SOFTWARE MANAGEMENT OF ENERGY RESOURCES

Innovative energy efficiency solution for electricity consumers and producers:

SMARTELECTROSYSTEM.COM



Who are we?

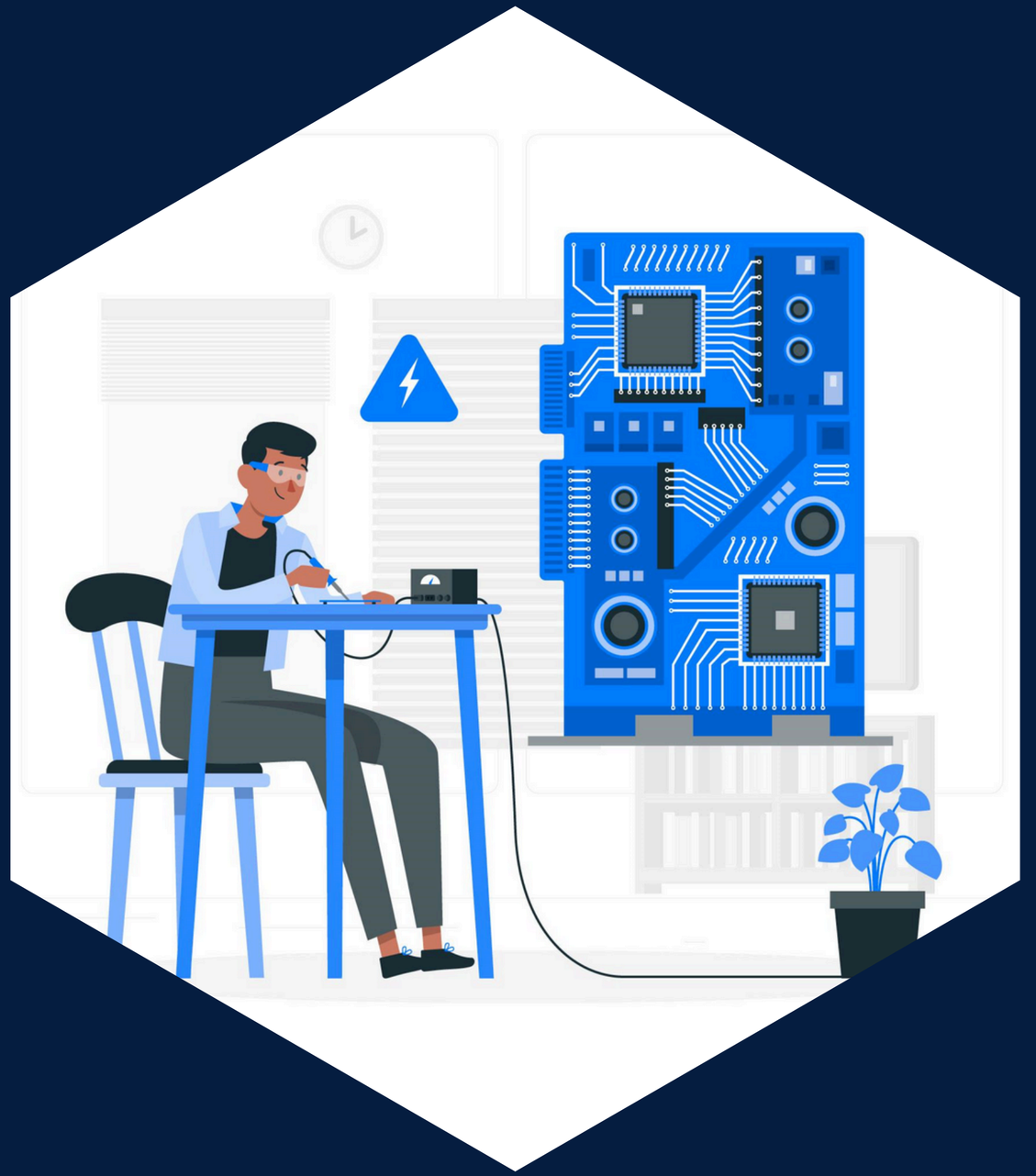
- Smart Electro System is a software created by an innovative company specializing in the development of intelligent and environmentally friendly energy solutions for home and business.
- By automating the management of electricity consumption and sales according to exchange prices, our software reduces electricity costs and increases revenues from the sale of electricity.



Introduction and Context

Main functions of https://smartelectrosystem.com

- Boiler System Management
- Battery Management
- Charging Station Management
- Photovoltaic Installation Management
- Balancing
- Monitoring



SOFTWARE CONTROL OF BOILER SYSTEMS

As you know, the prices of energy exchanges are different for every hour of the day, and within the day the difference between the minimum and maximum price can vary by up to 10, 100, or more times, and it is not uncommon for prices to be close to 0 or even negative.

Consumers such as electric water heaters, which in most facilities are the main consumer of electricity, have the ability to store energy and our software manages them according to the exchange prices.

Thus, your electric water heaters become batteries with extremely high capacity, which are "charged" at the lowest prices on the exchange, while consumption - for example, in the morning or evening hours would cost many times more.



Software control of boiler systems

What do I need to do to convert my hot water boiler system into a "Smart" battery?

In order for our software to manage your boiler system according to the exchange prices of electricity, it is necessary:

1) To register on our platform: https://smartelectrosystem.com

2) To order "smart" devices through our website for each of the boilers that you want to manage. Our software works with some of the largest manufacturers of "smart" devices such as: https://shelly.com, https://prosmartsystem.com, etc.

3) Make the desired settings in our software and install the devices.

You can download the user manual from this link: User_manual_smartelectrosystem.pdf

We will assist you with every step that needs to be done.





Software control of boiler systems

How much can I save by using https://smartelectrosystem.com ?

The amount you can save by using our software to manage your boiler system depends mainly on your hot water consumption, as well as on the configuration of your system (capacity of boilers, power of heaters, presence of Photovoltaic, Solar installation, etc.).

On average, on an annual basis, you can reduce your hot water costs by 2-3 times, and it is possible that there will be months with a negative hot water bill if you have a photovoltaic installation and the electricity consumed is mainly excess electricity from the photovoltaic installation, which you would sell at a negative price.

Through our software, you can absorb up to 100% cheap electricity, whether from the power grid or another source.

For example, a hotel with 300 beds on an annual basis and good occupancy with an average difference on the exchange between the minimum and maximum price of 100 EUR/MW can save up to 30,000 EUR per year.



BATTERY MANAGEMENT SOFTWARE

How does "Smart" Battery management work: https://smartelectrosystem.com/

- Our software automatically extracts the exchange prices of electricity a day ahead.
- This makes it possible to determine in advance the optimal price for charging your battery, as well as to determine the optimal discharge period.
- The software monitors in real time and makes a forecast for the electricity produced by your photovoltaic installation, as well as makes a forecast for the current produced based on the meteorological conditions for the next day.
- The software automatically monitors your consumption and, based on accumulated data and self-learning of the software using artificial intelligence, makes a forecast for future consumption in your facility.
- Based on the collected data, the software calculates at what time the Battery should absorb the excess cheap current from your photovoltaic installation, at what time it should cover your own consumption and at what time it should sell electricity, and if the price is not favorable for charging or discharging, the software does not allow the battery to operate at a loss, which would result in additional costs for you.

The software calculates losses during charging and discharging and prevents the battery from being used up in a cycle for which the costs would be greater than the amount saved.

BATTERY MANAGEMENT SOFTWARE

How do we determine what battery capacity is most optimal for our site?

The optimal capacity of your battery depends on:

- Your consumption
- Whether you have the right to sell electricity
- Whether you have the right to discharge the battery into the grid
- The capacity of your photovoltaic installation or the capacity of your own transformer substation (if you have one)

If you want to achieve optimal results from using a battery, the capacity should be at least twice as large as your allowed discharge rate into the grid.

If you are not sure - we will advise you completely free of charge

Battery management software

Common Mistakes in Using Batteries

1) The most common mistake when buying a battery is that the manufacturer of the model you have chosen does not offer an open API for it so that the battery can be managed according to market electricity prices.

2) Due to the lack of software to manage your battery, the most commonly used mode is: “Maximum self-consumption”, which absorbs excess electricity from your photovoltaic installation and when you do not produce electricity, the battery covers your consumption.

What are the disadvantages of this management mode:

When you do not have enough produced current - the battery is not charged to the maximum or is not charged at all if your consumption exceeds the produced current

Very often in the morning hours, when you produce electricity, the price on the exchange is high and instead of selling this electricity at a high price, you use it to charge the battery

- Usually, your battery is charged for a few hours when you have enough excess current from the photovoltaic installation and when the exchange prices have become close to zero or negative, you no longer have free space in the battery.
- The effect of this is that you have charged the battery with expensive electricity, and then your photovoltaic installation starts selling electricity at a negative price.
- In the evening hours before sunset, when you no longer produce enough electricity, your battery starts to discharge, but just a few hours later, the prices on the exchange may be many times higher and you no longer have enough electricity in the battery to cover your consumption exactly when the prices are highest.
- In the event that you have not had much consumption, the battery continues to discharge even in the wee hours when the price of electricity may be lower and very often it turns out that you have charged the battery at a higher price than the price at which you discharge it.
- Very often, the consumption that covers the battery as a value is less than the depreciation of the battery.
- What is the solution to these problems?
- If you want to get the most out of your battery - charge from the grid and sell the excess battery energy at the highest price on the exchange and charge at the lowest price of the day.
- Our software offers fully automated management, achieving optimal results relative to the exchange prices.

Battery management software

How can we make our electricity bill negative?

What does a negative electricity bill mean?

When you have sold electricity for a greater amount than you bought electricity from the grid – in reality you pay less than you receive. So, if your expenses and income are invoiced to one account, in reality you have to receive money without paying or, if they are on separate accounts, you pay less than you receive from the electricity sold.

Is this possible if the consumption is greater than the possibility of selling electricity?

- Yes – of course. You can sell, for example, 500 KW per month for a greater amount than the 2000 KW that you used from the grid.

- If your facility, for example, operates seasonally – even if you have a photovoltaic installation and battery, but you have no off-season consumption – you are not really using their full potential.
- In this case, the solution is to optimally use your installation and battery and buy electricity at the lowest price and sell it when the price is highest.
- So off-season you can have more income from sold electricity than your bill will be during the active season.
- In case you have the right to sell at a much higher rate compared to your consumption, you can safely generate a negative electricity bill





CHARGING STATION MANAGEMENT

- If you have a charging station for electric cars, you can dynamically and in real time update the charging price according to the electricity exchange prices through our software.
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- Why is this necessary?
- Sometimes the price of electricity on the exchange is over 1000, and sometimes over 2000 BGN/MW
- In case you use a static charging price, for example 0.69 BGN/KW with VAT (575 BGN/MW) - for example with a fast charging station in just a few hours you can generate huge losses of the order of 1000 BGN and more.
- On the other hand, if your charging price is the same as all the surrounding places or higher, then the probability that someone will choose your charging station is not high, but if the price on the exchange is low - you can very easily attract customers and generate profit for your site by reducing the price, while guaranteeing high levels of profit with a 100, 200 and more percent markup and yet a lower price.
- Exchange prices are very often close to 0 BGN and this makes it possible to offer the service at a low price and with a large markup.
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- How do I add a high-power charging station to my site, when I do not have enough allocated power?
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- The solution is very simple - our software regulates in real time the allocated power of the charging station according to the current consumption in the site and allocates as much power as is available.

All this is managed through the settings of our software.

SOFTWARE MANAGEMENT OF Photovoltaic Installations

- For owners of photovoltaic installations, an increasingly common issue is the suspension of electricity sales when the exchange is close to 0.
- Why is this necessary and why is it important?
- When the exchange price is 0 or close to zero, in reality with the charging of Commissions by the Balancing Group, which buys the electricity, Transmission from the Electricity Distribution Company - the price becomes Negative, apart from that, the Balancing Price in some months can exceed 50 - 60 BGN per MW. Because of these costs, it may turn out that for the electricity you sell you owe up to 100 BGN/MW.
- A negative selling price is increasingly common and more and more days of the year due to the drastic increase in photovoltaic installations. In case the photovoltaic installation is mainly for the sale of electricity, it is possible for whole months to have less income than expenses. The only solution to this problem is to stop the sale of electricity at a negative price.
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- Our software offers such functionality for some of the Inverter models, but before resorting to this solution, our advice is to think about resolving this issue by adding batteries, because just a few hours after the negative price, the price may be extremely high and you can use this electricity instead of generating losses to bring you a very good profit
- Our software, in the presence of Batteries or Boiler systems, absorbs up to 100% of the current at a negative price.





BALANCING

One of the main problems of all electricity producers and entities that sell electricity is the balancing bill they receive every month for the electricity sold (the so-called imbalance).
How can you solve this problem with our software?

- In order not to be charged a balancing price - you must send a daily hourly schedule for the electricity you will sell.
- Our software automatically calculates and sends to the balancing group a schedule for the electricity sold. And it automatically follows the schedule in a way that minimizes balancing costs.
- Very often, without sending such a schedule, you will have very high balancing costs, as some of the months may exceed the entire amount for the electricity sold, but also very often an electricity trader will refuse to buy your electricity without such a schedule.
- By sending a schedule, the software synchronizes the data between your facility and the balancing group, so they can predict with great accuracy exactly how much electricity they need to purchase from the exchange without this leading to additional imbalance costs for them and, accordingly, for you.
- With the software settings, you can set the priority of covering your own consumption over selling electricity.
- In this way, the higher the price per MW they charge you for balancing, the lower the amount you pay if you use our battery or boiler system management.



MONITORING

- With our software, you have constant remote monitoring of your energy system from a laptop, phone or tablet without having to be physically present at your site.
- According to your configuration, the system sends the following types of notifications by email:
- Internet connection interruption.
- Stoppage due to damage to your photovoltaic installation.
- Stoppage due to damage to your Battery.
- Reaching a temperature of your boiler system below the minimum set.
- Forgotten electrical appliance turned on.
- Heater failure.
- Damage to any of the Wi-Fi controllers you use.
- Damage to any of the temperature sensors you use for your boiler system.
- Damage to an electric vehicle charging station that you manage through our software.
- And many more
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Notifications are sent in addition to the email you registered with and to the additional email if you have entered it in the System Settings of the software.

Register at https://smartelectrosystem.com

and reduce your electricity costs.

To contact us:

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