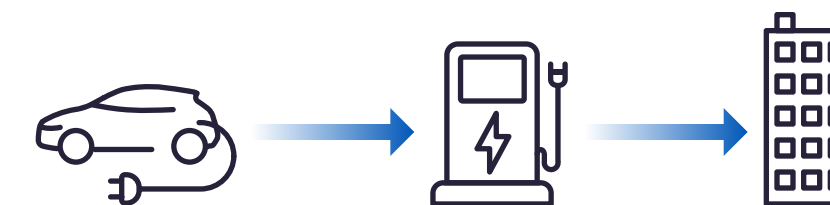
Types of use of the bidirectional charging protocol



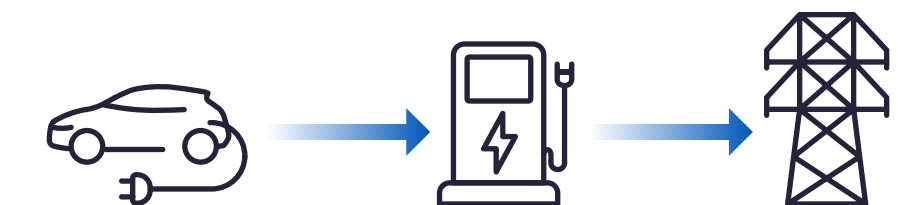
V2L (Vehicle to load) to provide electricity to campsites and construction sites.



V2H (Vehicle to home) to optimize energy management at home.

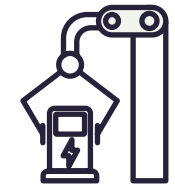


V2B (Vehicle to building) is the same as V2H for office/collective housing buildings.



V2G (Vehicle to grid) to provide advanced network services, usually through an aggregator.

What is needed to implement a V2G system on the basis of already installed radio facilities



Modernization of charging stations

In order for our charging stations to operate in V2G mode, we need to modernize them by adding a converter from direct to alternating current.



Software updates

To implement the mode of automatic capacity adjustment of charging stations, we need to update the software to adjust this parameter.



Funding for the modernization of charging stations

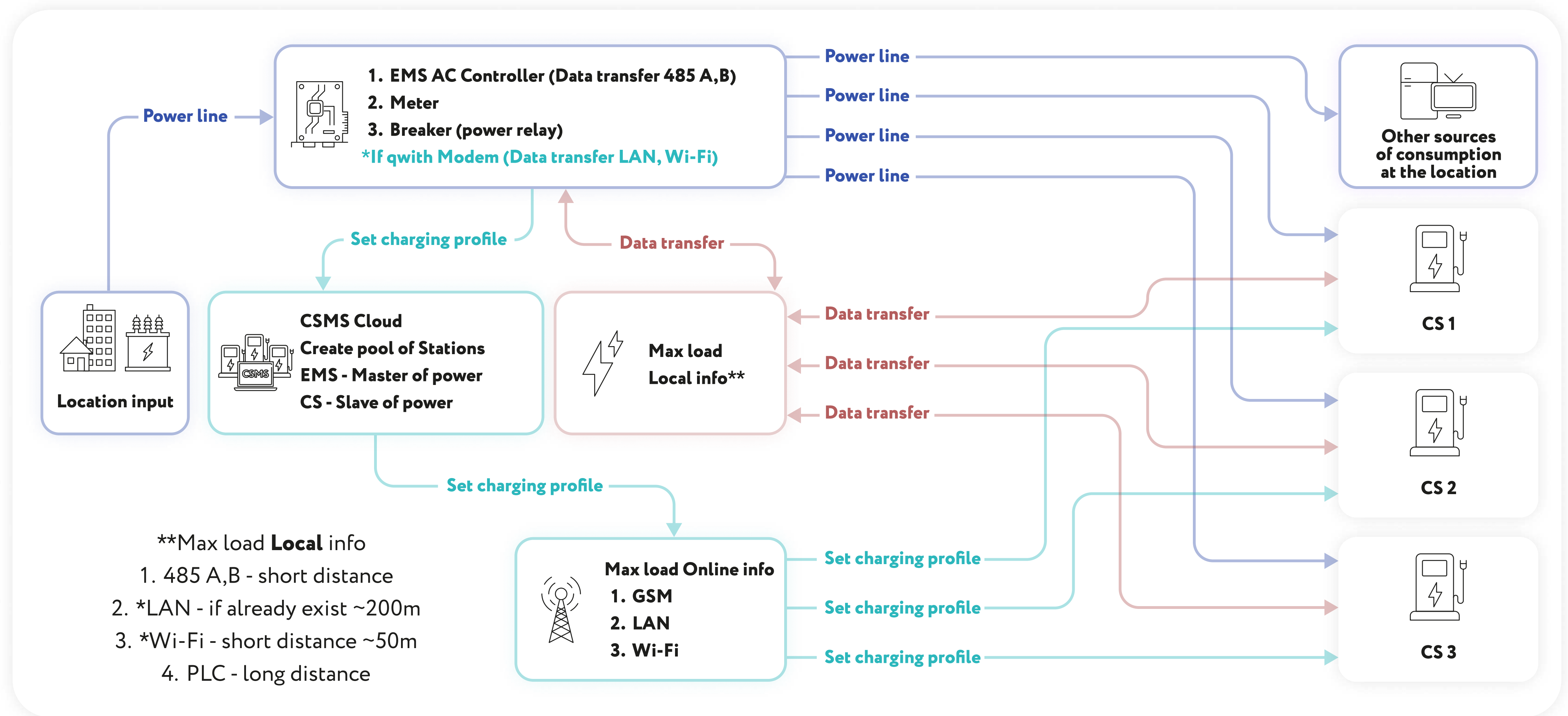
The cost of retrofitting a V2G station is \$1,500 for every 30 kWh of power.
 $\$1,500 \times 1,000 \text{ charging stations} = \$1,500,000$



Term and result

Estimated completion period is 6 months. The total V2G capacity is 30,000 kWh.

Scheme of EMS operation



► Data transfer

▶ Power line (Local work)

► Set charging profile (Network settings)