



**CLEAR
ENERGY**

*Renewable Energy
Clean Environment
Clear Future*



COMPANY OVERVIEW

Clear Energy LLC is one of the leading companies in Ukraine in renewable energy projects and waste management.

The company was founded in 2015. In a short period, the company implemented 19 projects in different regions of Ukraine with total Biomass and Landfill Biogas installed capacity of 20 MW. Annual electricity production is up to 100 million kWh.

The number of employees increased from 5 people (mid-2015) to more than 600 people, half of whom are employed in the field of renewable energy and the other in the field of waste management.

The first stage of the pilot project on gasification of fuel chips has been successfully implemented.

Clear Energy Group has 5 projects in development with total capacity up to 150 MW (WPP, SPP, gasification, etc.).

Operations and Maintenance of two landfill sites has begun (Odessa, Ternopil).



THE COMPANY PRODUCED 91 MLN. KW OF GREEN ENERGY DURING 2020.
FACILITIES ARE LOCATED IN 15 CITIES OF UKRAINE (BY NOW).



HISTORICAL DATA ON GROWTH OF THE COMPANY ENERGY FIELD



KORYUKIVKA TPP 4 MW PROJECT

- Electric power: **4 MW**;
- Type of fuel: **wood chips**;
- Annual biomass demand: **up to 60 thousand tons per year**;
- Annual electricity production: **up to 29 million kWh**.



WOOD CHIPS GASIFICATION PROJECTS

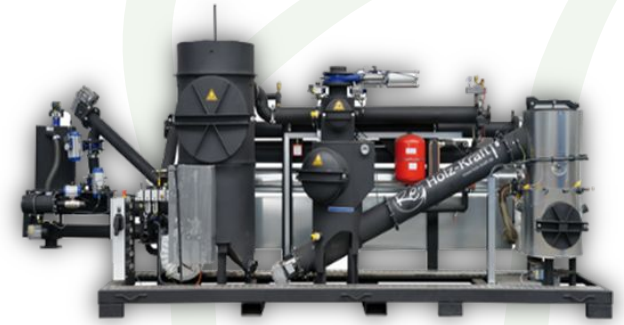
Clear Energy LLC has implemented a pilot project of green energy and put into operation a mini-thermal power plant that runs on biogas generated from wood chips:

- ✓ The electric power of the station is **490 kW**
- ✓ Thermal power is **800 kW**

Ability to sell heat at a price 25% lower than natural gas combustion.

This process under **conditions of complete automation** and minimization of the human factor during energy generation.

The consumption of fuel chips for the production of a unit of energy is **reduced twice** than for other types of cogeneration, including the steam turbine cycle.



The operation of one power plant replaces the use of natural gas with volumes up to 2 million m³ / year and this is only for the needs of hot water supply in one Chernihiv area



MUNICIPAL SOLID WASTE LANDFILL DEGASSING PROJECTS

The company is actively implementing projects for the degassing of landfill sites and the production of landfill gas (biogas). **Today, Clear Energy is Ukraine's leading company that manages landfill gas.**

Cities: Chernihiv, Kharkiv, Kryvyi Rih (2 objects), Ivano-Frankivsk, Lutsk, Khmelnytsky, Kremenichuk, Poltava, Kherson, Bila Tserkva, Dnipro, Odessa, Ternopil. Also, in the development is landfill in Lviv city.

Now, 14 plants have been put into operation that successfully generate and sell electricity to the grid at a feed-in tariff (0,1239 EURO per kW).

These projects were implemented in short terms not exceeding 4 months each.



LANDFILLS DEGASSING PROJECTS IN CITIES: KREMENCHUK, IVANO-FRANKIVSK, KRYVYI RIH, KHARKIV, KHERSON

Ivano-Frankivsk 0,66MW



Kryvyi Rih 1,063MW



Kremenchuk 0,845 MW



Kharkiv 1,908 MW



Kherson 0,625 MW



LANDFILLS DEGASSING PROJECTS IN CITIES: CHERNIHIV, LUTSK, KHMELNYTSKY, POLTAVA



PROJECT ON DEGASSING OF SOLID WASTE LANDFILL IN ODESSA

CAPACITY OF 3.5 MW



Degassing station built in 90 days

PROJECT ON DEGASSING OF SOLID WASTE LANDFILL IN TERNOPIL (LAUNCHED IN 2021)

CAPACITY OF 659 kW



PROJECTS FOR THE COLLECTION, TRANSPORTATION, MANAGEMENT OF MUNICIPAL SOLID WASTES AND LANDFILL MANAGEMENT

SOYUZ LLC is a leader in Odessa for the provision of municipal solid waste and bulky waste collection and transportation services.

The company has been working in this field for about 20 years

The total share of Soyuz LLC in the waste collection and transportation market in Odessa is approximately 65%

Main assets of the company include:

- ✓ **46 units** of special machinery (garbage trucks);
 - ✓ **14 tractor** units with a boat type container;
 - ✓ **about 7000 units landfill containers.** – ТОННЫ И ГЕКТАРЫ
- The total area of the landfill is 96.2 hectares
 - The yearly volume of incoming solid waste is about 326 thousand tones



WASTE MANAGEMENT PROJECT IN TERNOPIL CITY

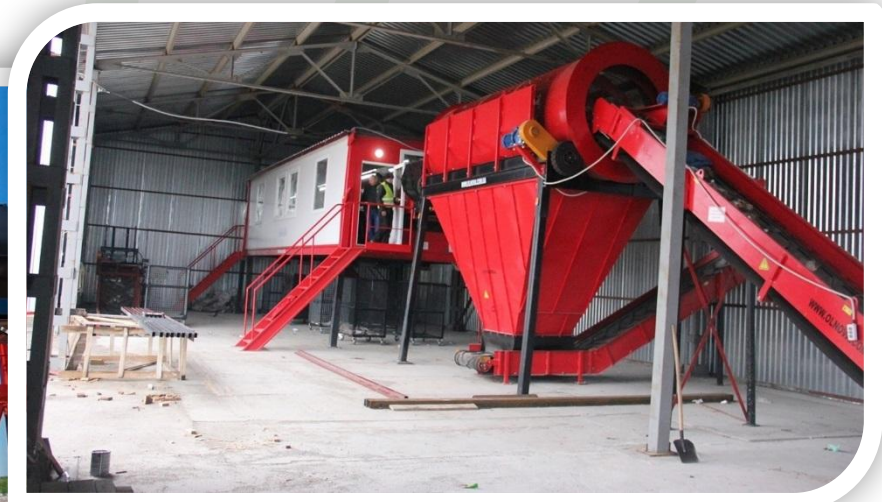
Subsidiary LLC "ECO-LEADER T" is a modern European company in Ternopil for the provision of services for the collection and disposal of solid household waste (MSW).

The company manages the only landfill for solid household waste in Ternopil.

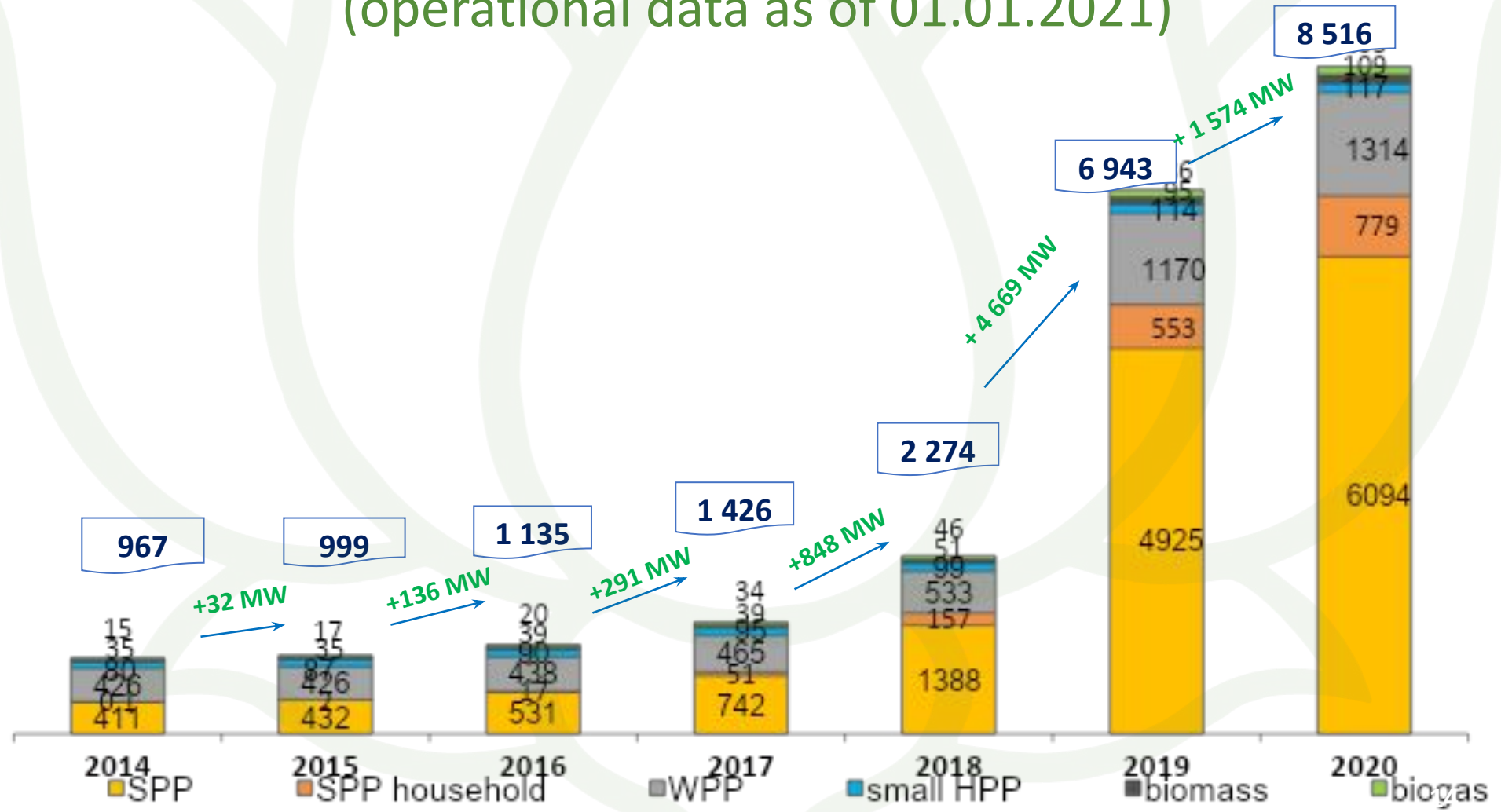
- **The yearly volume of incoming solid waste is about 135 thousand tones**
- **The total area of the landfill is 17,5 hectares**

Main directions of development:

- Construction of a sorting line on the territory of the solid waste landfill;
- Improving the operating mechanism of the landfill, enhancing with high-quality equipment;
- Creation of a European level landfill.

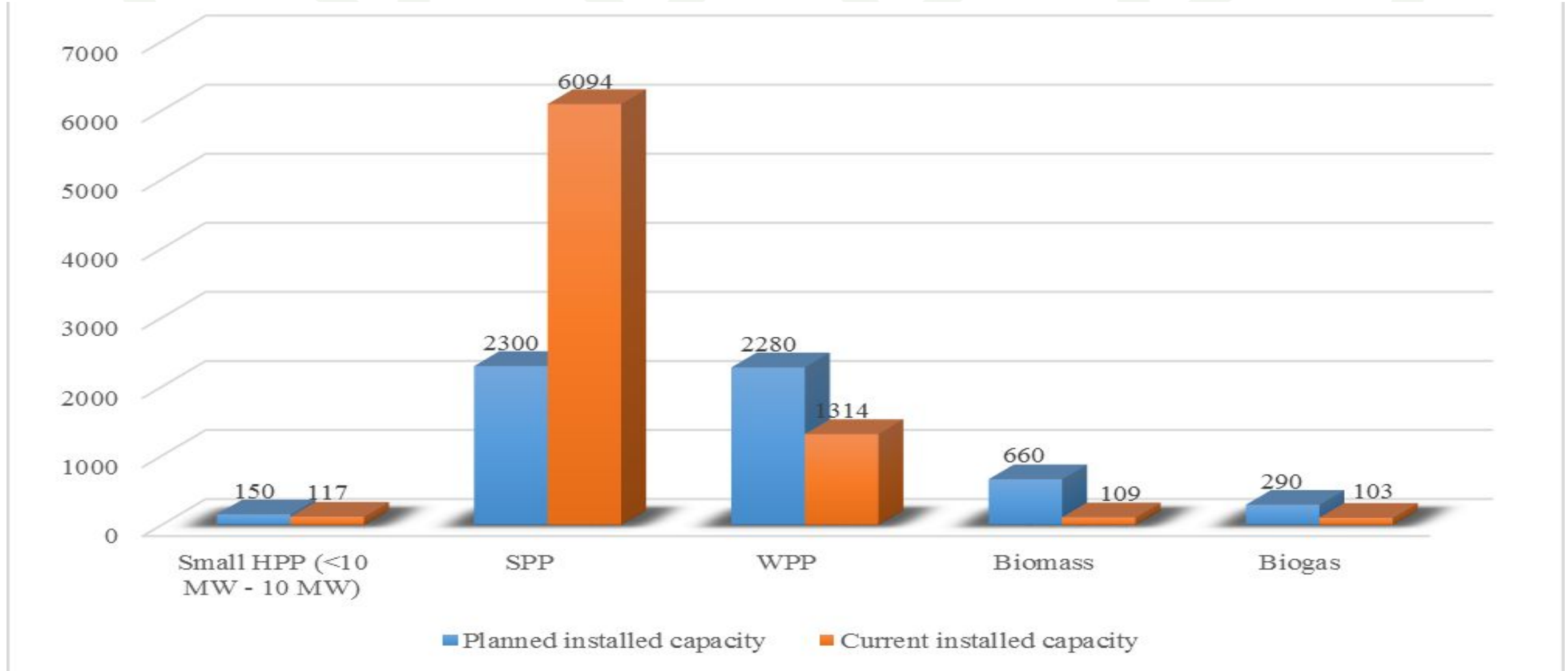


INSTALLED CAPACITY OF RENEWABLE ENERGY FACILITIES OPERATING AT THE "GREEN" TARIFF IN UKRAINE, MW (operational data as of 01.01.2021)



Since the beginning of 2015, 7,549 MW have been commissioned and about € 6.2 billion of investments have been attracted

GOVERNMENT'S NATIONAL RENEWABLE ENERGY ACTION PLAN TILL 2020 – implemented as of 31.12.2020 – installed capacities in MW



CLEAR ENERGY'S PROJECTS IN DEVELOPMENT IN UKRAINE

1. Renewable energy projects that generate energy from biomass (waste wood)

- Pipe-line of 4 biomass CHP/TPP projects on waste wood (wood chips) in regions of Ukraine with high resource potential for biomass – Zhytomyr and Chernihiv;
- For projects in Chernihiv and Zhytomyr CE is leading negotiations with the Polish banks: BGK and Pekao;
- The EPC contractor could be the Polish company UNIBEP;
- We are also considering the possibility of implementing similar projects in other regions of Ukraine.

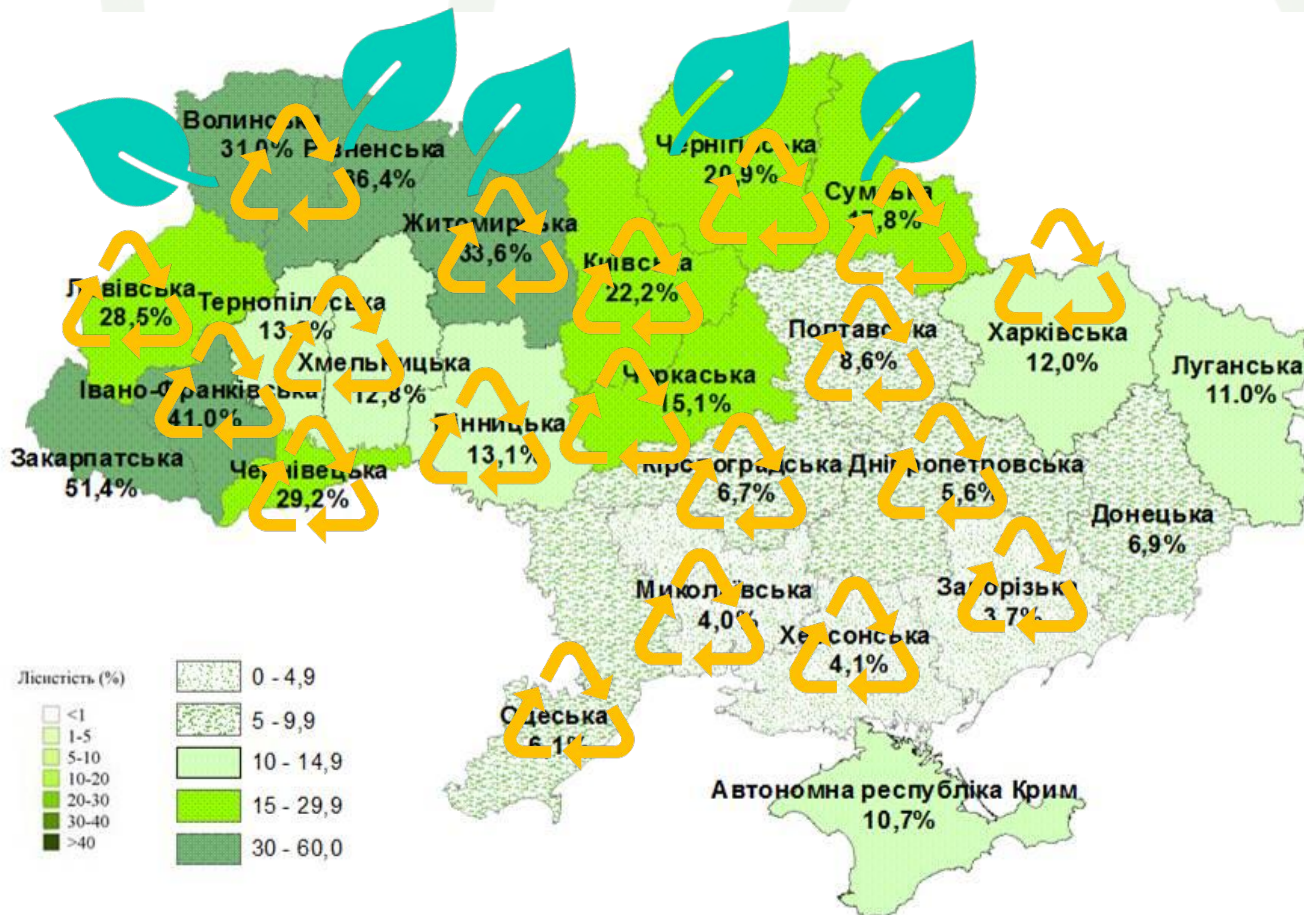
Region	City	Installed capacity, MW	Potential CAPEX (incl. VAT), mln EUR	Potential payback period, years	Potential project IRR	Project EBITDA (average for 5 years), mln EUR
Chernihiv	Koryukivka	6 (el.)	13,2	3,6	24 %	3,4
Chernihiv	Chernihiv	12 (el.) + 20 heat	26,5	3,5	25 %	7,2
Zhytomyr	Zhytomyr 1	6 (el.) + 12 heat	14	3,9	22 %	3,3
Zhytomyr	Zhytomyr 2	12 (el.) + 20 heat	27,4	3,7	24 %	7,2
Total		36 (el.) + 52 heat	81,1	3,6		21.1

POTENTIAL COGENERATION PROJECTS ON BIOMASS



POTENTIAL COGENERATION PROJECTS IN UKRAINE

In regions where there is a sufficient amount of biomass, projects for the production of heat and electricity from biomass (wood chips) should be considered together with waste-to energy projects on solid fuel (RDF*) in regional centers with district heating, where there is a sufficient amount of waste.



- Forest cover of Ukraine is 15.9%
- Ukraine ranks 9th in Europe in terms of forest area
- 6th place in terms of wood stocks
- In last 50 years, forest cover has increased almost one and a half times in Ukraine



- CHP on biomass



- Waste to energy CHP on RDF

*** Refuse-derived fuel (RDF) is a fuel produced from various types of waste such as municipal solid waste (MSW), industrial waste or commercial waste.

POTENTIAL WASTE TO ENERGY PLANT SIMILAR TO POZNAŃ WASTE TO ENERGY PLANT

Benefits from Waste-to-energy plant:

- ❑ Replacement of expensive gas in heat production
- ❑ Reduction of solid waste and landfill volumes
- ❑ Reducing the cost of heat for the urban community up to 10%



DRAFT LAW FOR ENERGY EFFICIENT DISPOSAL (UTILIZATION) OF MUNICIPAL SOLID WASTE IN UKRAINE

Draft Law 5611 dated 03.06.2021 for the support of Waste-to-Energy projects was registered in Ukrainian Parliament http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=72128

Main goals of the Draft Law implementation:

Heat

Tariffs for heat from waste (SRF / RDF) are set at 90 percent of the current tariff for heat produced using natural gas.

Electricity

The tariff for electricity generated from renewable fuel from waste (SRF / RDF) is set at the weighted average auction price of the previous year, at which the guaranteed buyer buys electricity from producers who produce electricity from biomass and biogas.

2. Bioethanol production plant projects

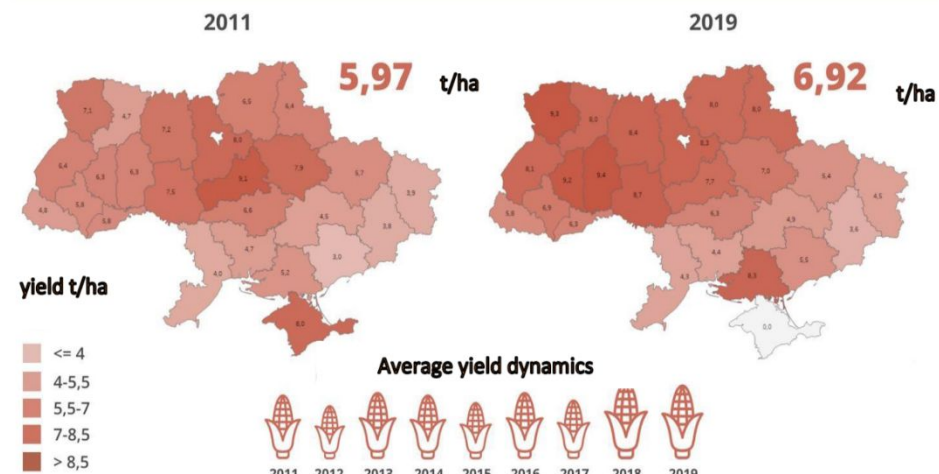
- One of the prioritized sectors for CE growth is the development of bioethanol production facilities in Ukraine.

Resource base in Ukraine for bioethanol production

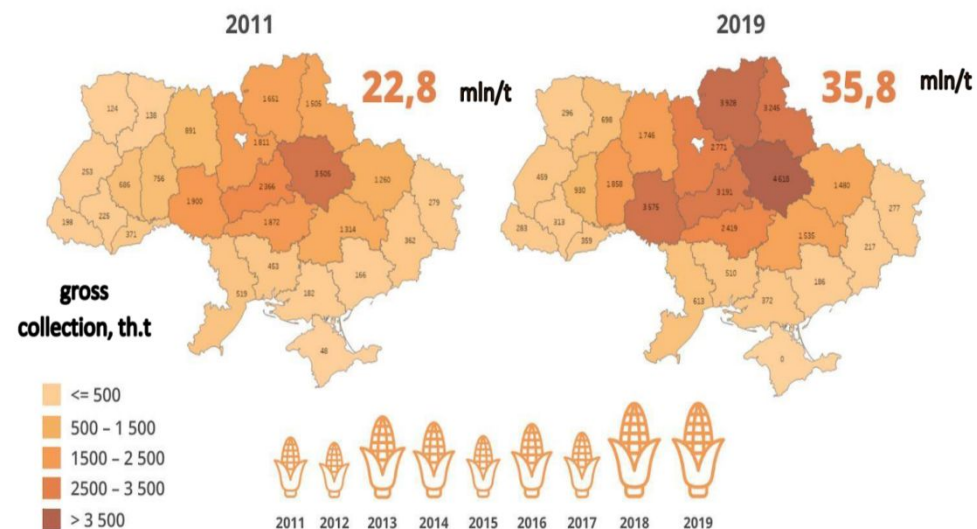
In Ukraine, the area under corn occupies around 5 million hectares with harvesting of 30-36 million tons annually. In addition, Ukraine is one of the largest suppliers of corn on the world market and in 2019 it was exported 32 million tons of corn.



Amount of corn grown in t / ha by regions of Ukraine



Harvest of corn in Ukraine by region in t / ha

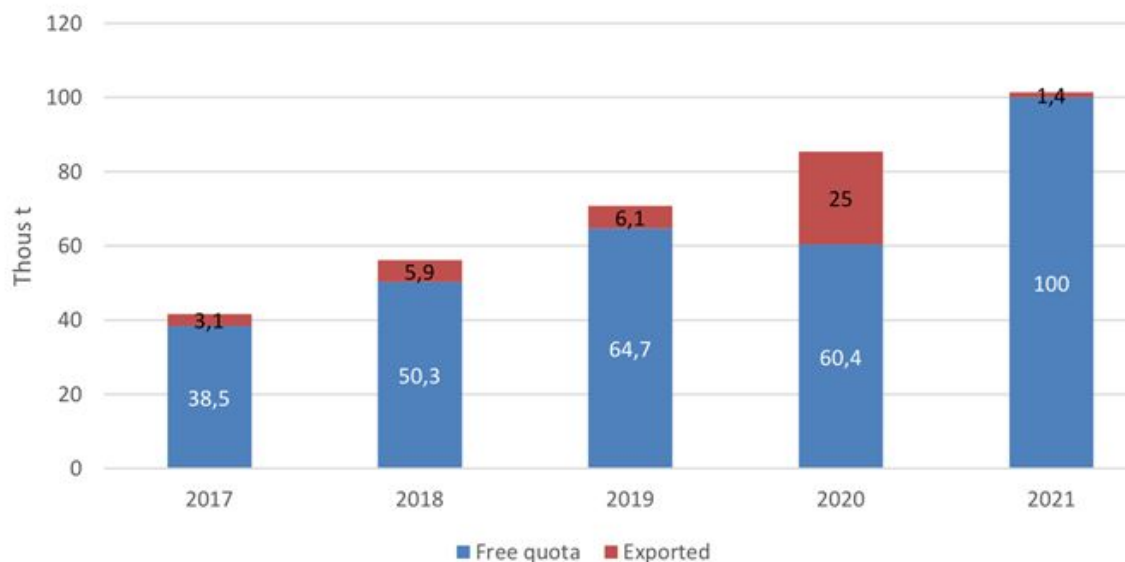


□ Foreign markets for bioethanol

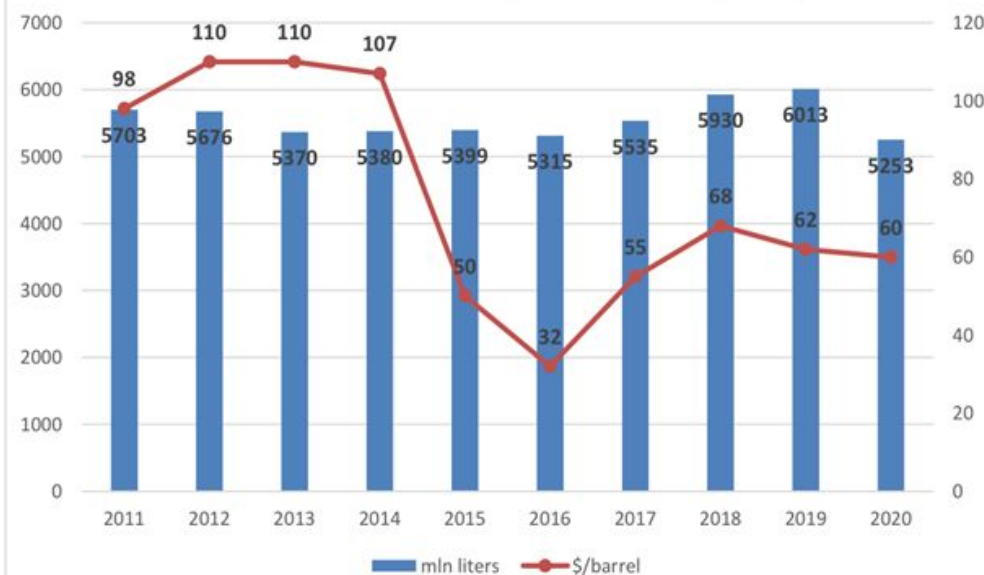
The duty-free export quota for selling bioethanol from Ukraine to EU is 100 k tonnes annually (starting from 2021).

This quota has not been fulfilled yet in recent years of its availability. As it can be seen from the graph 2, bioethanol consumption in EU has an upward trend with exception of year with COVID-19 impact in 2020. It is predicted that due to EU policies the consumption level will continue to grow.

Duty-free quota for ethanol from Ukraine to EU,
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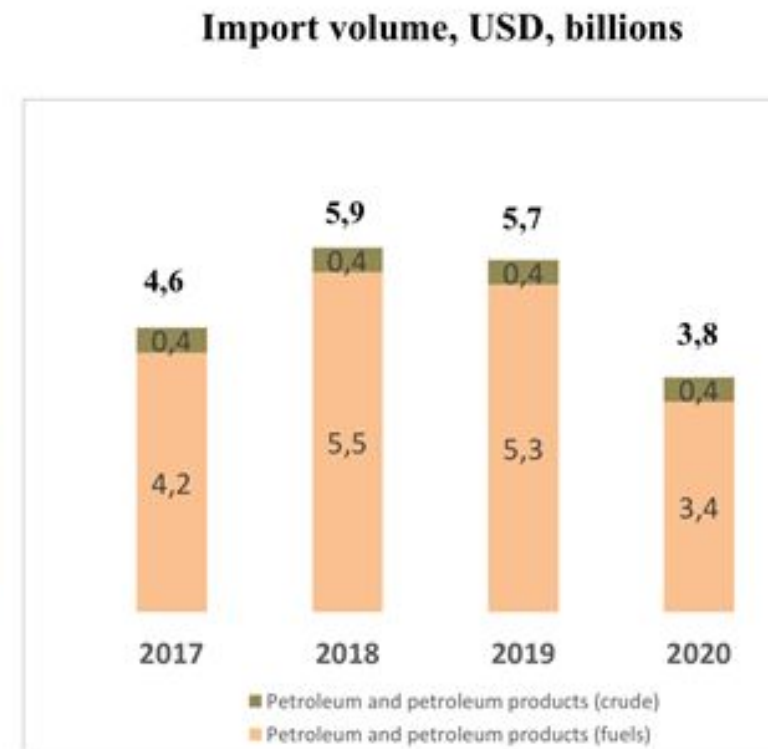
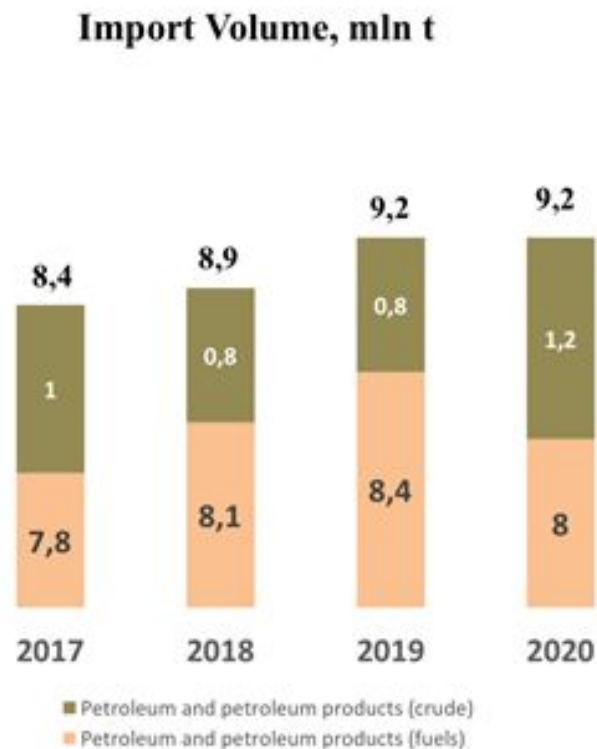
EU bioethanol consumption in 2011-2020, million liters and
correlation with oil price, \$ / barrel (Brent)
and correlation with oil price, \$ / barrel (Brent)



□ Ukrainian market for bioethanol

The Ukrainian transport fuel market is highly dependent on foreign markets - more than 50% of domestic gasoline consumption and about 90% of diesel fuel are met through imports.

Every year Ukraine imports more than 9 mln tonnes of oil products, of which 8 mln tonnes is fuel for commercial use (or 89% from the total imports of oil products).



2. Project for the production of bioethanol

CE is developing a bioethanol production project that will be constructed from “Greenfield”.

The plant will produce 27,6 k tonnes of bioethanol annually, while consuming 84 k tonnes of corn annually. Additional by-products annual production will be: DDGS – 27 k tonnes, liquefied CO₂ – 17,5 k tonnes and corn oil – 900 tonnes. These by-products will provide 25% of revenue, other 75% of revenue will be obtained from bioethanol selling on EU markets.



Estimated project cost (incl. VAT)	32,1 mln EUR
Loan funding 70%	22,5 mln EUR
Own funds 30%	9,6 mln EUR
Estimated project payback period, years	3,63 years
Project IRR	20,8 %
EBITDA (average for 5 years)	8 mln EUR



**CLEAR
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We hope for the successful, mutually beneficial and long-term cooperation!

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