



UKRAINE:

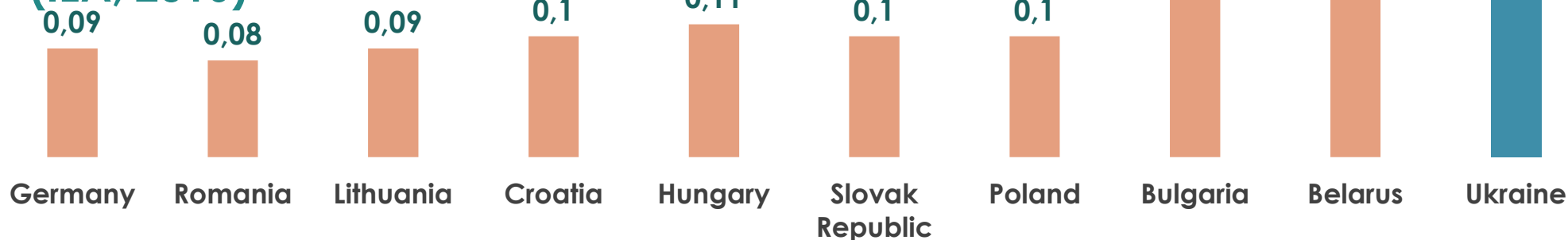
ENERGY EFFICIENCY and RENEWABLE ENERGY

State Agency on Energy Efficiency
and Energy Saving of Ukraine



ENERGY EFFICIENCY AND RENEWABLE ENERGY SECTORAL POLICIES

Energy intensity in European countries (IEA, 2016)



34%

29%

13%

18%

6%

Households

- State and local programs of co-financing of energy efficiency
- Households stimulation on installation of wind and solar plants
- Energy labelling systems
- Full metering of energy consumption
- Stimulation of recipients of subsidies to save energy

Industry

- Stimulation through energy tax
- Energy Performance Contracts

Services, Public Entities and Agriculture

- Energy Performance Contracts
- The mechanism of energy management

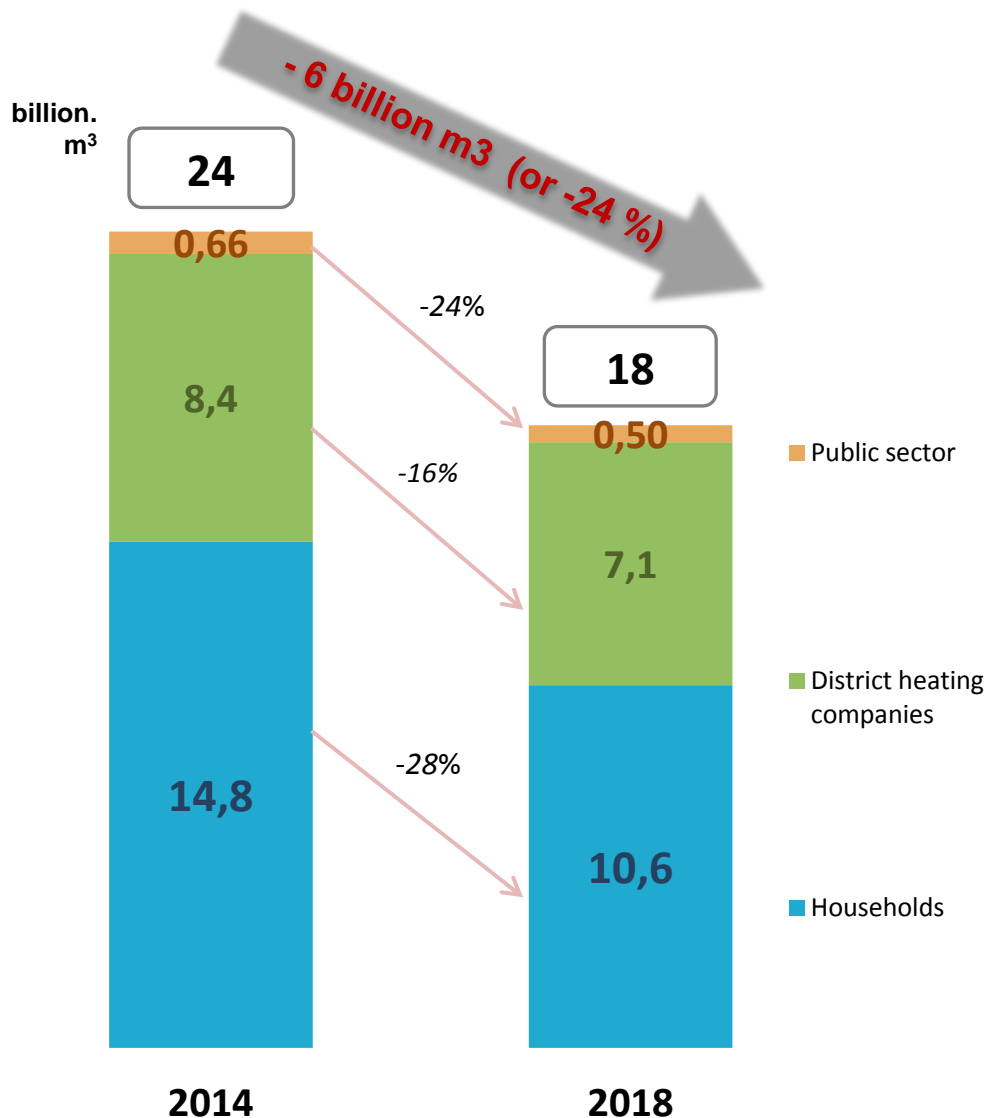
Transport and Non-energy use

- Stimulation of liquid biofuels production
- Extension of electric vehicles usage



MAIN PRIORITY: NATURAL GAS SAVING

Dynamics of natural gas consumption in 2014-2018*



* according to operational data of NJSC "Naftogaz of Ukraine" and PJSC "Ukrtransgas" (without temporarily occupied territories)

Achievements in 2014 – Q1 2019:

Invested in Ukrainian "clean" energy projects

$\Sigma \approx 2.7$ billion €

IN RENEWABLE ENERGY:

2 222 MW of new heat capacities

Investments – **505 million €**

2 202 MW of new renewable energy capacities

Investments – **2 billion €**, including:

→ **8 843** of households installed SPP with total capacity – **190 MW**

Investments – **180 million €**

IN ENERGY EFFICIENCY:

571 000 of families implemented energy efficiency measures via "warm" loans in the residential sector

Investments – **223 million €**

332 ESCO-contracts are concluded in the public sector

Investments – **14,5 million €**





CURRENT STATUS OF ENERGY EFFICIENCY AND RENEWABLE ENERGY IN UKRAINE

National Renewable Energy Action Plan-2020

11% of Renewables in final energy consumption

Energy Strategy of Ukraine till 2035

25% of energy, produced from RES
in the structure of primary energy supply

€ 30 bln

National Energy Efficiency Action Plan-2020

of energy saving comparing to the
average final energy consumption in
2005-2009

9%

Potential directions of investment attraction

Necessary investments by 2035 for:



construction of **renewable energy facilities**
(SPP, WPP, small HPP, CHP, biomass boiler
station,
biogas facilities, etc.)



construction of capacities for production of
equipment for renewable energy facilities



construction of **biofuel production plants**
(solid, liquid)



growing of **energy crops**



Residential sector – continuation of state program
for stimulating households to implement
energy efficiency measures

€ 44 – 74 bln – investment potential



Industry – state support for realization of energy
efficiency
measures

€ 2,3 bln – investment potential



Public sector – development of EPC market

€ 8 bln – investment potential



ENERGY EFFICIENCY IN BUILDINGS



Residential buildings		Public entities
Multi-Storey	Private (Individual)	
Number of Buildings		
≈ 80 000	≈ 6,5 mln	≈ 100 000
Necessary Investment		
≈ from 50 to 85 bln USD*		≈ from 4 to 8 bln USD*
Annual Saving Potential (in gas equivalent)		
8 bln cubic meters		800 mln cubic meters



*depending on the thermal modernization level



ENERGY PERFORMANCE CONTRACTING FOR PUBLIC SECTOR

2016:

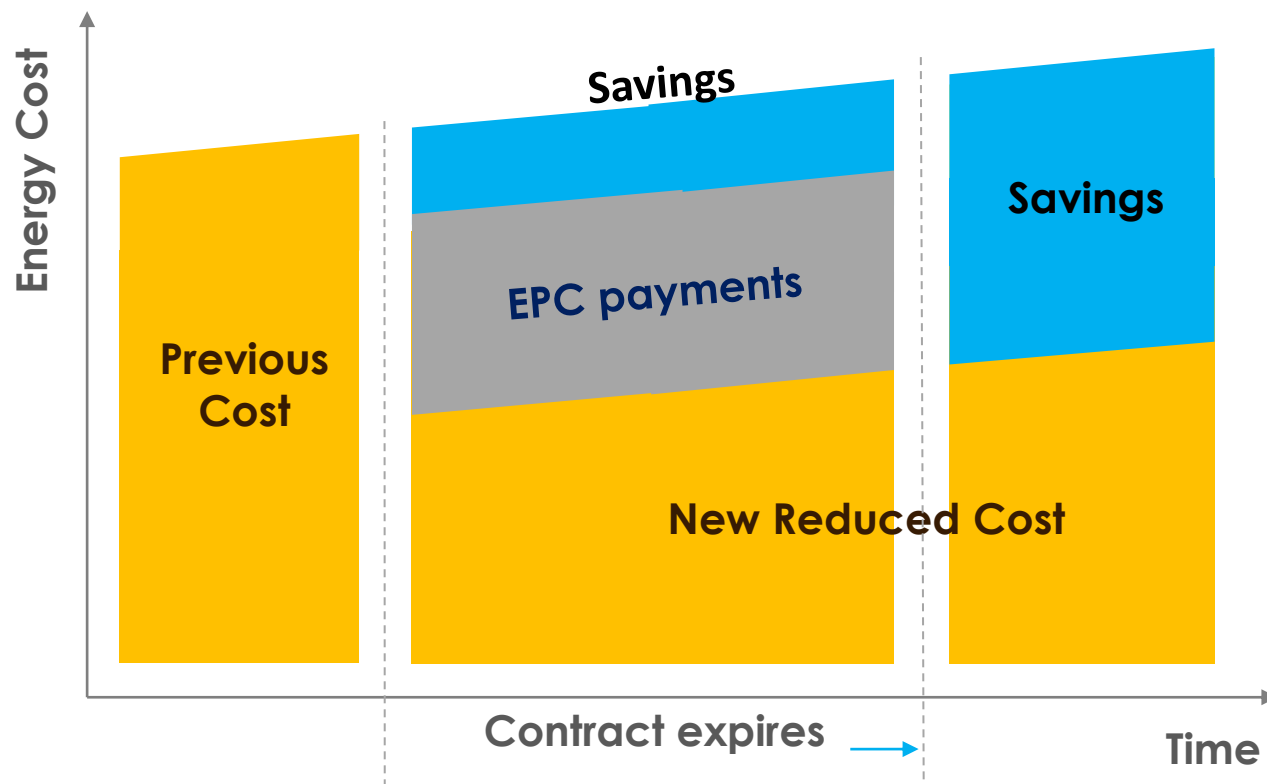
first 20 EPCs worth
18 million UAH were
concluded

2018:

210 EPCs worth
218 million UAH
were concluded

2019:

102 EPC contracts worth
194,5 million UAH were
concluded

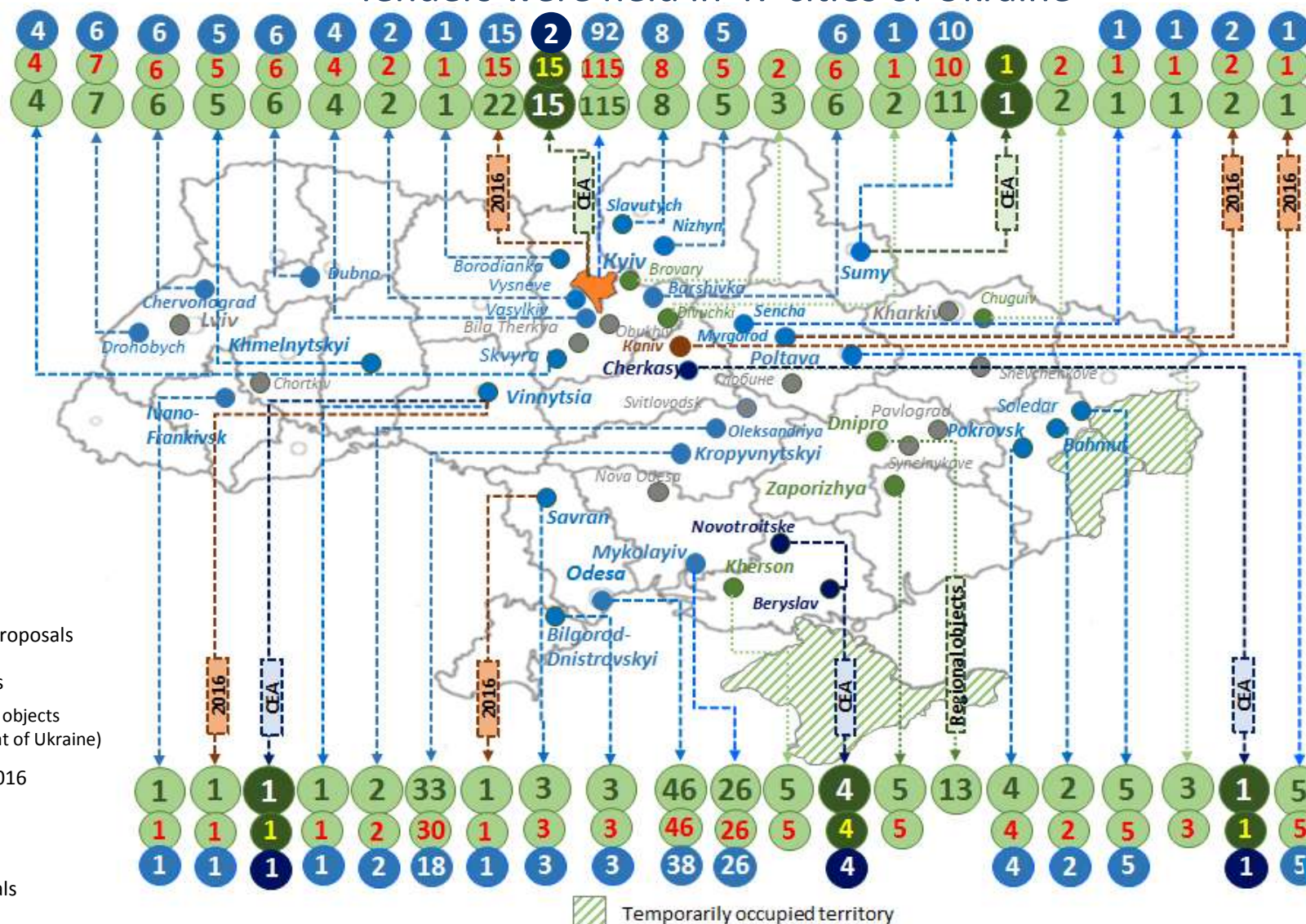


The appropriate laws and regulations developed with support of EBRD have been adopted. That gives the guarantee for investments return in the framework of state budgetary commitments.



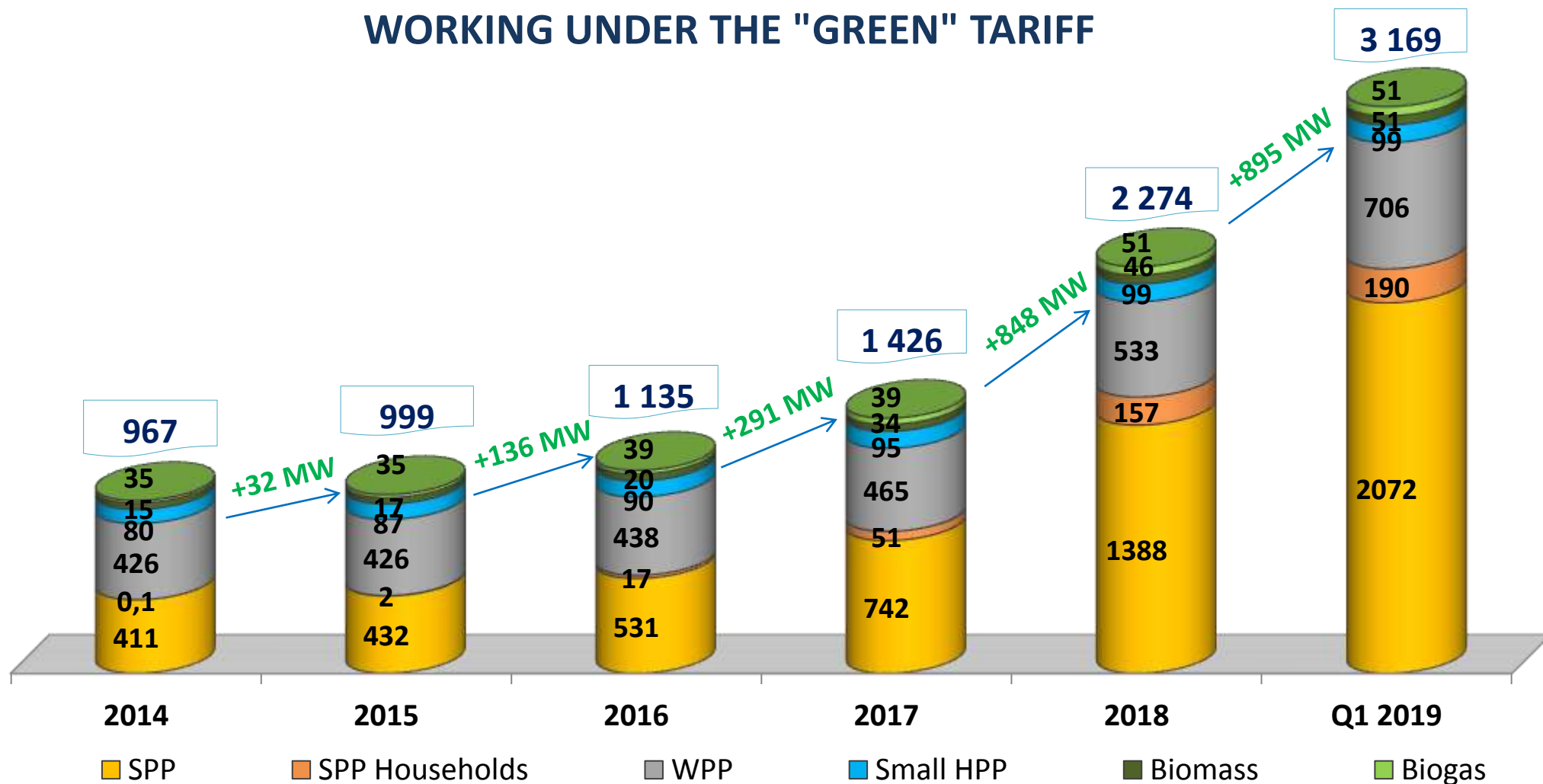
332 EPC-contacts have been concluded on more than 14.5 million EURO (70% of which was signed last year)

Tenders were held in 47 cities of Ukraine





INSTALLED CAPACITY OF RENEWABLE ENERGY OBJECTS WORKING UNDER THE "GREEN" TARIFF



From the beginning of 2015, 2 202 MW were introduced and around € 2 bln were invested.

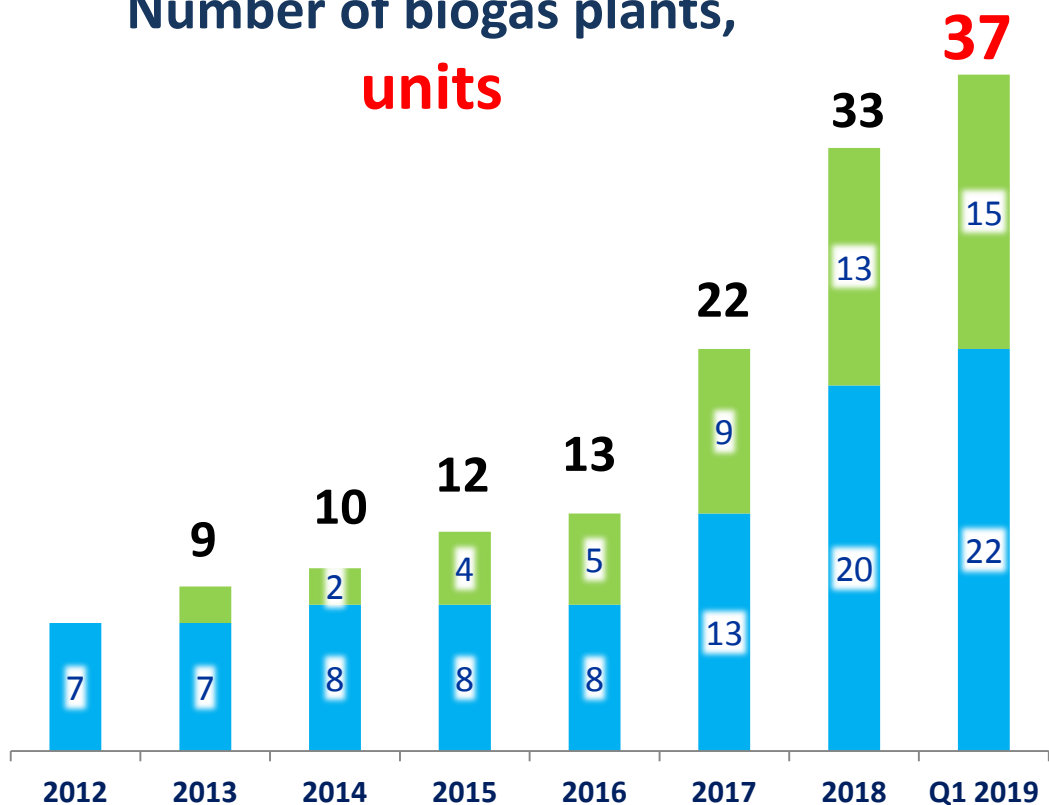




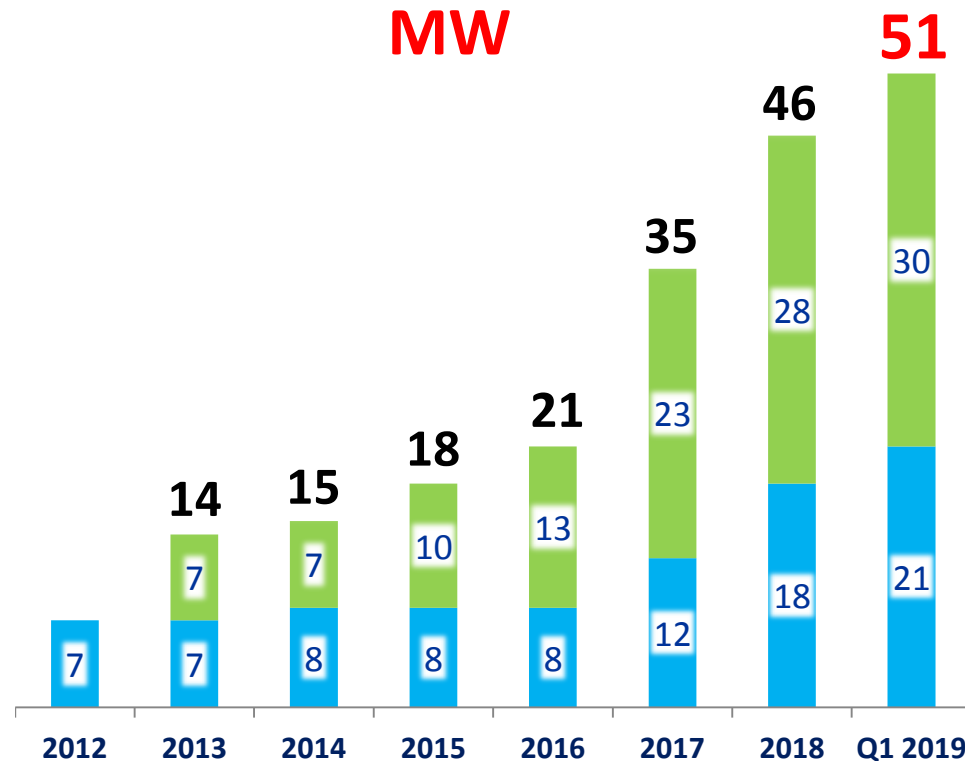
BIOGAS CAPACITY INCREASE IN UKRAINE

(biogas plants operating under the feed-in tariff)

Number of biogas plants,
units



Installed capacity,
MW



■ - biogas from
agricultural waste

■ - biogas from landfills





NEW RENEWABLE ENERGY INCENTIVES INTRODUCTION

Conducting pilot
auctions

Revision of the auctions
conducting order

Auctions holding
period

07.2019

Law
adoption

2020

2030



PPA terms
20 years



Obligatory participation:

from 2020:



SPP \geq 1 MW;



WPP \geq 5 MW;

Other key points:

All types of RES
will participate
in auctions

Electronic Trading
System

PROZORRO

Financial guarantee
15 000 € for 1 MW
Land and
Specifications for
accession

Premium for the
use of Ukrainian
equipment **5%** -
10% (current law)

Specifications are valid:
SPP – up to 2 years;
WPP, CHP on biomass,
small HPP – up to 3
years

10/



PROPOSALS FOR OPTIMIZATION «GREEN» TARIFF

	Law in force 2020	Draft law 8449-d			
		2020	2021	2022	2023
SPP	-10%	-25%	-2,5%	-2,5%	-2,5%
WPP	-10%	-10%	-	-	-
SPP households	- 10%	-10%	-	-	-
Hybrid (SPP+WPP) households	-	Introduction "green" tariff (12,28 €ct/kW*h)			
Biomass	-10%	The tariff unchanged and staying at the level of 2019 (12,39 €ct/kW*h)			



DRAFT LAW OF UKRAINE ON DEVELOPMENT OF THE PRODUCTION OF LIQUID BIOLOGICAL FUELS SPHERE

GOAL:

Creating legislative basis for liquid biofuel production and its use in transport

Draft Law provides :



Obligatory quotas on the biocomponent share in the volume of sold motor fuel:

For Gasoline

From January 1, next year after the adoption -

not less than **5 %** volume (**3,4 %** energy)

From January 1, two years after adoption -

not less than **7 %** volume (**4,8 %** energy)

For Diesel

From January 1, next year after the adoption -

not less than **3 %** volume (**2,7 %** energy)



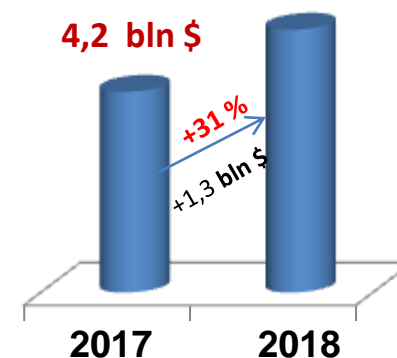
Responsibility for non-compliance with quotas



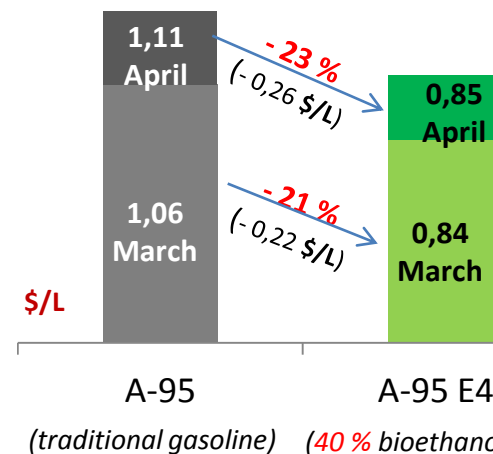
From January 1, next year after the adoption, biocomponents must meet sustainability criteria

Import of crude oil and refined products*

4,2 bln \$
5,5 bln \$



Prices for traditional gasoline and with the addition of bioethanol **



* According to the State Fiscal Service of Ukraine

** as of 24 of March, 2019, 1\$=26,3 UAH, 22 of April 2019, 1\$=26,6 UAH



Current situation in Ukraine with generation of household solid waste (HSW) Annually:

300 – 350 kg
of household solid waste



is produced by one
person in Ukraine

10 mln tons
of household waste



removed to the landfills in Ukraine

gas equivalent
≈ 1 bln m³



3,5 mln Gcal
of thermal energy



1,2 billion kWh
of electric energy





EXAMPLES OF SUCCESSFUL RENEWABLE PROJECTS

Combined Heat & Power (CHP) on renewable fuels



CHP provides heat and electricity:

190 residential buildings (**22 000** dwellers);
3 kindergartens; **5** schools.

City: **Kamyanets-Podilskyi**

Capacity: **45 MW** including:

15 MW – solid bio fuel boiler (5 and 10 MW);
1,8 MW – turbine with ORC module (solid bio fuel);

Fuel: **wood chips, pellets**

Substitution: **8,4 mln m³** of natural gas annually

Investments: **8,2 mln EUR**

Solar panel production plant



The largest solar panel production plant in Ukraine

City: **Vinnytsia**

Power: **200 MW** - 1st stage
(total - **400 MW**)

Put into operation: **2019**

New working places: **120**

Investments: **5 mln EUR**

Investor: **KNESS Group**

Wind power turbines production plant



Under license of German company Fuhrlaender AG

City: **Kramatorsk**

Power of turbines: **2.5 - 3.2 MW**

Planned: **4.1-4.5 MW**

Built: **77 turbines in Ukraine and 22 turbines in Kazakhstan**



EXAMPLES OF SUCCESSFUL RENEWABLE PROJECTS

Teofipol biogas complex 15 MW



Town: **Teofipol, Khmelnytskii region**

Type of fuel: **sugar beet pulp, corn silage**

Electricity production: **15 MW**

- 5 MW (first line working on sugar beet pulp);

- 10 MW (second line working on corn silage).

Heat production: **15 MW**

Investments: **40 mln EUR**

Equipment: **Jenbacher (Austria)**

Plant for landfill gas degassing



City: **Khmelnitskii**

Start of operation **2017**

Capacity: **659 kW**

Electricity production:

5,13 kWh/year

Investments: **34 mln UAH**

(1,1 mln EUR)

Investor: **Biogas Energy (Ukraine)**

Energy willow (SALIX energy)



Region: **Volyn and Lviv**

Company: «**SALIX energy**»

Plantations area: **1 700 ha**

Crop capacity: **20 t/ha**

Annual growth: **34 000 t/year**

Crop capacity cycle: **25 years**

Heat of combustion:

17,3-18,0 MJ/kg



UAMAP comprises detailed information on

95 implemented and

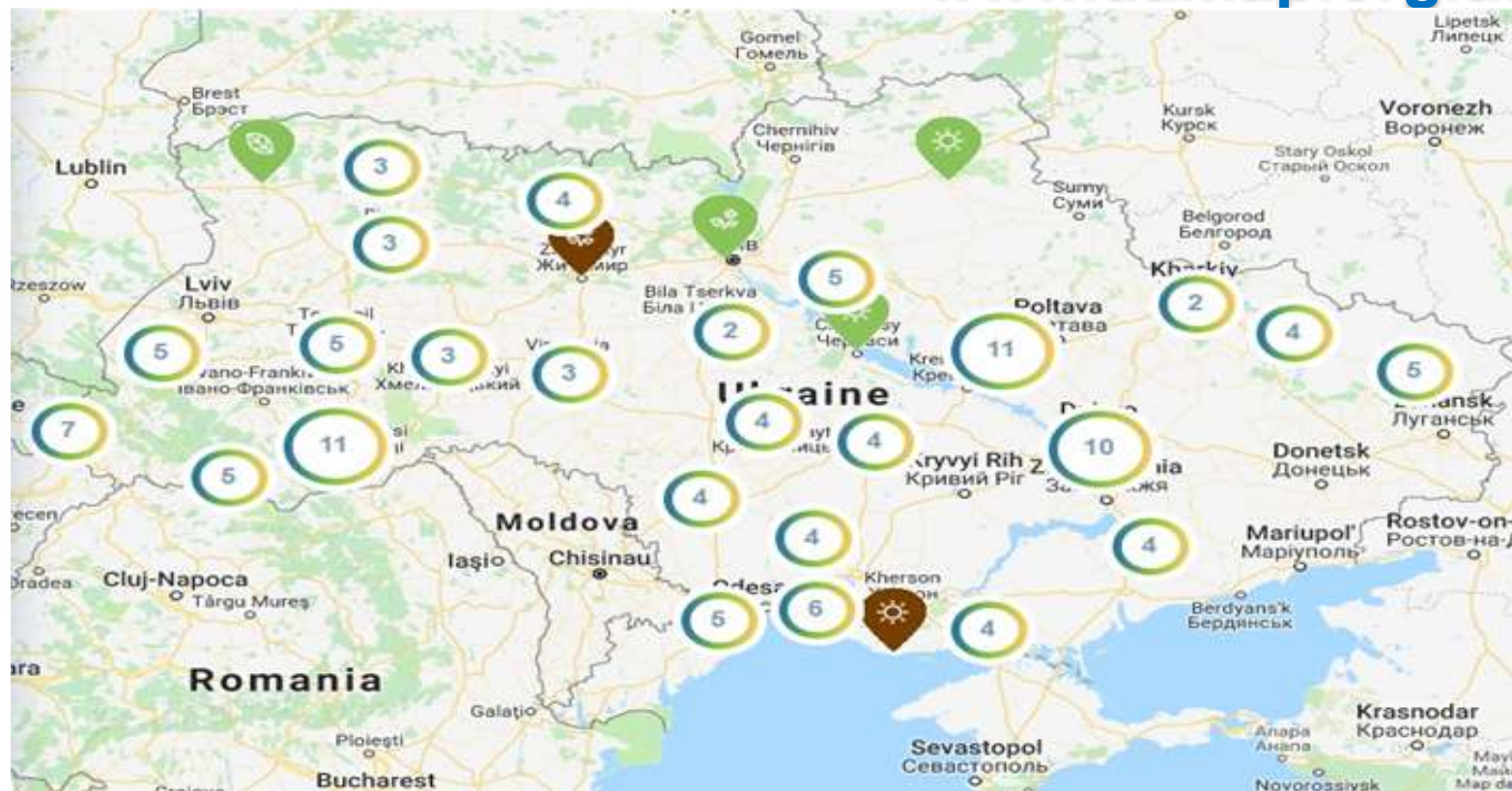
106 potential projects that require

investments

€ 4 bln

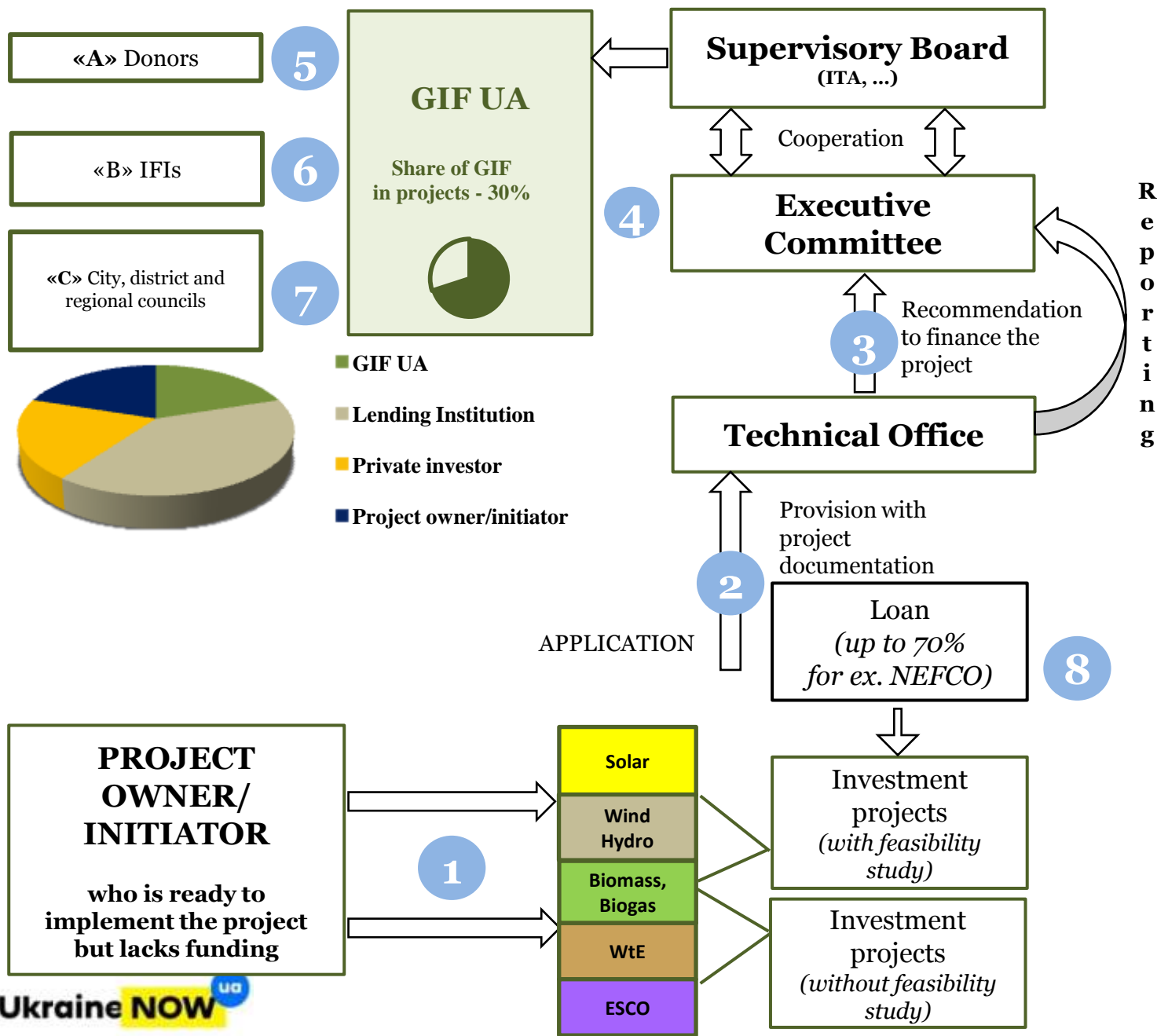
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	Biomass	<input checked="" type="checkbox"/>
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	Wind power	<input checked="" type="checkbox"/>
	Energy efficiency	<input checked="" type="checkbox"/>
	Waste energy	<input checked="" type="checkbox"/>
	Other	<input checked="" type="checkbox"/>





GIF UA: SCHEME OF OPERATION IN BRIEF



- 1 Customer appeals to GIF and selects interesting project(s) or offers his own.
- 2 Application Form is processed by Technical Office of GIF
- 3 Decision on the type of financing and interaction model with a project
- 4 GIF assesses and offers its equity share in RES project
- 5-6-7 Stakeholders invest in GIF UA
- 8 Banks give loans to the new projects





INVEST in UKRAINE!

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