Центр
Економічного
Відновлення

The role of the electricity industry in the recovery of Ukraine's economy after the pandemic

June 2021

Electricity sector has come across a number of challenges that have a negative impact on the economic development

10% **380** GDP, UAH billion (2019)

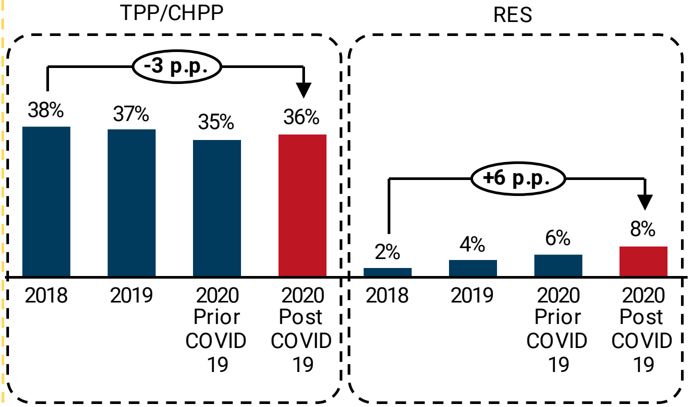
1% **120** Employees, thousand people (2018)

3% **32** Tax revenues, UAH billion

GENERATION

Production volume and installed capacity of power plants of the total, 2000–2020, %

Share of generation in the total volume of energy generated

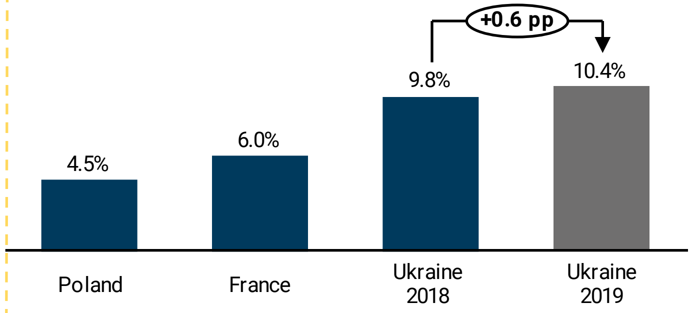


- **A significant number of TPPs/CHPPs will be decommissioned starting from 2021, reshaping the job market.**
- **The cost of investments in a solar power plant is declining in Ukraine and it remains as an attractive investment.**

SUPPLY AND DISTRIBUTION

Electricity losses and investments in distribution networks, 2018

Electricity losses in distribution networks, %

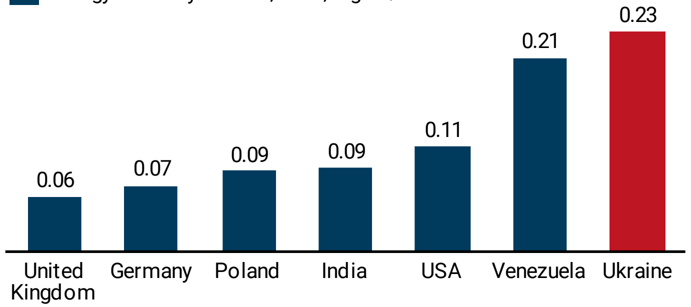


- **Power outages (SAIDI) in Ukraine are the longest in Europe and their duration reached 696 minutes in 2018.**
- **Introduction of RAB tariff will stimulate investments in energy infrastructure.**

CONSUMPTION

Energy intensity of GDP and final energy consumption in households by type of fuel, Ukraine and Europe, 2018

Energy intensity of GDP, 2019, kgoe / USD



- **Due to depreciated equipment and outdated technologies energy intensity of Ukrainian GDP is more than twice the world's average.**
- **Ukrainian houses are 3 times less energy efficient than those in Germany.**

Source: Economic Recovery Center, Eurostat, IAE

Projects in the electricity sector will ensure the recovery of Ukraine's economy

1. GENERATION

The system is anticipating long-term change of generating capacities with the commitment of 25% of RES till 2035 according to the Energy Strategy 2035

DEVELOPMENT OF PRIVATE SOLAR POWER PLANTS

Development of private solar power plants will help to reduce the leverage on the energy system and foster the **further decarbonization** of the ukrainian energy sector.

2. SUPPLY AND DISTRIBUTION

The electricity distribution networks require modernization as the losses in the distribution reach on average 10% along the distribution system

MODERNIZATION OF ELECTRICITY TRANSMISSION AND DISTRIBUTION NETWORKS

Modernization of the electricity networks will lead to **reduction in electricity losses** within the network and **reduce the risks** of the power outages.

3. CONSUMPTION AND MARKETS

ECONOMY
Ukrainian economy is one of the most energy-intensive in the world

POPULATION
Households, government organizations and industrial users face significant electricity costs due to low level of energy efficiency

ENERGY EFFICIENCY IMPROVEMENT

Energy efficiency measures will help to **reduce the consumption** of the energy resources and thus **reduce the costs** of the industry and the population spent on the energy.

Source: Economic Recovery Center

Installation of 50 ths household SPP will provide 5.4 BN UAH of additional revenues to the state budget

TYPES OF PROJECTS (ESTIMATION COSTS FOR 10 YEARS)

PROJECT - Household power plants up to 30 kW)

Benefits for the energy system:
- clean energy generation;
- additional energy system balancing capacity;
- prosumers market growth.

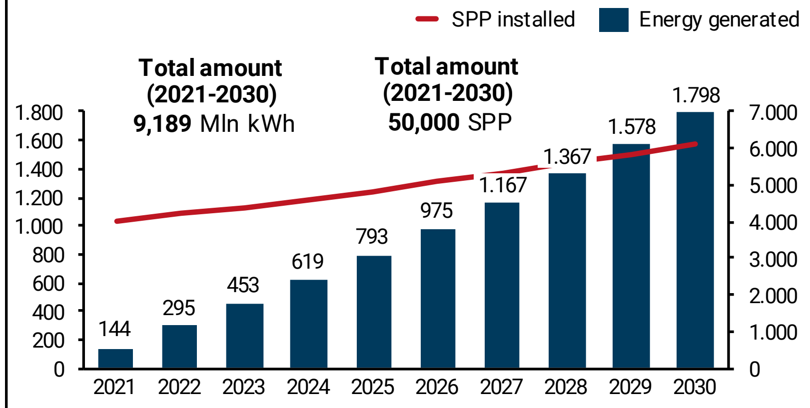
Benefits for investors:
- energy independence of households;
- additional revenues for the household; through "green tarrif".

Total amount of SPP (30 kWh) installed: 50 000
Total installed capacity: 1.5 GWh
Total program investments: 865 mln USD
- Required investment per project: USD 20 thousand
- Electricity produced by 1 SPP: 35970 kWh per year

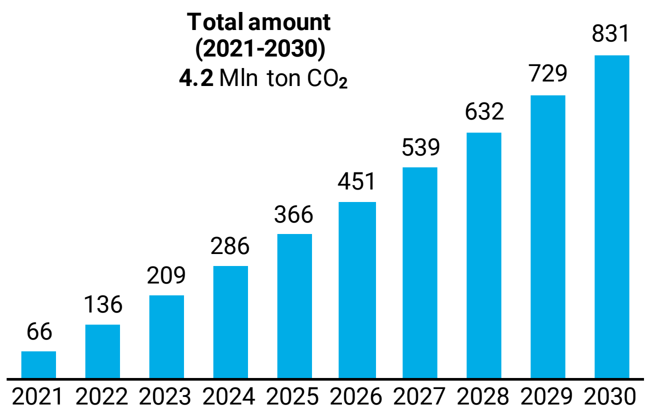
Households with the income of more than USD 41 thousand per year: 744 thousand
Required amount of households to be involved over 10 years: 0.54%

EFFECT FROM PROJECTS IMPLEMENTATION

SPP INSTALLED AND ENERGY GENERATED (MLN kWh)

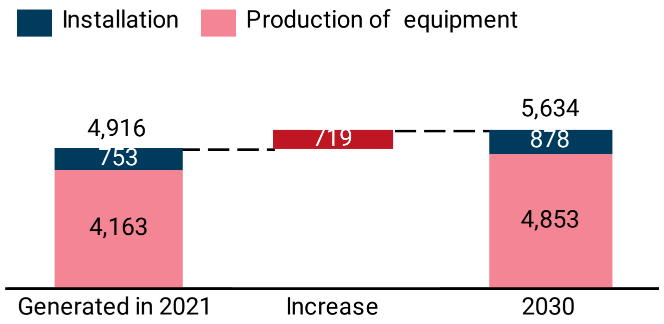


REDUCTION OF CO_2 EMISSIONS (thousand-ton CO_2)

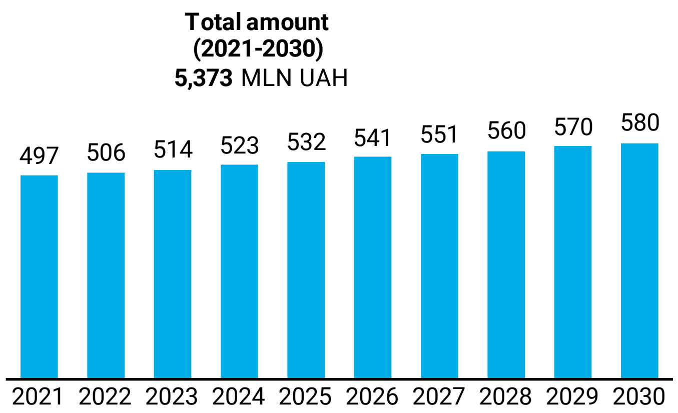


EFFECT ON THE ECONOMY

GENERATED JOBS



STATE BUDGET REVENUES[1], MLN UAH



Source: Economic Recovery Center

Note: 1- State budget revenues include revenues from materials used for SES and jobs generated

Implementation of RAB tariff will provide 72 BN UAH of additional revenues to the state budget

TYPES OF PROJECTS (ESTIMATION COSTS FOR 10 YEARS)

RAB-tariff implementation will ensure INVESTMENTS OF 202 BN UAH for 7 general projects:

PROJECT 1. Reconstruction and modernization of electrical networks **~101 BN UAH**

PROJECT 2. Creating technical prerequisites for the development of distributed generation with RES **~ 21 BN UAH**

PROJECT 3. Introduction of SMART GRID technologies **~20 BN UAH**

PROJECT 4. Improving the efficiency and cost - effectiveness of networks by reconfiguring them (changing the topography of networks) **~20 BN UAH**

PROJECT 5. Automation of electricity metering systems **~16 BN UAH**

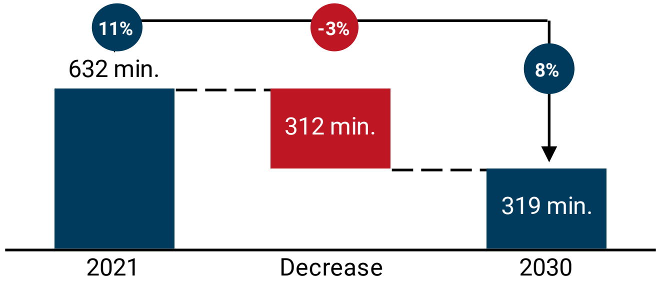
PROJECT 6. Implementation of measures for automation, scheduling and telemetry of DC operating voltage **~14 BN UAH**

PROJECT 7. Implementation of measures to compensate for reactive power **~10 BN UAH**

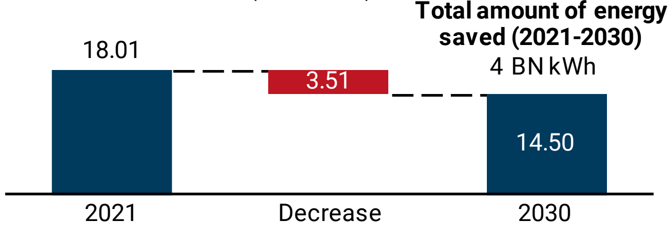
Source: Economic Recovery Center

EFFECT FROM PROJECTS IMPLEMENTATION

SAIDI (MINUTES) AND LOSSES IN DISTRIBUTION NETWORKS (%)

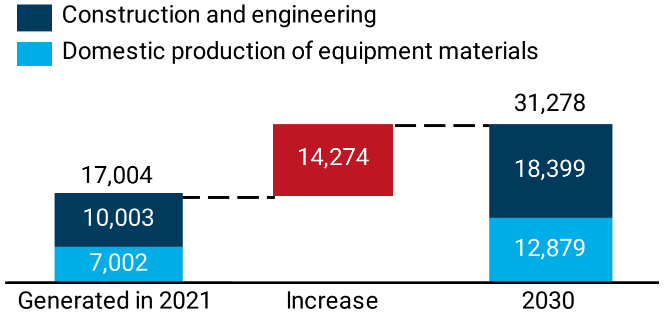


ENERGY LOSSES[1] (BN kWh)

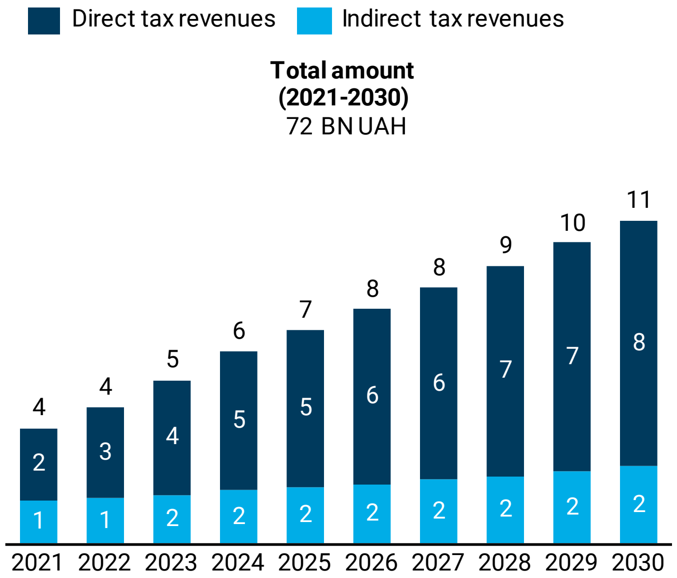


EFFECT ON THE ECONOMY

GENERATED JOBS



DIRECT AND INDIRECT STATE BUDGET REVENUES, BN UAH



Note: 1- Estimations based on NCER approved electricity losses reduction plan through RAB measures implementations (up to 7%) until 2035

Implementation of 8252 energy efficient projects for industry by 2030 will provide 19.7 BN UAH additional revenues to the state budget

TYPES OF PROJECTS

Capital investment for ~ 8252 projects is 36 BN hrn

General types of projects:

PROJECT 1. Modernization of the lighting system **~ 1 MLN UAH**

PROJECT 2. Modernization of electrical equipment with the use of frequency control **~ 1-3 MLN UAH**

PROJECT 3. Modernization of heating, ventilation, air conditioning systems **~ 3 MLN UAH**

PROJECT 4. Modernization of compressor equipment**~ 1 MLN UAH**

PROJECT 5. Modernization of gas equipment **~ 2-3 MLN UAH**

PROJECT 6. Monitoring and energy management system **~ 0.5 MLN UAH**

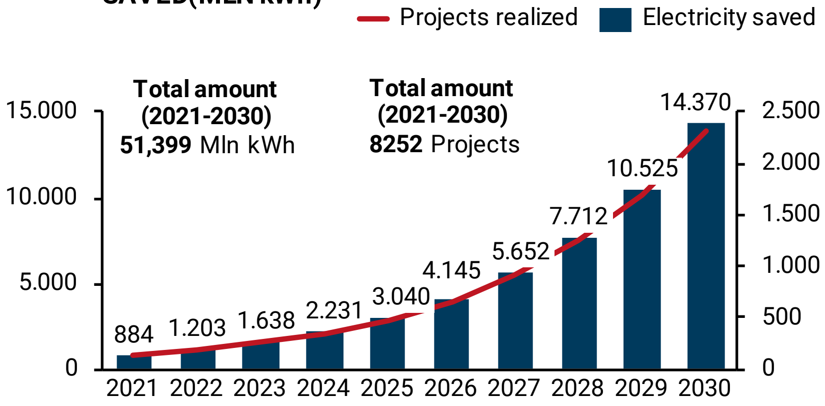
Effects of projects:

~ 1 MLN of UAH =

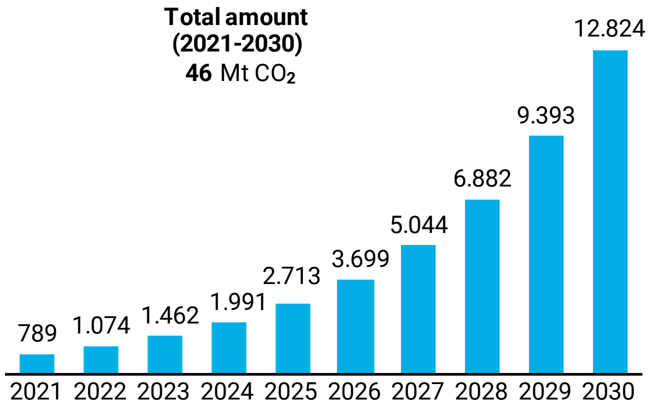
- 409 THS kWt of energy savings
- 365 t CO^2 of energy savings
- 1.8 new jobs

EFFECT FROM PROJECTS IMPLEMENTATION

PROJECTS IMPLEMENTED AND ELECTRICITY SAVED(MLN kWh)

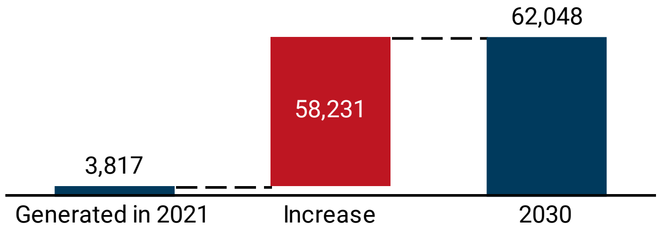


REDUCTION OF CO_2 EMISSIONS (Mt CO_2)

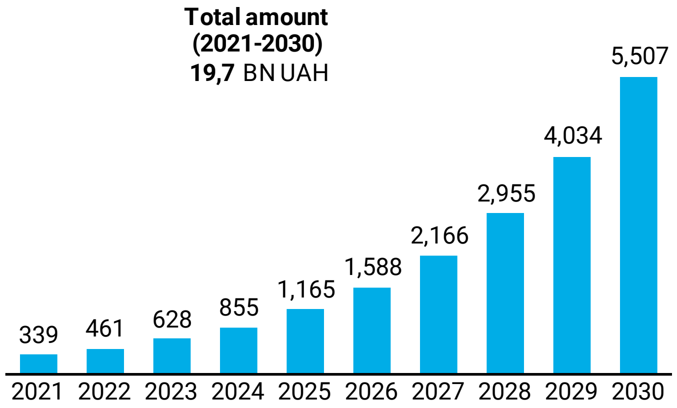


EFFECT ON THE ECONOMY

GENERATED JOBS



STATE BUDGET REVENUES, MLN UAH



Source: Economic Recovery Center, YASNO Efficiency, GIZ, Ukrastat

Updating lightning and electrical appliances and building energy efficient buildings will generate additional 90 thousand workplaces

UPDATING LIGHTNING AND ELECTRICAL APLLIANCES

The transition from incandescent to more energy-efficient LED lamps and lamps with motion sensors for outdoor lighting **will reduce electricity consumption by more than 50%**

Project cost - **~4.7 BN UAH**

# of households covered: **~ 6 MLN (40%)**

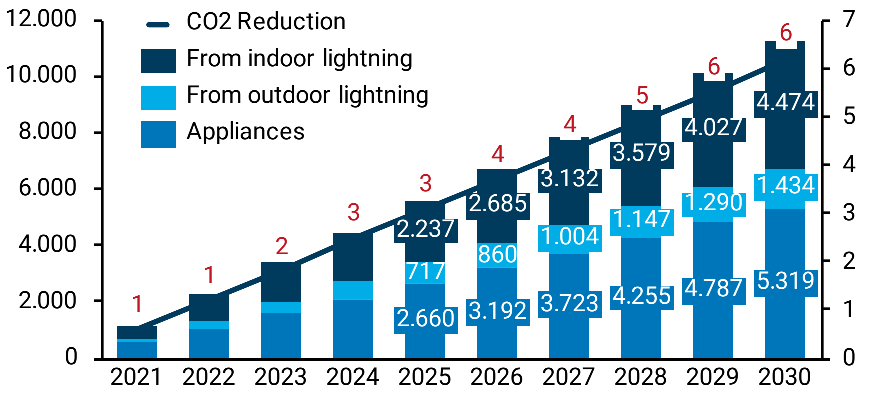
Due to the replacement of obsolete devices with new high-end power consumption will reduce **costs by 30-70% of the existing base of devices**

Project cost - **~64 BN UAH**

# of of households covered: **~ 13.4 MLN (90%)**

EFFECT FROM PROJECTS IMPLEMENTATION

ELECTRICITY SAVINGS (MLN kWh) AND CO^2 REDUCTION (MT CO^2)



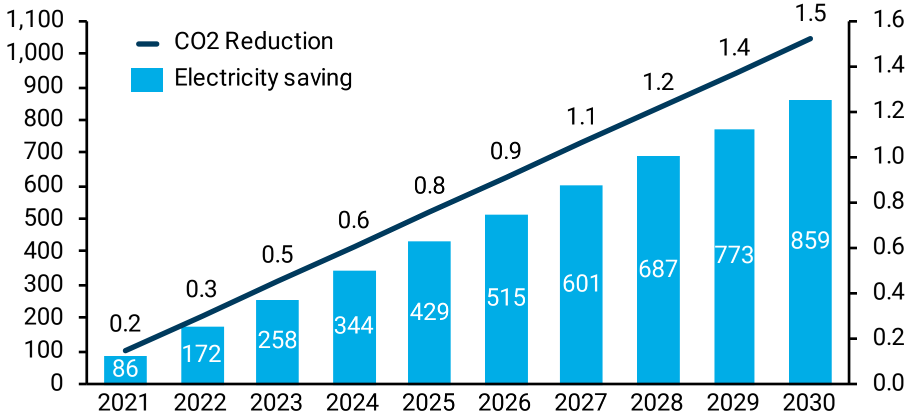
BUILDING NEW ENERGY EFFICIENT RESIDENTIAL BUILDINGS

Construction of energy efficient houses, in which heat losses are minimized and the latest energy saving technologies (heat pump) are additionally installed allow **to reduce heating costs to <60 kWt/m³**

Project cost - **~1.4 TRL UAH**

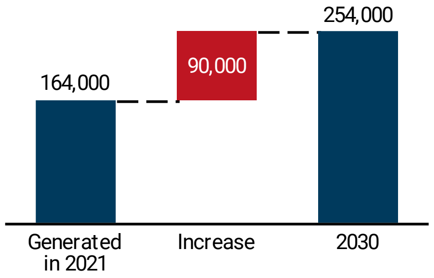
# of households living in new energy effective building : **~ 740 THS**

ELECTRICITY SAVINGS, (MLN kWh) AND CO^2 REDUCTION (MT CO^2)

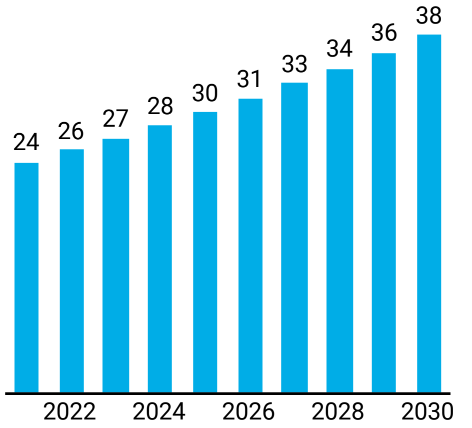


EFFECT ON THE ECONOMY

GENERATED JOBS



STATE BUDGET REVENUES, BN UAH



Source: Economic Recovery Center, ODYSSE and MURE database, Ministry for regional development, GIZ, SAE

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