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Increasing the competitiveness and sustainability of enterprises

through the implementation of renewable energy sources and automated systems

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PROMAVTOMATYKA

Promavtomatyka Vinnytsia

- Hardware production, sevices of electrical installation, solar&wind generation
- 20+ years, 10+ business units, 400+ employees
- 100+ projects in cooperation with local governments
- Critical infrastructure company: street lighting, maintaining the smooth operation of petrol stations, selling and installing power generators, installing solar power stations for state and municipal institutions

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Anton Kaspirovych

- CEO Promavtomatyka Vinnytsia
- have worked with businesses in Ukraine, Russia, Kazakhstan, Uzbekistan and the Czech Republic
- accredited expert on organizational development at the European Bank for Reconstruction and Development
- have 1000+ hours of public speaking experience and 150+ pages of publications in the field of business management
- have had a few cooperation projects with Government at the level of Ministries in the Ukraine (Ministry of Education) and Uzbekistan (Ministry of Transport)

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Agenda

- The role of electricity as one of the key resources for the competitiveness of manufacturing enterprises
- Problems of using of renewable energy sources
- How it can be solved and what a role of Government in this challenge
- Q&A session
- Calculation of the payback for the transition to renewable energy sources
- Case Study

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1

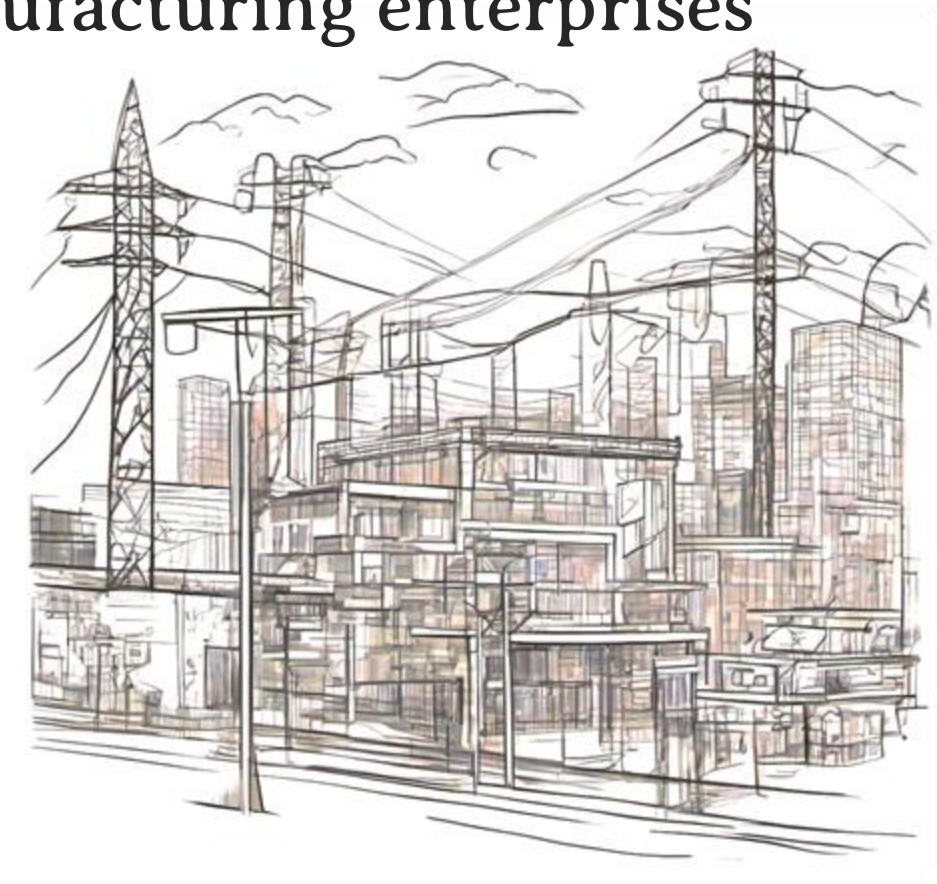
The role of electricity as one of the key resources for the competitiveness of manufacturing enterprises

Cost of electricity

Impact on GDP

How it works

Green transition



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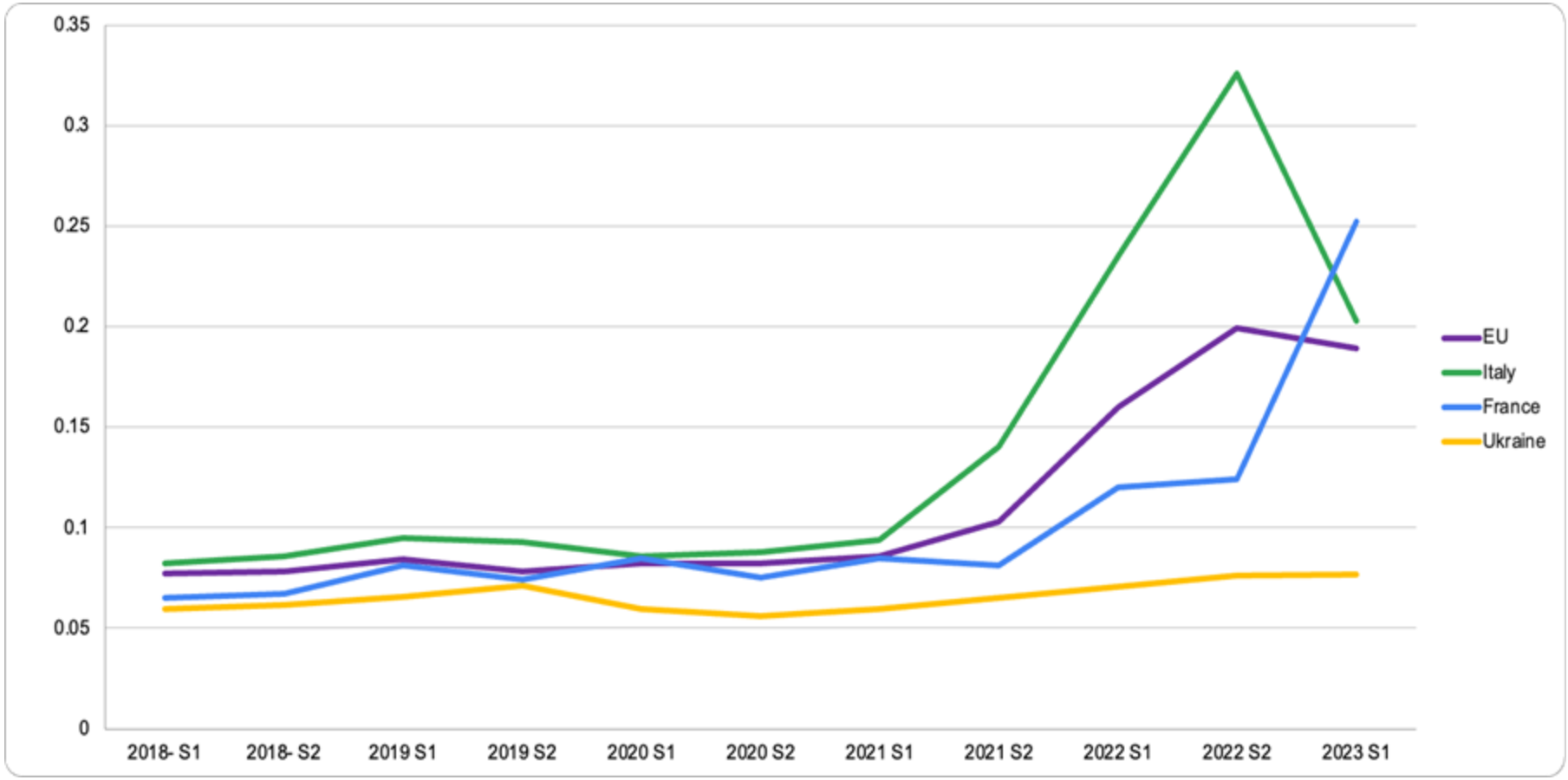
Cost of electricity, euro



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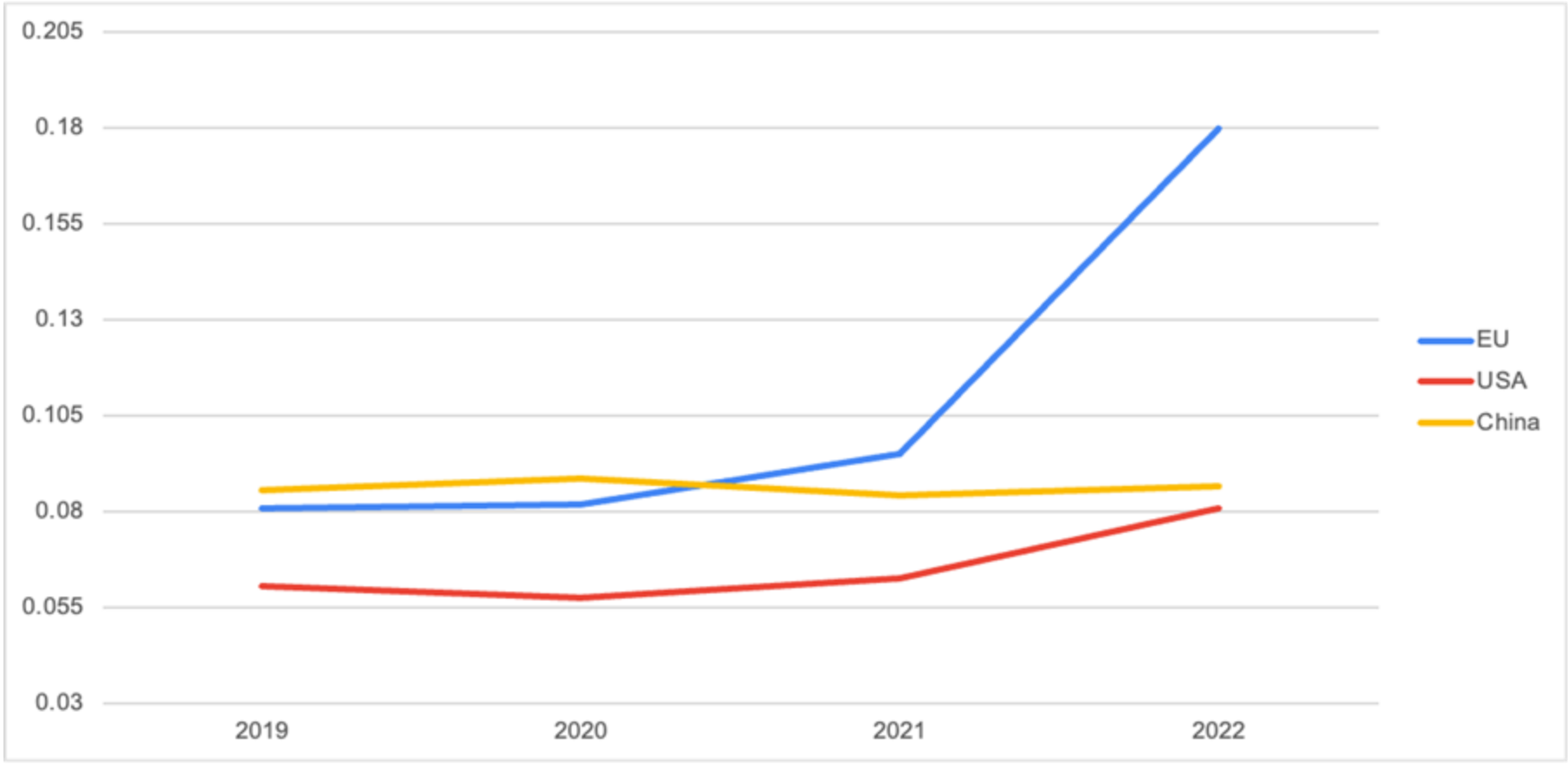
Cost of electricity 2018-2022, euro



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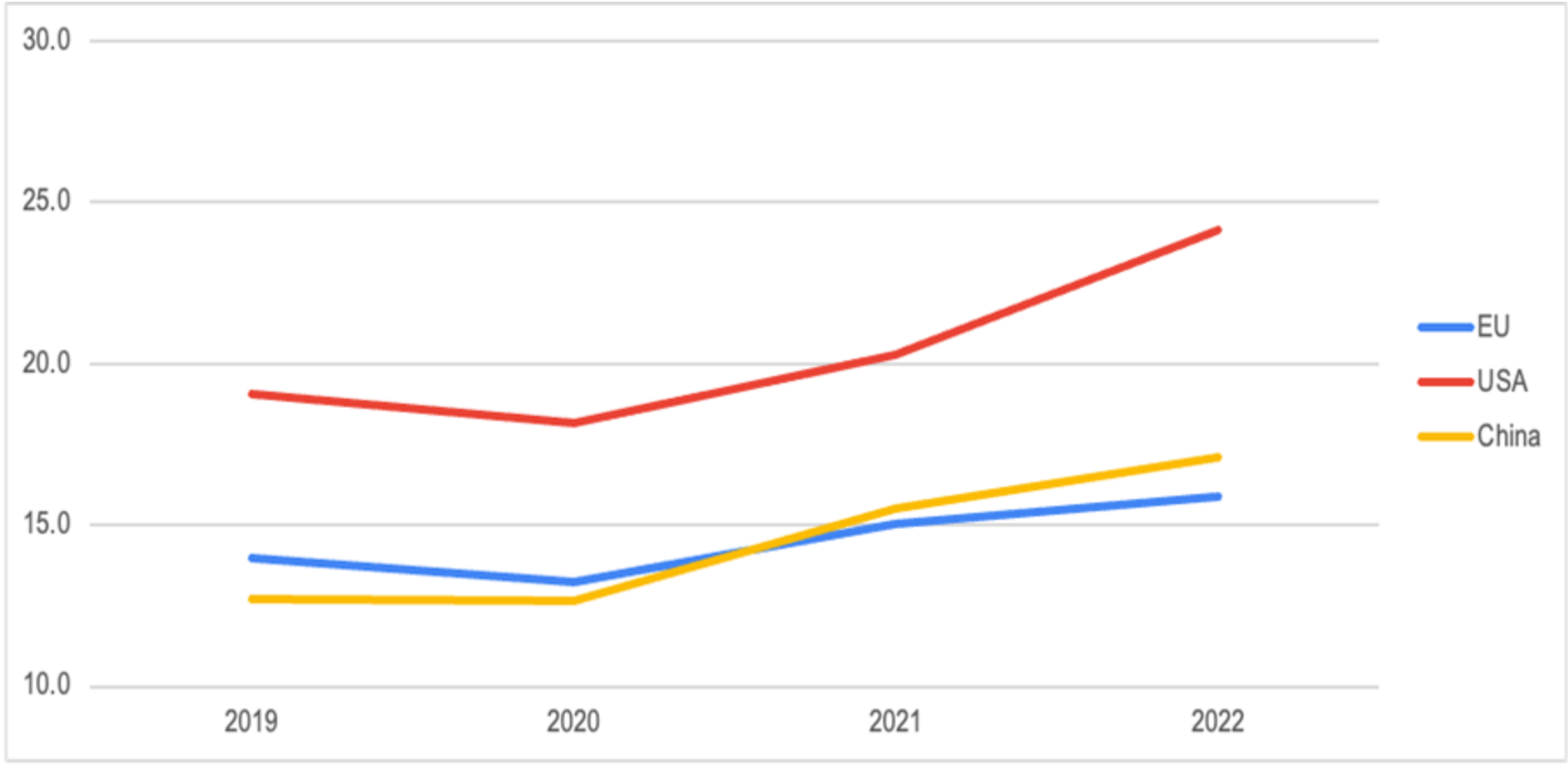
GDP 2018-2022, bl euro

a 10% increase in electricity prices reduced the value of exports by an average 1.9%



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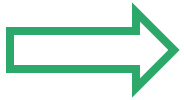
How it works

Energy price increase



Business:

a) absorption
b) substitution
c) energy efficiency

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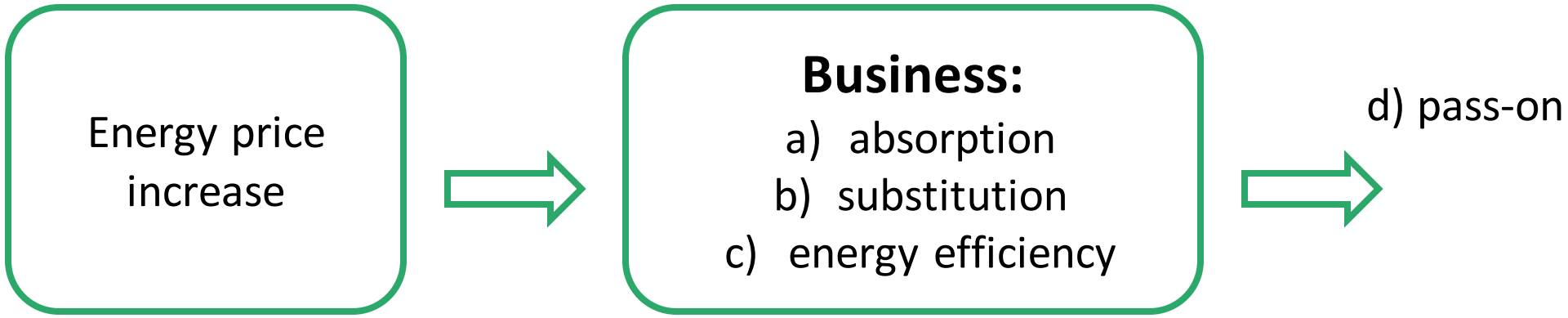
How it works



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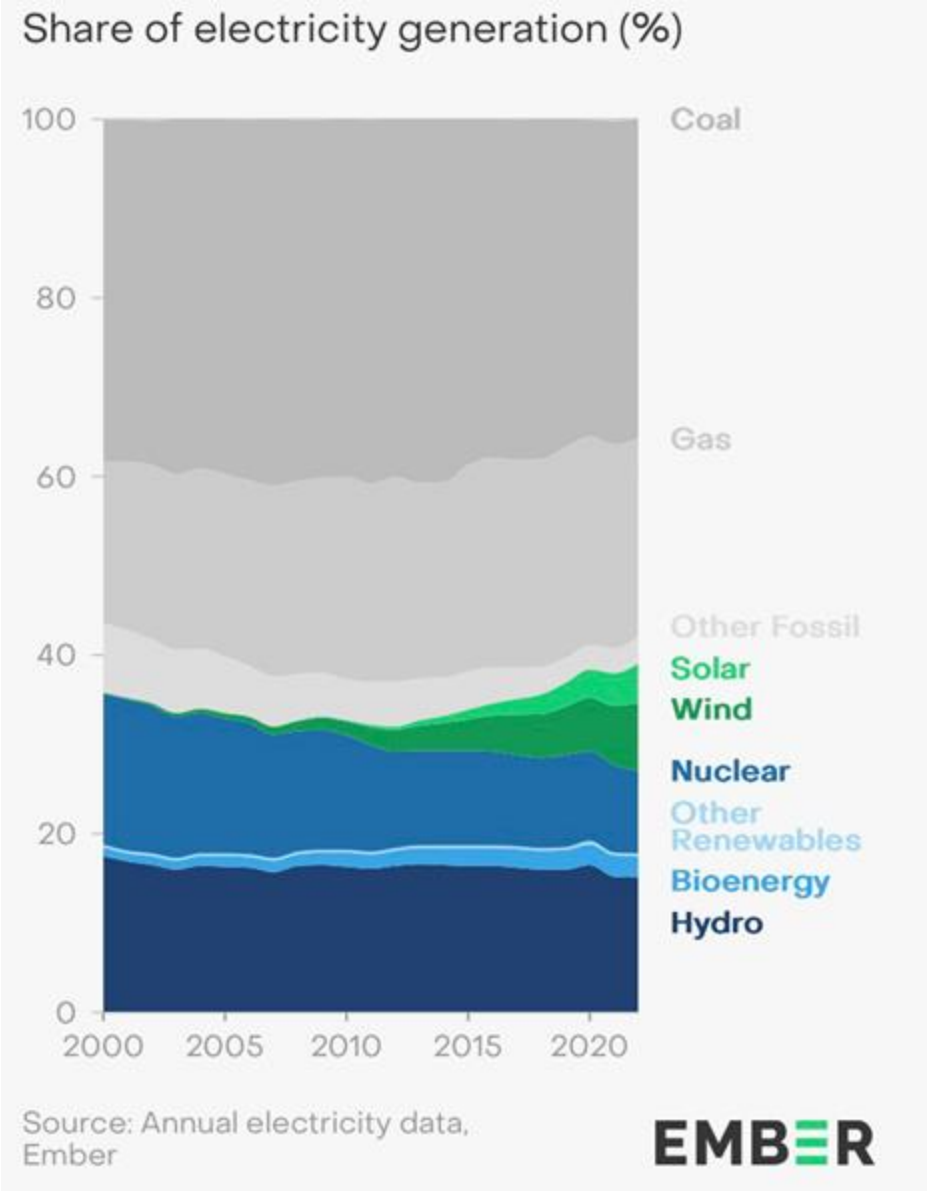
Substitution

Wind and Solar grow to 12% of global power - pushing up the share of clean electricity to almost 40%



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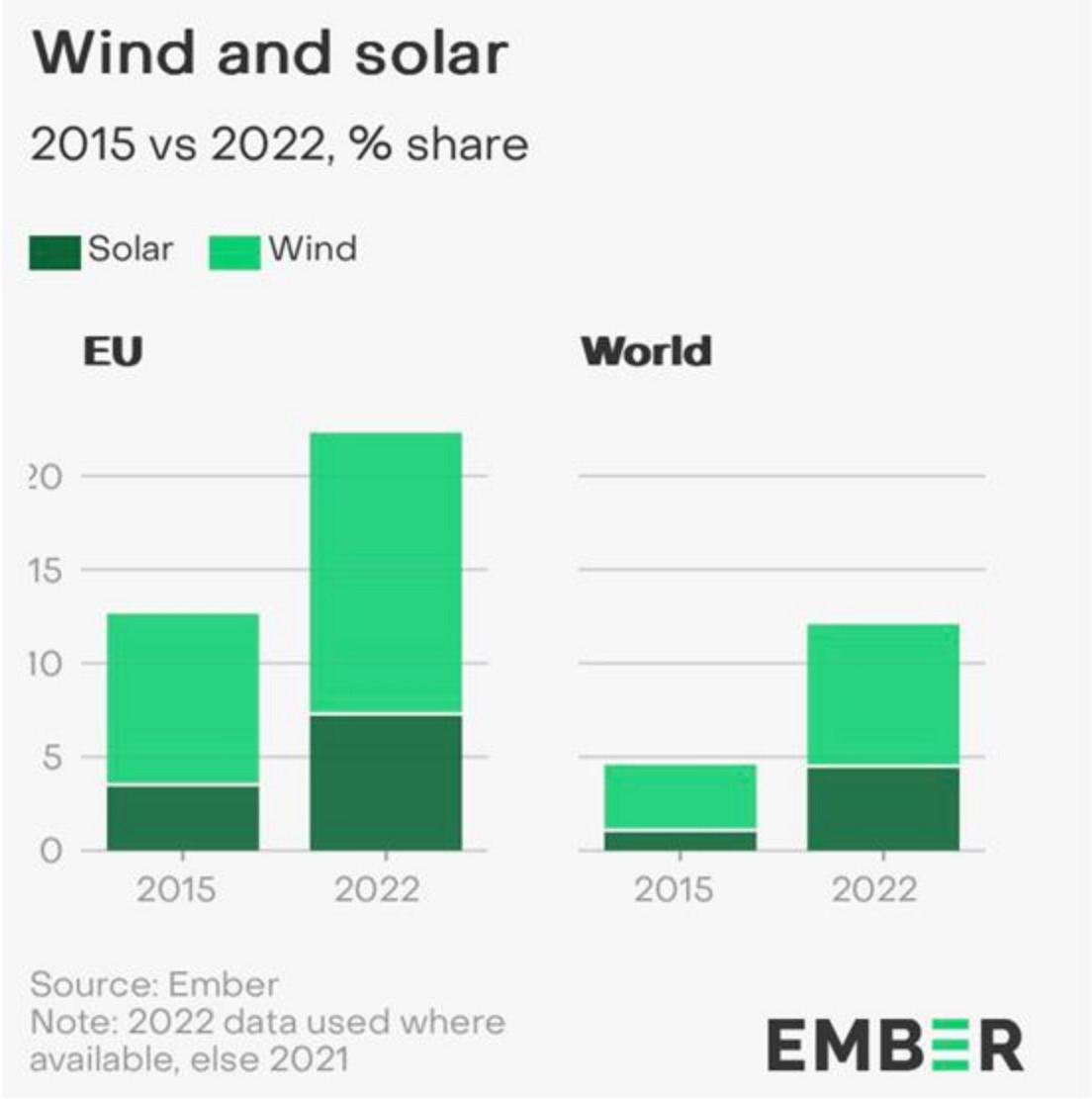
Substitution in EU

Wind and Solar grow in EU is the largest jump around the world



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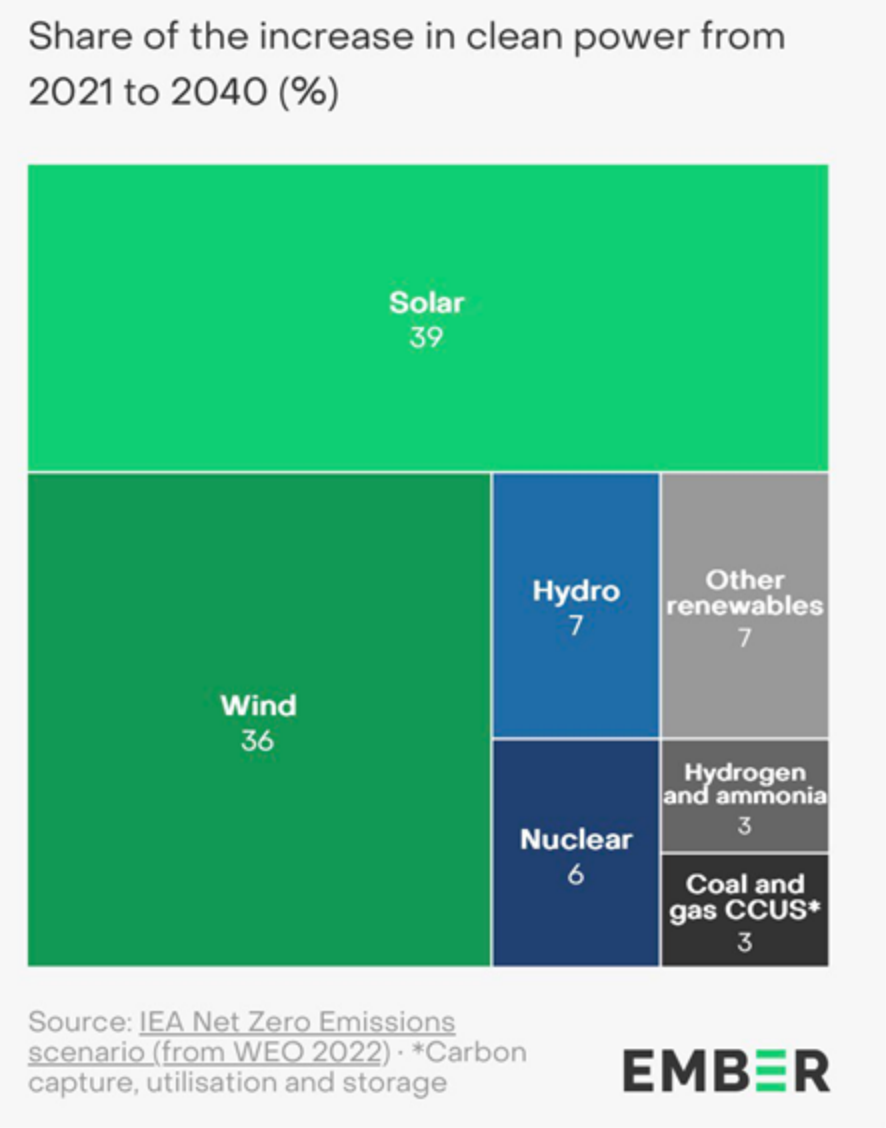
Substitution in future

Solar and wind will provide three quarters of new clean electricity



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2

Problems of using of renewable energy sources

Gap in generation between seasons

Gap between generation and consumption peaks

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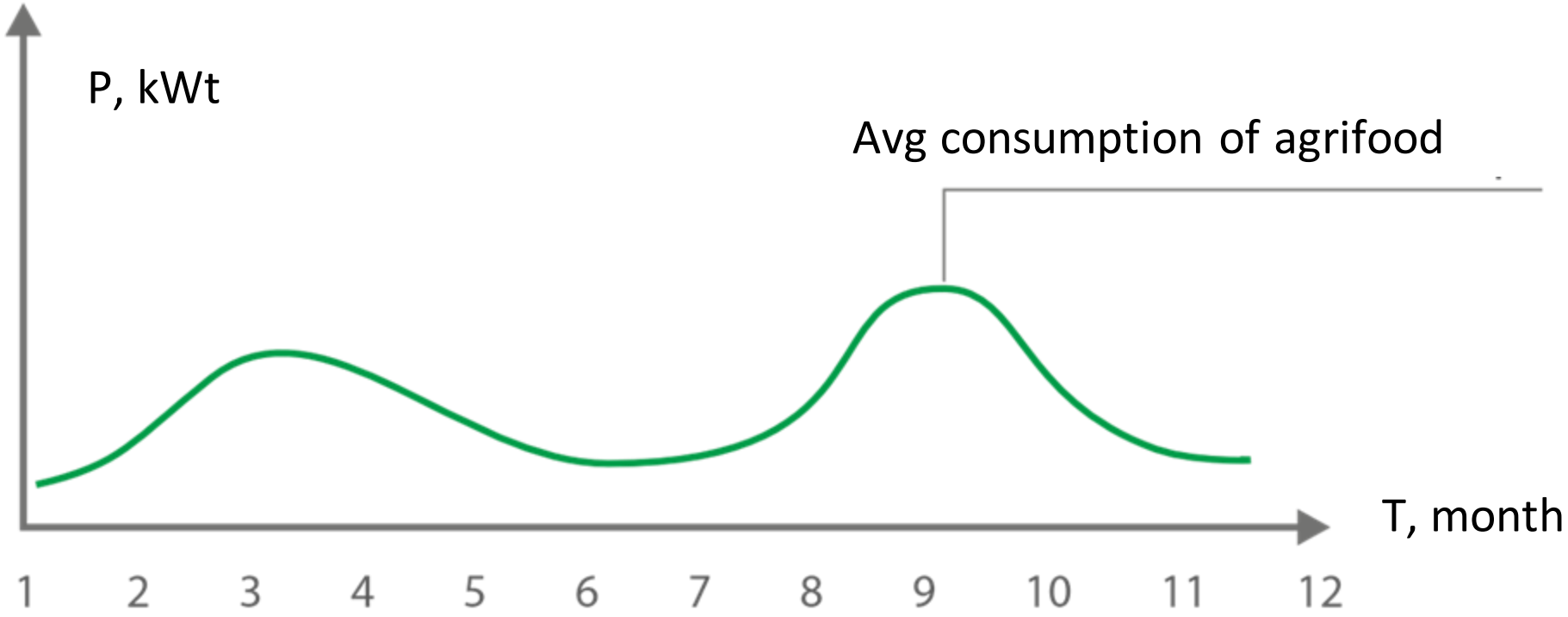
Energy efficiency

Gap in generation between seasons



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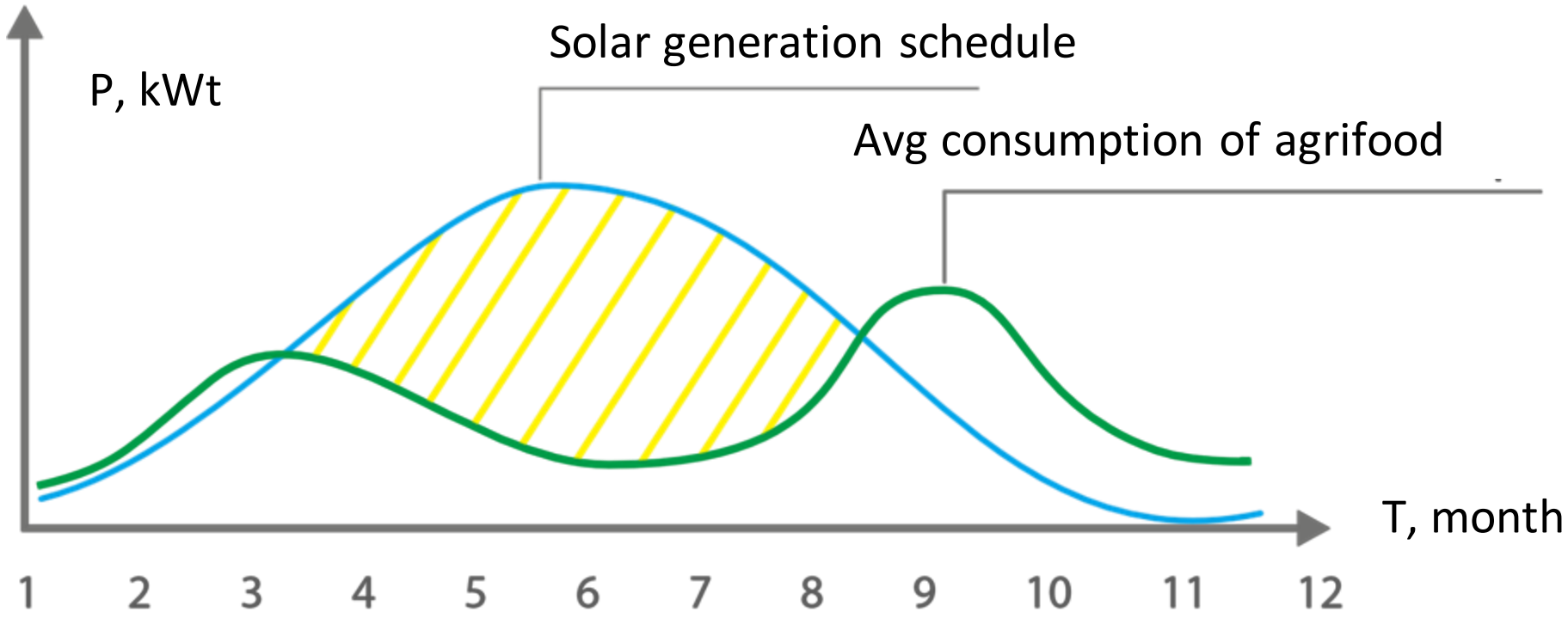
Energy efficiency

Gap in generation between seasons



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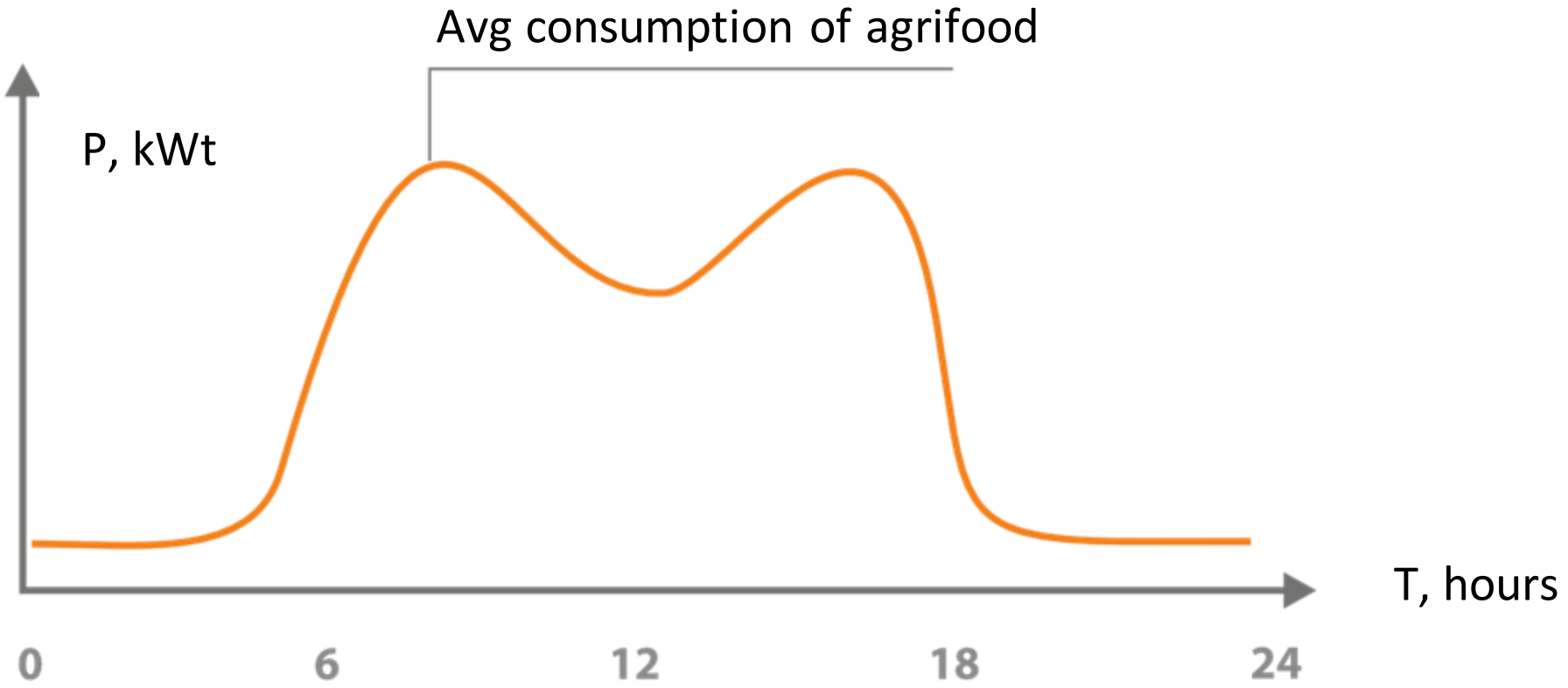
Energy efficiency

Gap between generation and consumption peaks



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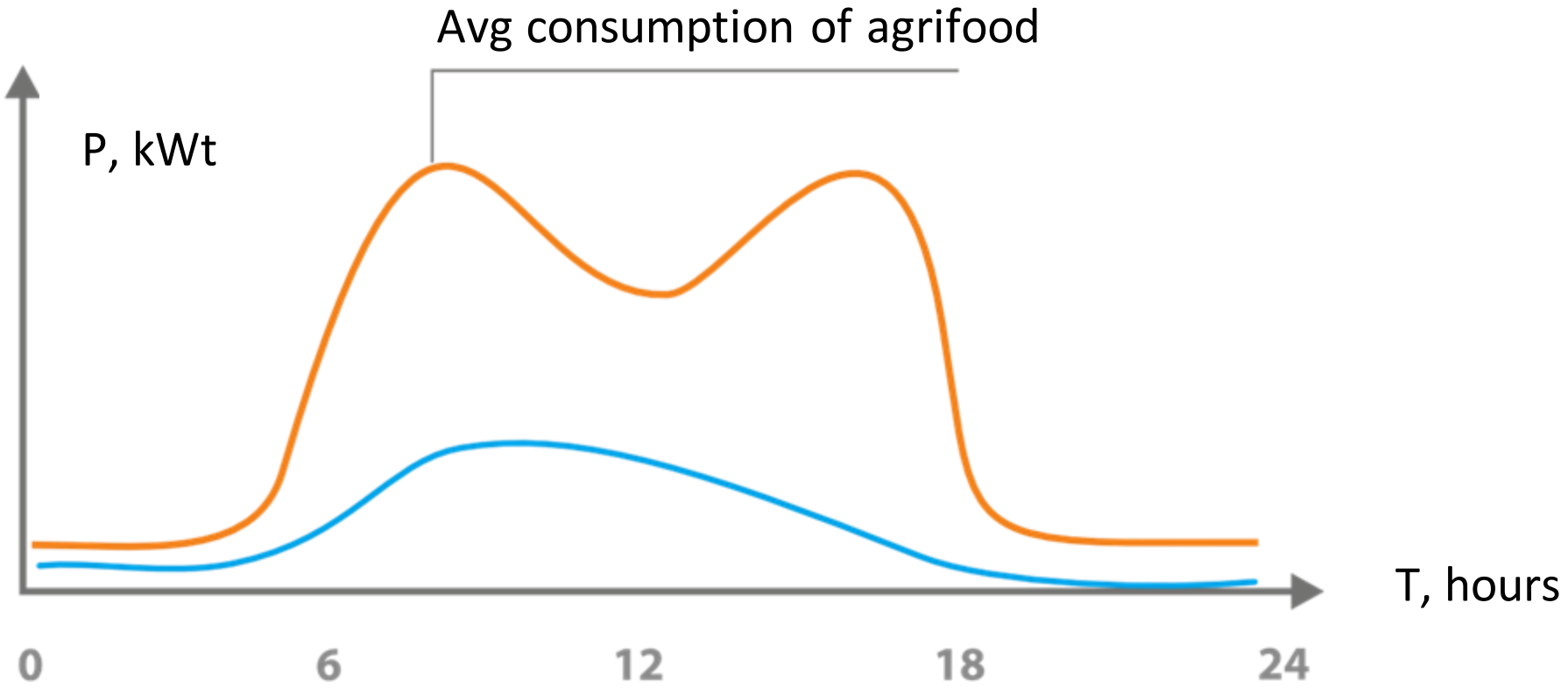
Energy efficiency

Gap between generation and consumption peaks



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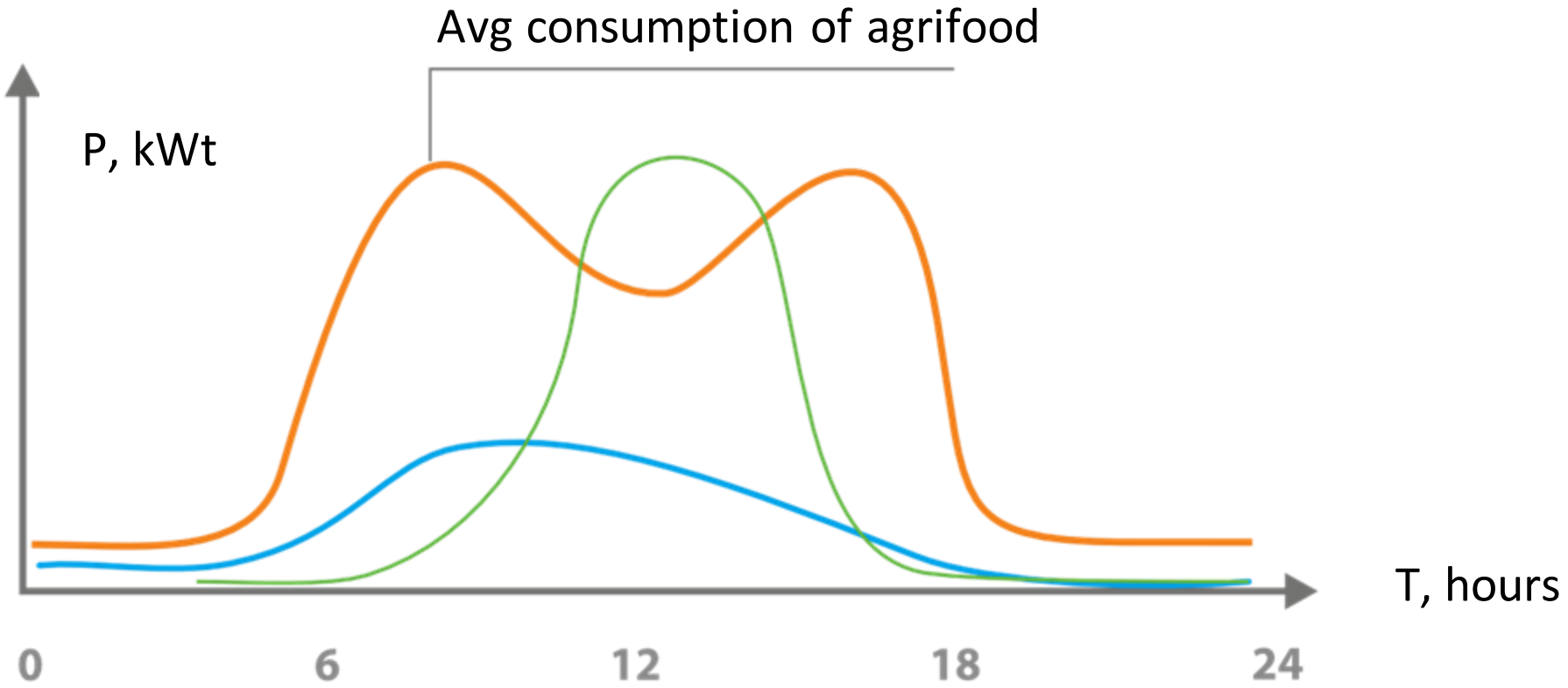
Energy efficiency

Gap between generation and consumption peaks



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3 How it can be solved and what a role of Government in this challenge

Accumulation of energy

Net billing & Net metering

Role of the Government

Green transition support programmes

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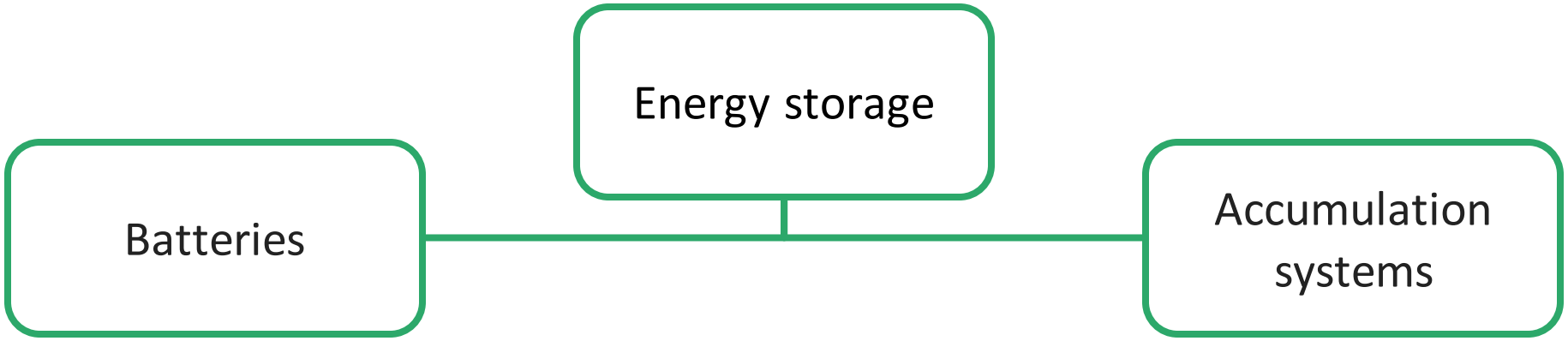
Accumulation of energy



Lead-Acid Battery

Lithium-Ion Battery

Flow Battery

Sodium-Sulphur Battery

Adiabatic Compressed Air Energy Storage

Diabatic Compressed Air Energy Storage

Pumped Hydro Storage

Pumped Heat Electrical Storage

Hydrogen Energy Storage

Green Ammonia Storage Technology

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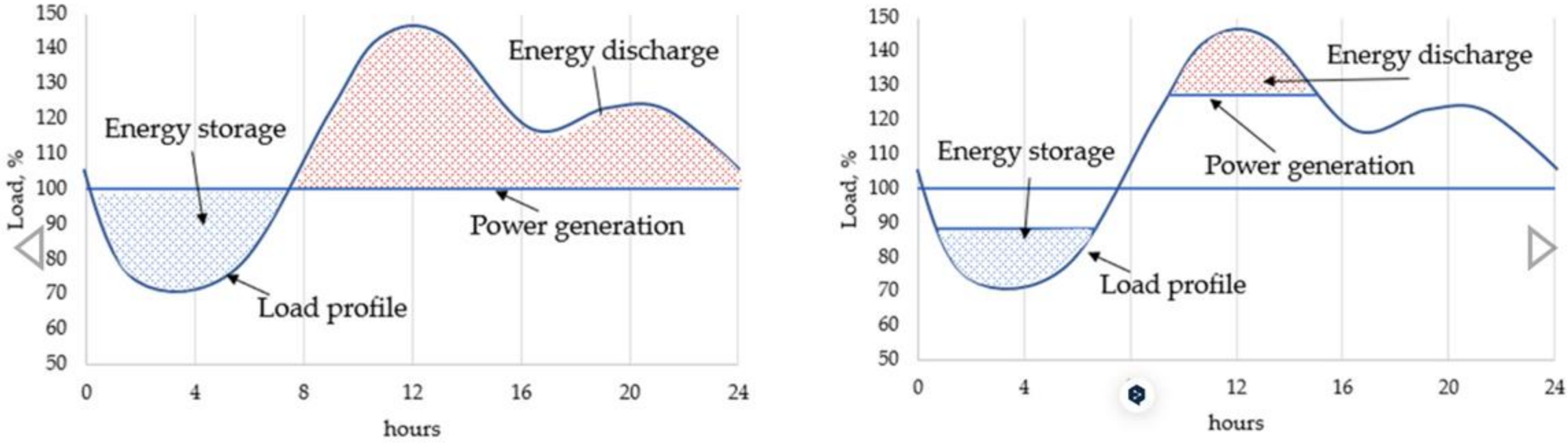
Accumulation of energy



Accumulation system operation in a power grid: (a) load leveling; (b) peak shaving.

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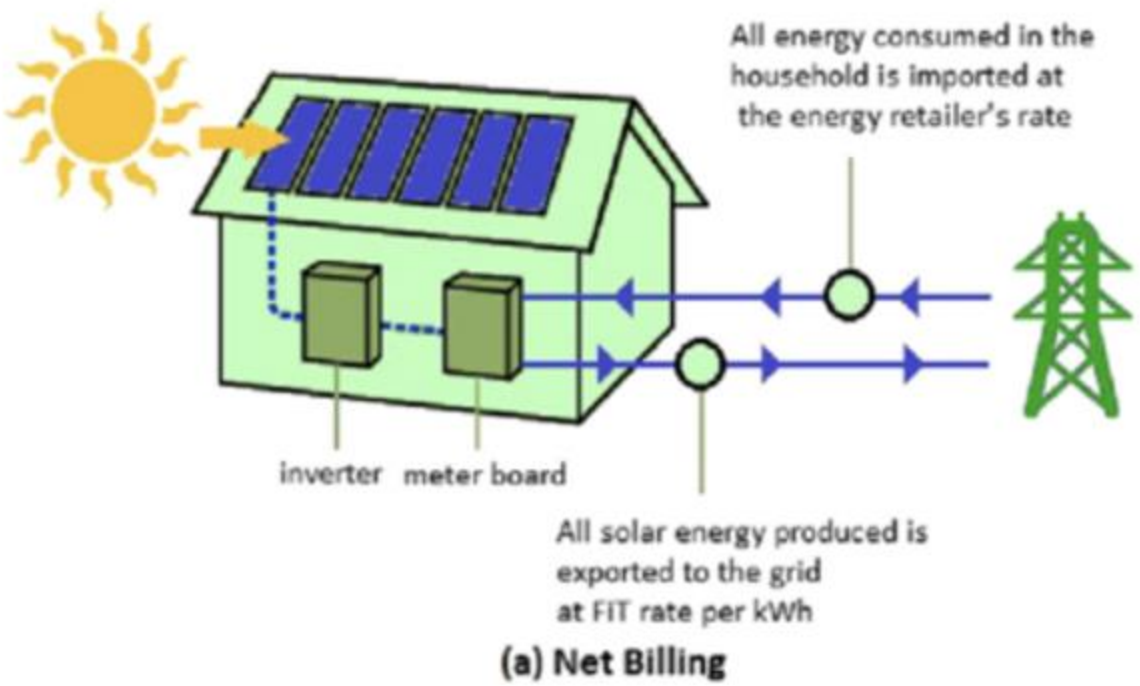
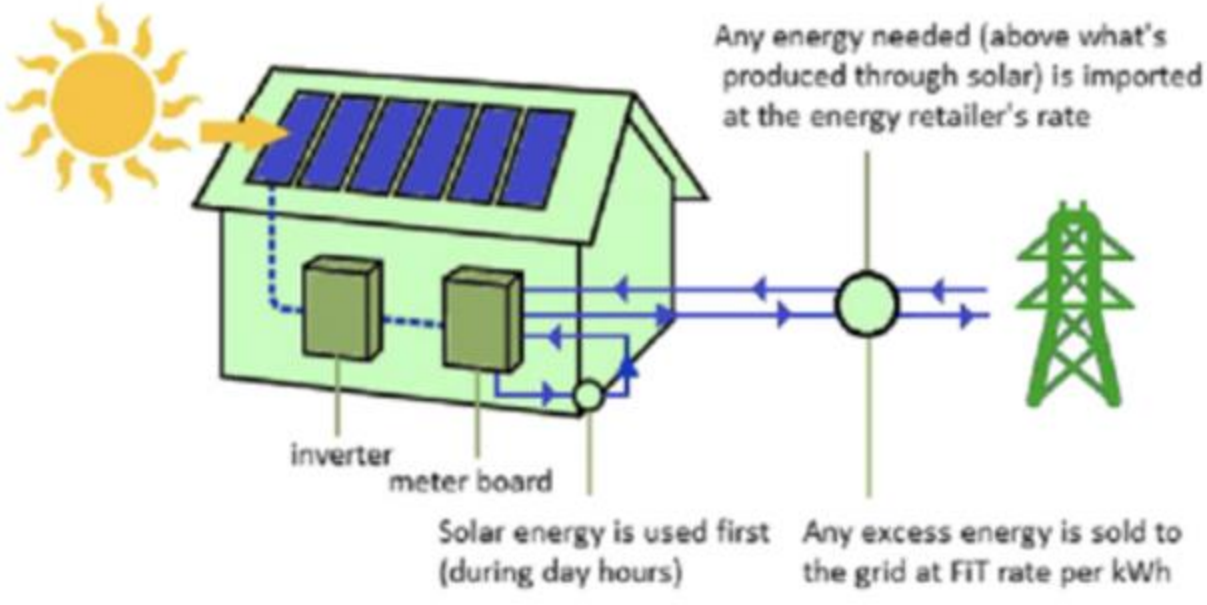
Net billing & Net metering



(a) Net Billing



(b) Net Metering

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Role of the Government

- Extend existing subsidy schemes for small businesses.
- Support energy audits and advice services.
- Mandate the implementation of audit recommendations.
- Support the implementation of an energy management system
- Strengthen the energy services market
- Provide financial guarantees for energy efficiency investments to facilitate access to finance
- Support the switch away from fossil fuels towards electrification, connections to central steam production
- Support employee-led initiatives and behavioural campaigns to motivate people to reduce energy use in the workplace
- Facilitate networking of multiple companies to simultaneously develop their energy audits or energy management systems
- Ensure easy access to relevant information

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GRANTS

- why I need to change something?
- a huge start investment
- a lot of details how to make things in a right way

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Debt-for-climate swaps

More than 50 of the poorest developing countries are in danger of defaulting on their debt and becoming effectively bankrupt, including 28 of the world's top 50 most climate-vulnerable countries.

While they represent just 3% of the global economy, they account for over half of people living in extreme poverty.

Debt swaps for climate or nature are not new, but a new wave of substantially larger deals might be part of the solution to debt distress and a way of directing additional resources to climate and conservation.

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Q&A session

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4

Calculation of the payback for the transition to renewable energy sources

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Task

Power - 100kW

Start investment - 46,786 euros

First year generation - 20,143 euros

Degradation per year - 1%

What is a payback period?

What results can we have after 5 years?

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Example of Calculation

Start investment - 46,786 euros

Power - 100kW

Geography - Ukraine

Month	Generation, kWh	Economy, euro
January	2,653.00	505.33
February	4,715.00	898.10
March	8,802.00	1,676.57
April	13,209.00	2,516.00
May	14,894.00	2,836.95
June	12,923.00	2,461.52
July	11,799.00	2,247.43
August	15,085.00	2,873.33
September	9,269.00	1,765.52
October	7,910.00	1,506.67
November	3,047.00	580.38
December	1,447.00	275.62
Total generation	105,753.00	20,143.43

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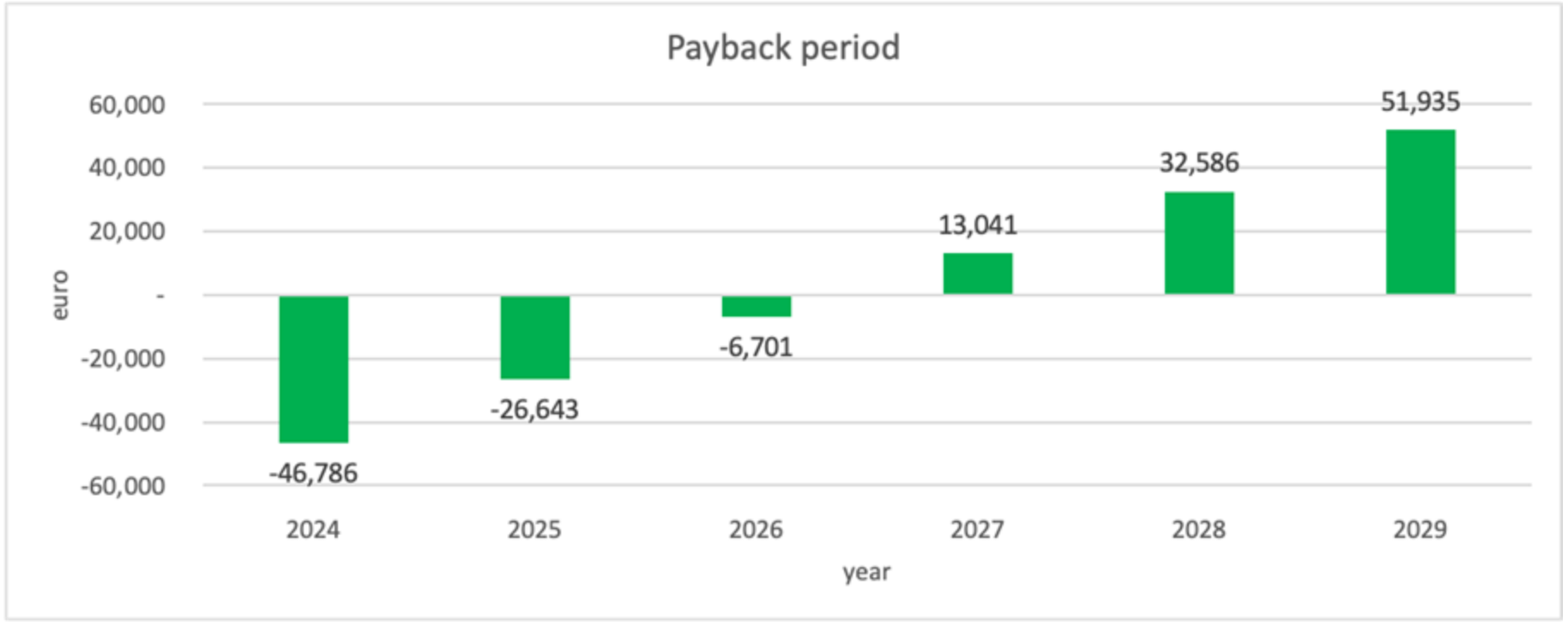
Example of Calculation

Start investment - 46,786 euros

First year economy - 20,143 euros

Payback period - 3 years



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5 Case Study

“Experience in using renewable energy sources in cattle and greenhouse farming"

"Reducing energy consumption and reducing electricity bills through the implementation of automated systems for collecting and analyzing detailed data in energy management at agri-food enterprises"

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Case Study part 1.
Farming enterprise ‘Veles Vita’

- Project Objectives
- Stages of implementation
- Technical solution
- Conclusions

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Project Objectives

Veles Vita set forth an ambitious goal to reduce its reliance on conventional electricity by harnessing the power of the sun.

The primary objective was to construct a solar power plant capable of generating 60 kW, with a future expansion option to 120 kW.

This initiative aimed not only to fulfill the internal energy requirements of the farm but also to set a benchmark for sustainability in the agri-food sector.

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Stages of implementation

1. Needs Assessment and Technical Evaluation
2. Design and Planning
3. Regulatory Compliance and Documentation
4. Installation and Testing
5. Innovation in Lighting

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Technical solution

Duration - 18 working days

Power of the SPP (inverter) - 100 kW;

Solar field capacity - 60 kW;

The area of solar modules is 280 sq.m;

Power of one module - 550 W;

Type (module) - Monocrystalline;

Additional load on the roof - 13kg/m.sq;

Tilt angle - 20 degrees;

Orientation - South

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Conclusion

Veles Vita's successful integration of solar energy underscores the vast potential of renewable energy in fostering sustainable agri-food systems.

For social economy SMEs and entrepreneurs, this case study illustrates the tangible benefits of embracing green energy solutions.

By investing in renewable energy, agri-food enterprises can achieve not only environmental and economic gains but also position themselves as leaders in sustainability.

The Veles Vita project is a compelling example of how innovation, when aligned with sustainability goals, can create resilient and eco-friendly agri-food systems for the future.

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Case Study part 2.
Greenhouse farm ‘Plantex’

- Project Objectives
- Stages of implementation
- Technical solution
- Conclusions

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Project Objectives

Plantex LLC set forth with a clear vision to reduce its dependence on traditional energy sources by harnessing solar power. The project's ambitious goals were twofold:

Construction of Two Solar Power Plants:

A 32.4 kW plant operating under a green tariff, designed to directly offset a portion of the company's electricity demand without solar power storage.

A 50 kW hybrid power plant equipped with battery storage, offering enhanced flexibility and energy security.

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Stages of implementation

1. Strategic Planning and Design
2. Legal and Regulatory Compliance
3. Installation and Optimization

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Technical solution (1/2)

Green Tariff
Duration - 14 working days
SPP (inverter) power - 27 kW;
Solar field capacity - 32.4 kW;
The area of solar modules is 140 sq.m;
Power of one module - 540 W;
Type (module) - Monocrystalline;
Additional load on the roof - 13kg/m.sq;
Tilt angle - 20 degrees;
Orientation - South

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Technical solution (2/2)

Hybrid station
Duration - 18 working days
Power of the SPP (inverter) - 50 kW;
Solar field capacity - 50 kW;
Battery capacity - 5.12 kwh
The area of solar modules is 160 sq.m;
Power of one module - 540 W;
Type (module) - Monocrystalline;
Additional load on the roof - 14kg/m.sq;
Tilt angle - 20 degrees;
Orientation - South

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Conclusion

The Plantex greenhouse farm case study underscores the transformative potential of renewable energy in the agri-food sector.

For social economy SMEs and entrepreneurs, this narrative serves as an inspiration and a guide on integrating sustainable practices into their operations.

By embracing renewable energy, agri-food enterprises can achieve environmental goals, realize economic gains, and position themselves as frontrunners in the journey towards a more sustainable and resilient food system.

The success of Plantex illuminates the path for others in the sector to follow, promising a greener future for our planet.

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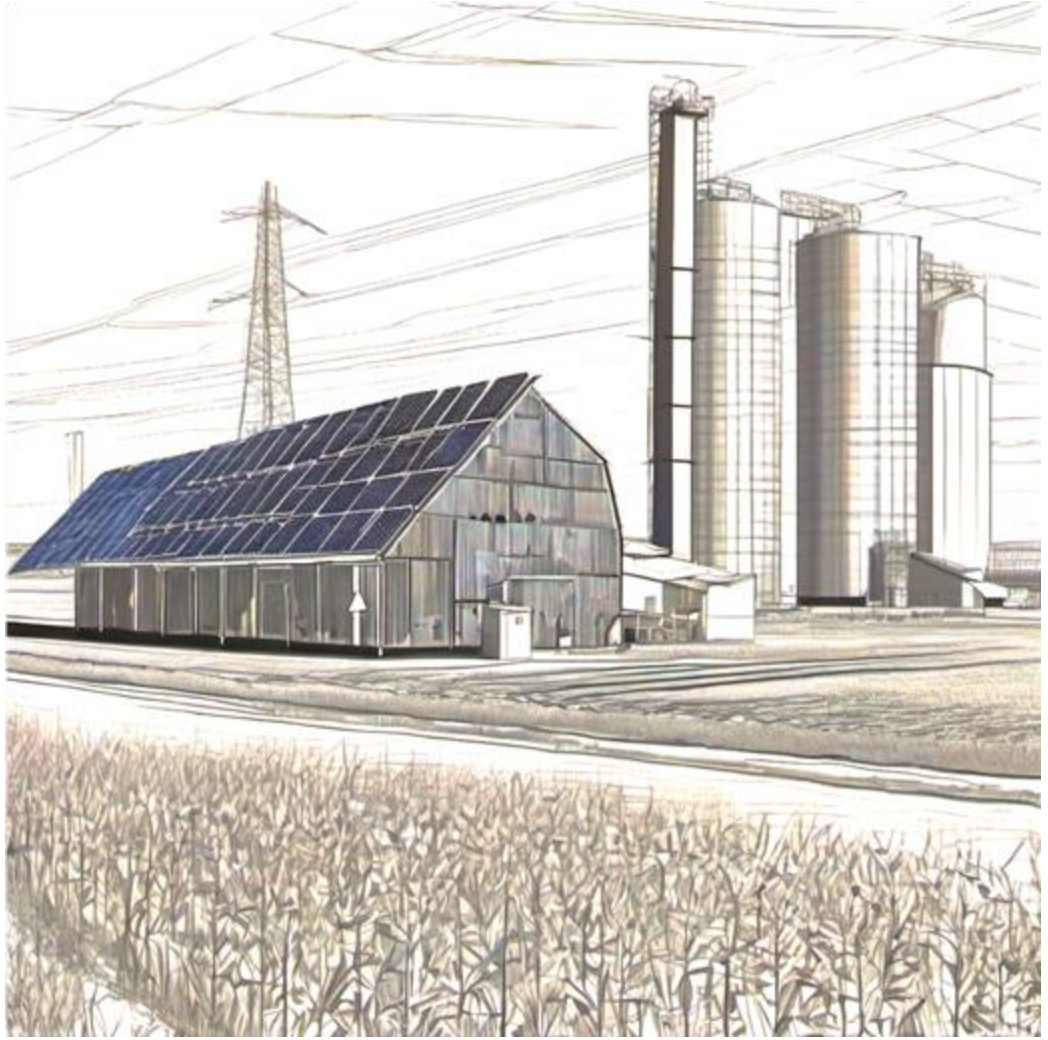
Key takeaway

Diversify your energy portfolio with solar power to reduce costs and appeal to a broader customer base. The commitment to renewable energy can become a unique selling proposition that differentiates your brand in a crowded market.



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PROMAVTOMATYKA

Vladyslav Diachuk

- head of the commercial section of the automation department
- specializing in automated control systems, hardware production, services of electrical installation, solar and wind generation
- higher professional technical and economic education
- about ten years in sales
- participant in national and european forums and exhibitions

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Case Study part 3.
Lviv Bread Plant No. 1 'Concern Khlibprom' PJSC

- Technical task
- Features of the technical solution
- Stages of implementation
- Visualization of a technical solution (structure chart, SCADA screens, consumption graph)
- Conclusions

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1 Technical task

- Determination of parameters and installation of new equipment (analyzers of network parameters) should be focused on the possibility of automated collection of the consumed information

- Installation of electricity consumption metering devices that allow data collection via an open protocol.

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2 Features of the technical solution

System is being created with the aim of:

- ensuring the collection and primary processing of the initial information necessary for reporting on electricity consumption indicators;
- creation of a single system of reporting on activity indicators;
- improving the quality (completeness, accuracy, reliability, reliability) of information;
- provision of access to technical information from plants for heads of the concern and technical specialists;
- provision of a unified methodology for calculating technical and economic indicators;
- ensuring the possibility of comparing the efficiency of factories, evaluating the results of rationalization initiatives, repairs, modernizations, reconstructions;
- creation of a single tool that will allow gathering all the necessary information about the operation of the plant, assessing the technical efficiency of the concern in general;

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3 Stages of implementation

The project was implemented in two phases (2016 and 2017):

- the first stage was to implement an electricity metering system
- the task of the second stage was to expand the existing system for gas, heat and output metering

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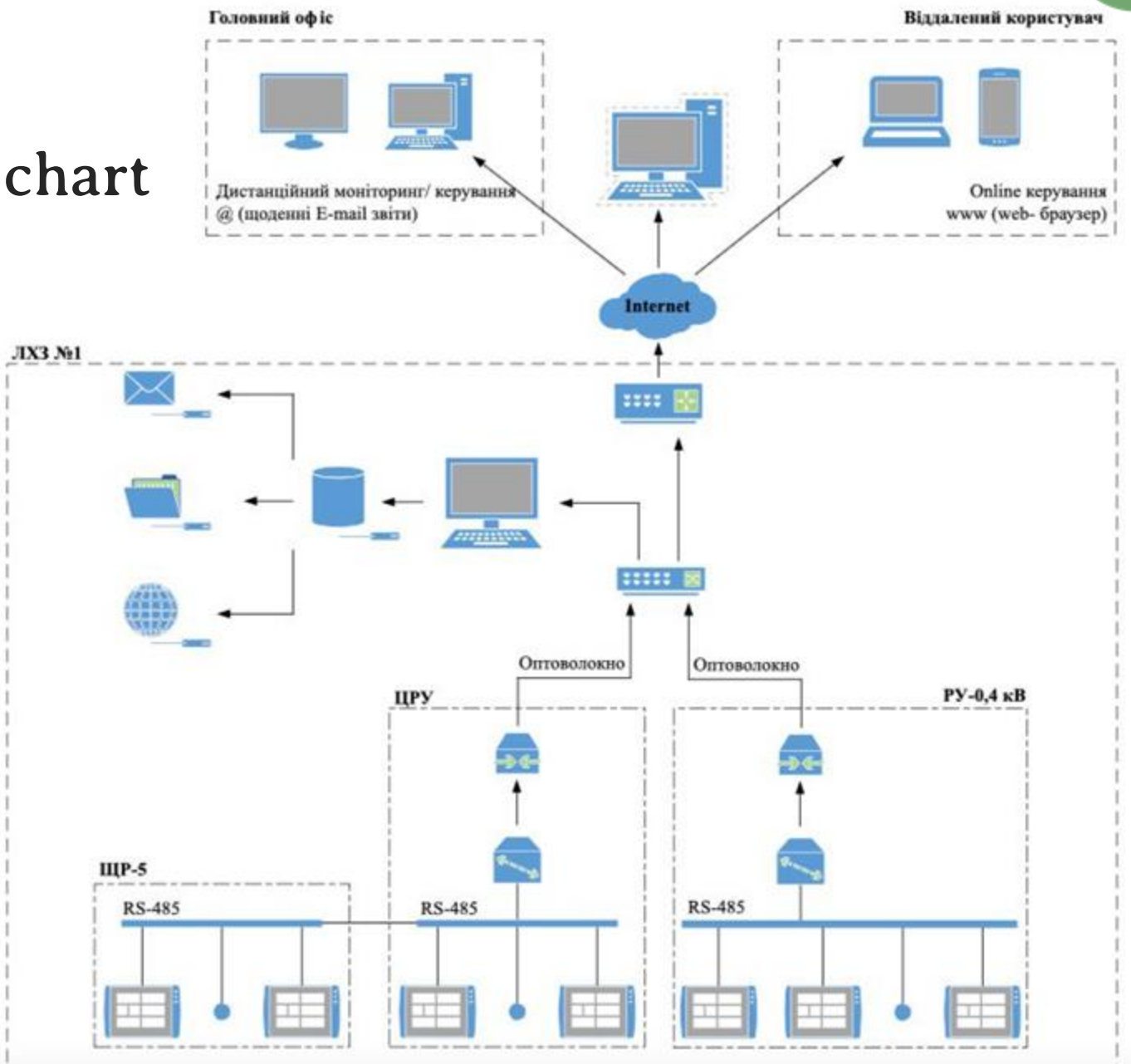
4 Structure chart



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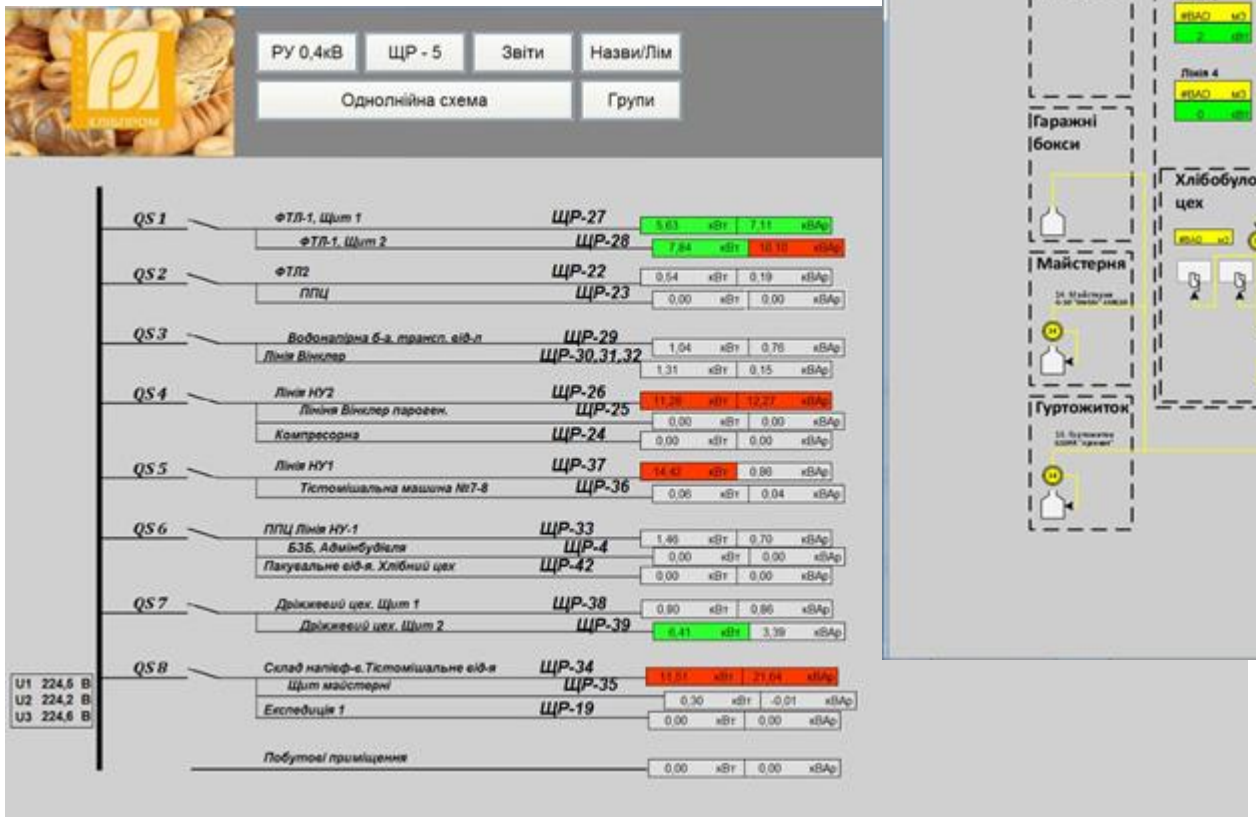
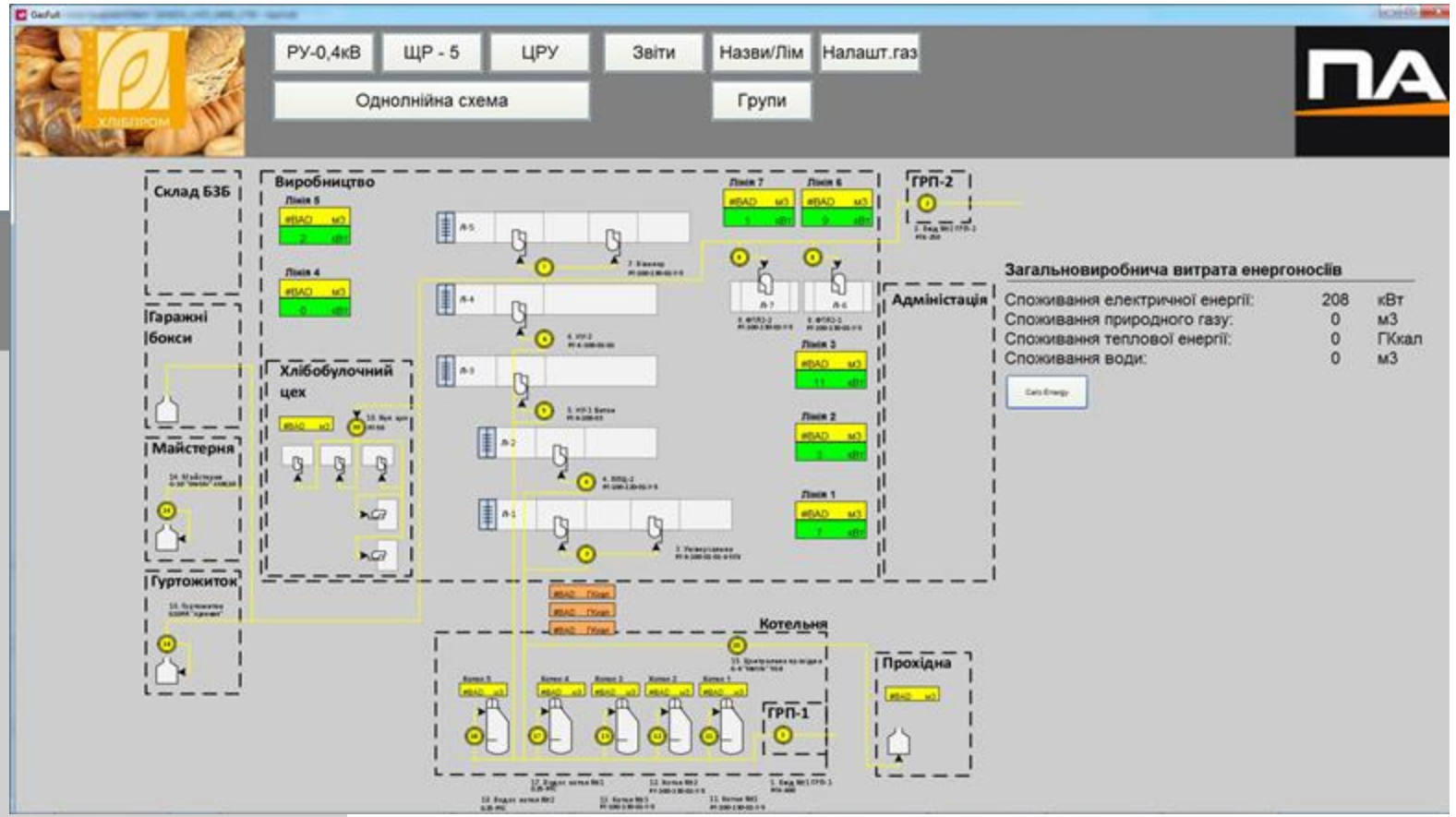
4 SCADA screens





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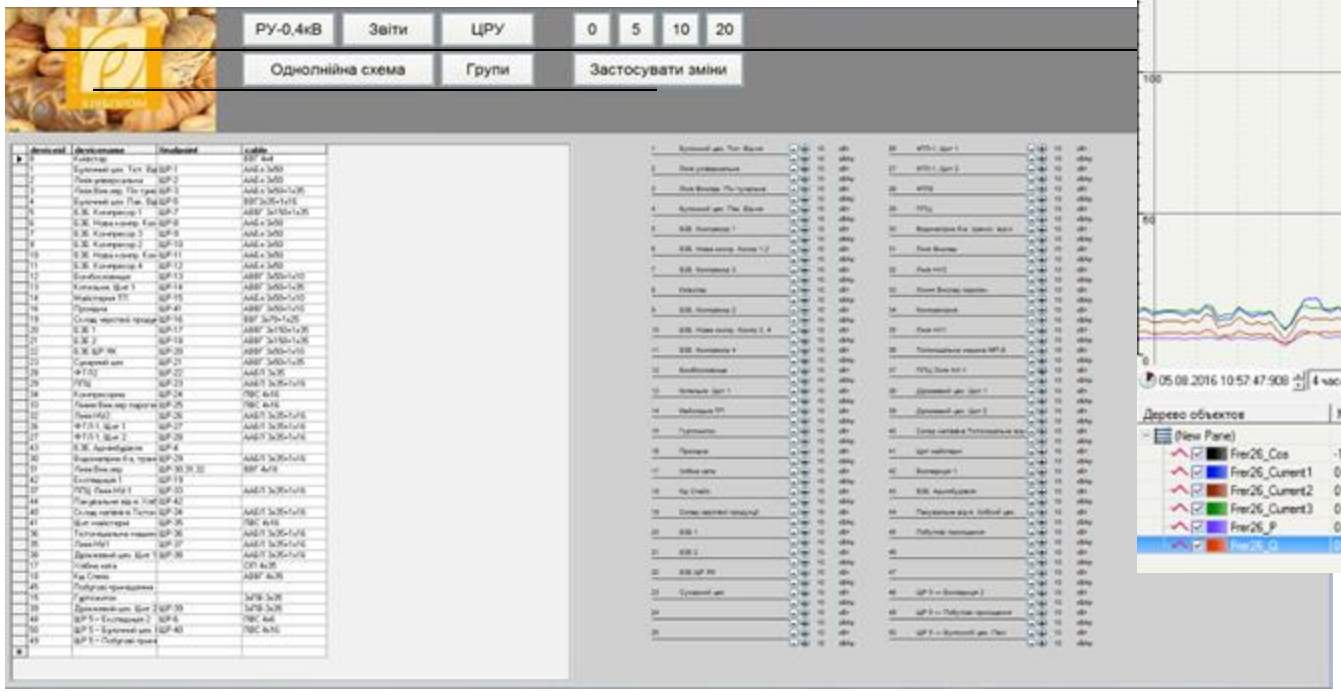
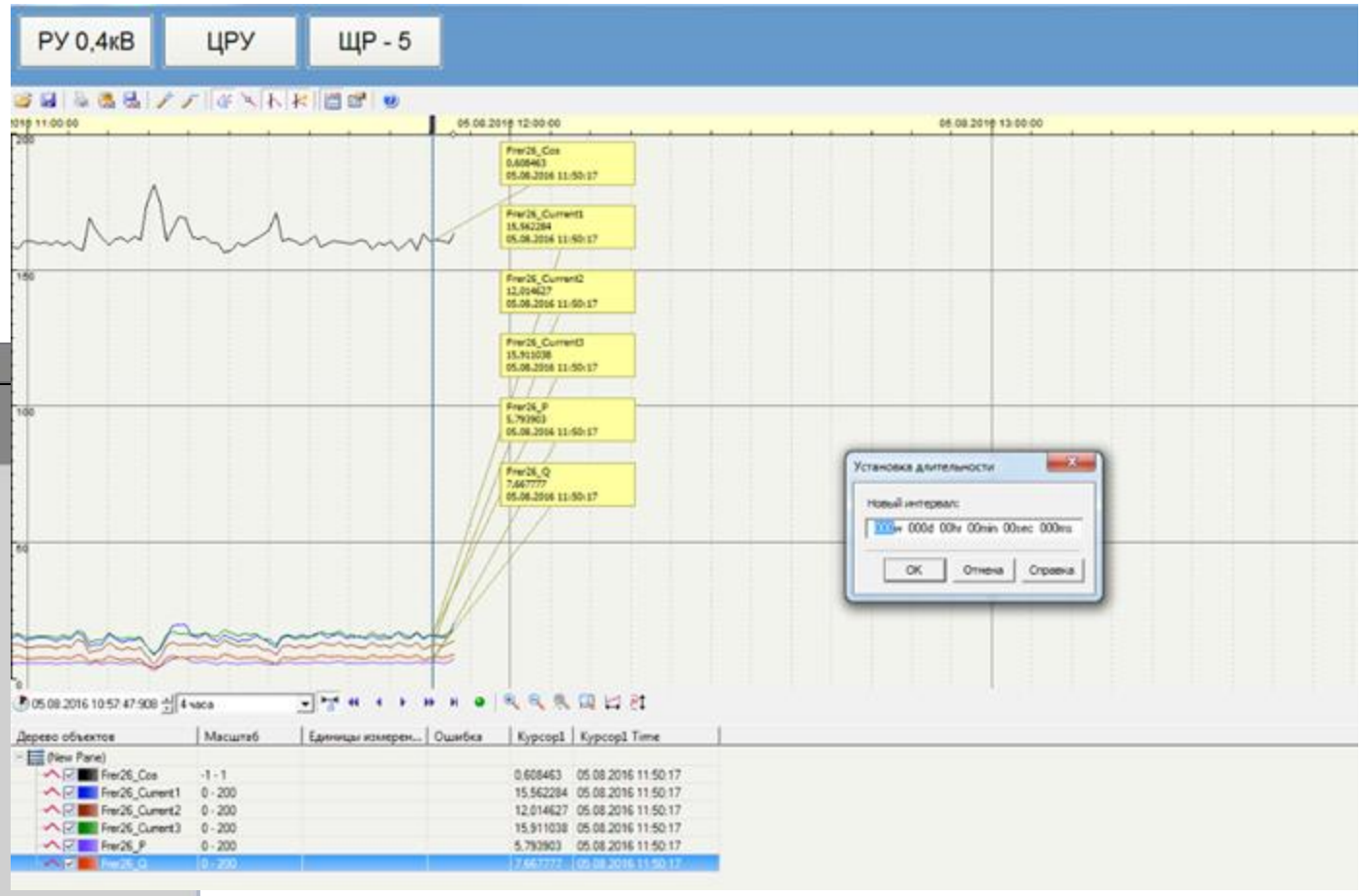
4 Consumption graph





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5 Conclusions

Key Takeaway: Implementation of technological solutions in energy management involving digitalisation of processes allows to reduce production costs and heat energy emissions.

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Thank you !

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