



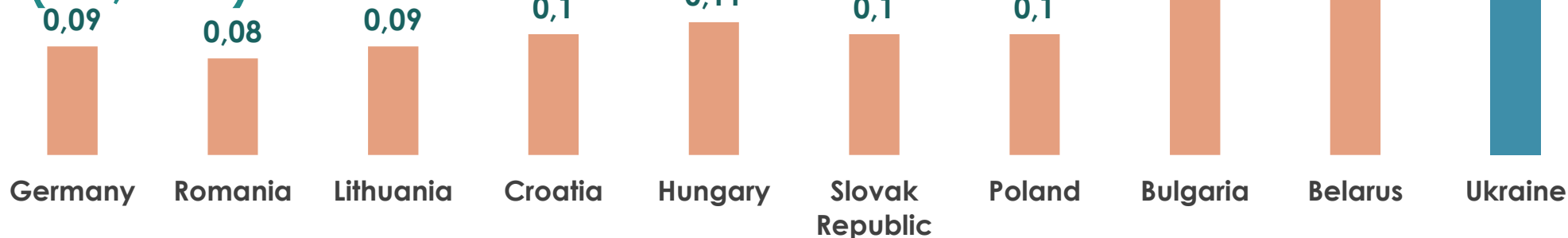
UKRAINE: RENEWABLE ENERGY

State Agency on Energy Efficiency
and Energy Saving of Ukraine



ENERGY EFFICIENCY AND RENEWABLE ENERGY SECTORAL POLICIES

Energy intensity in European countries (IEA, 2016)



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

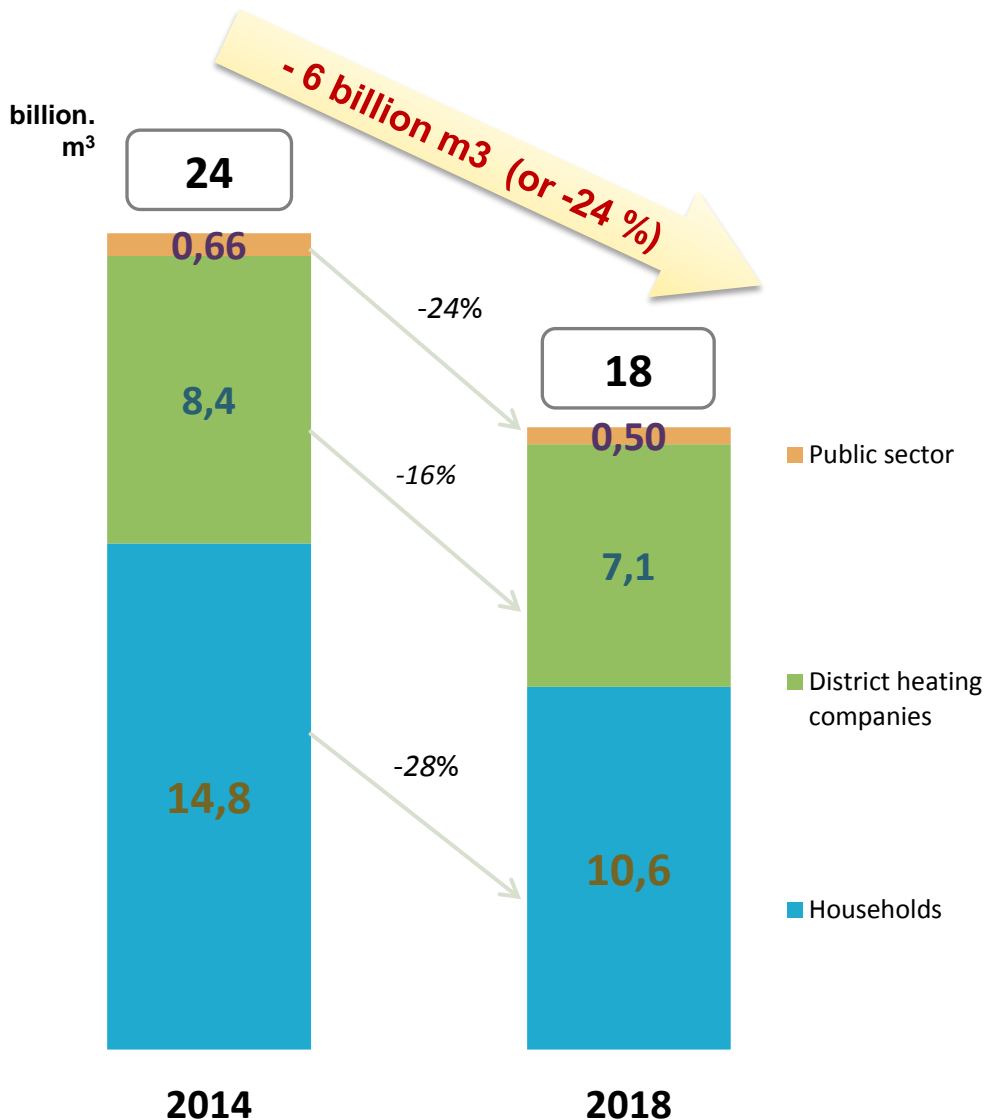
- Stimulation of liquid biofuels production
- Extension of electric vehicles usage





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 – Q3 2019:

Invested in Ukrainian "clean" energy projects

$\Sigma \approx 4.1$ billion €

IN RENEWABLE ENERGY:

2 282 MW of new heat capacities

Investments – **524 million €**

3 899 MW of new renewable energy capacities

Investments – **3.3 billion €**, including:

↳ **11 888*** of households installed SPP with total capacity – **276 MW**

Investments – **240 million €**

IN ENERGY EFFICIENCY:

682 609 of families implemented energy efficiency measures via "warm" loans in the residential sector

Investments – **278 million €**

361 ESCO-contracts are concluded in the public sector

Investments – **19,2 million €**

*Q2 2019





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

€ 20 bln

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**

National Energy Efficiency Action Plan-2020

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

9%



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



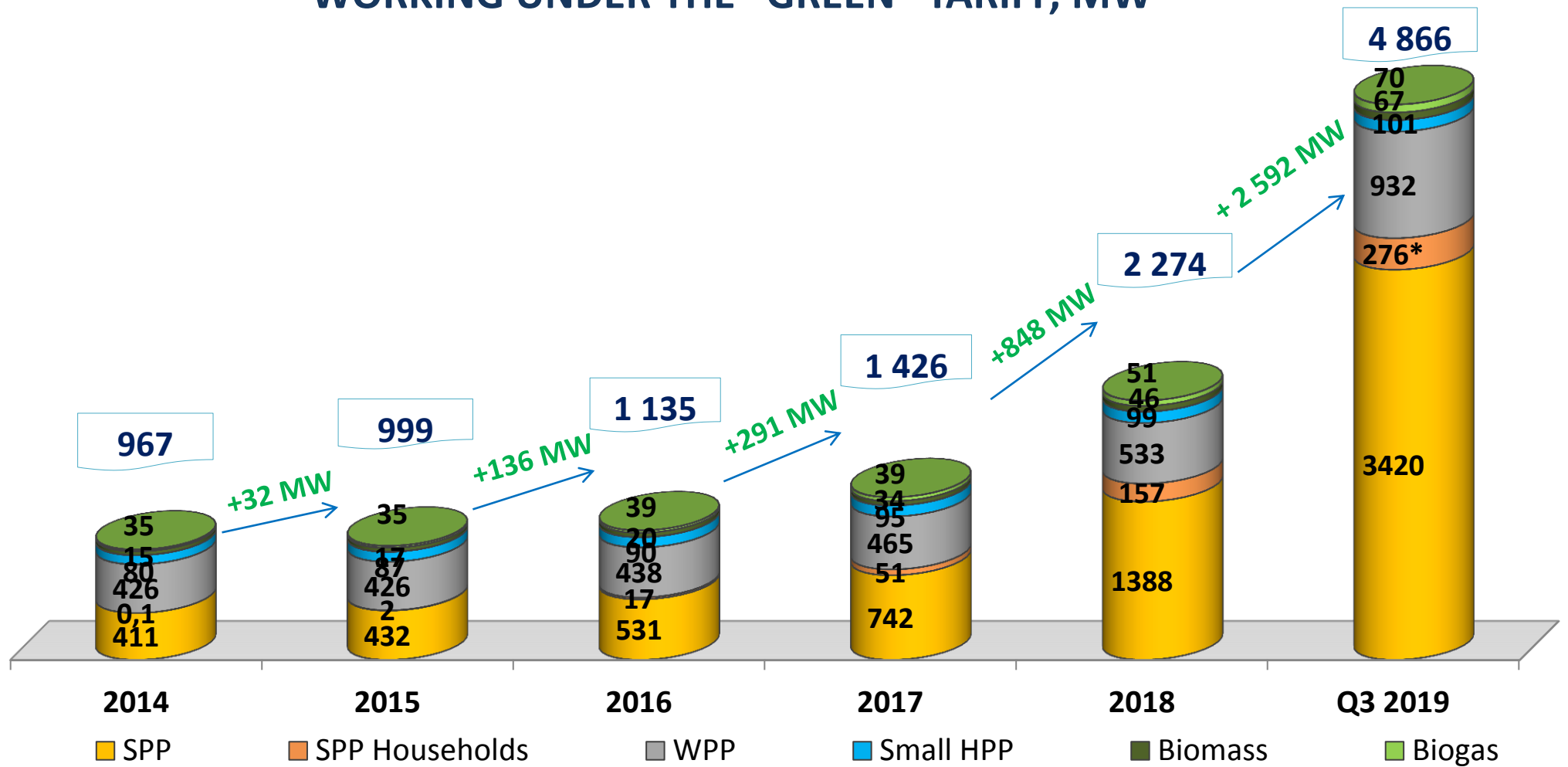
Public sector – development of EPC market

€ 8 bln – investment potential





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



From the beginning of 2015, 3 899 MW were introduced and around € 3.3 bln were invested.

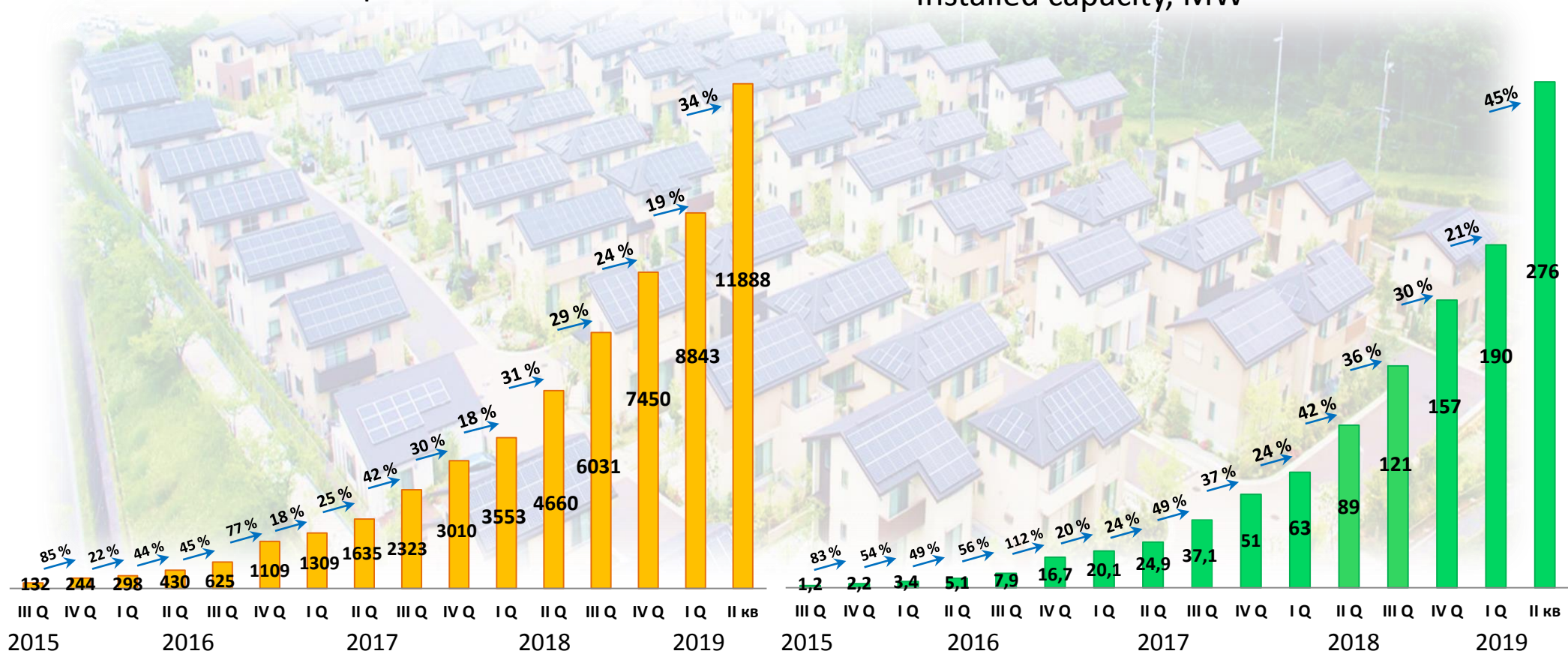




DYNAMICS OF SOLAR INSTALLATIONS IN PRIVATE HOUSES

Number of private households

Installed capacity, MW



Around **240 mln EURO** invested.

The number of private houses eligible for solar panels installation is **6,5 mln.**

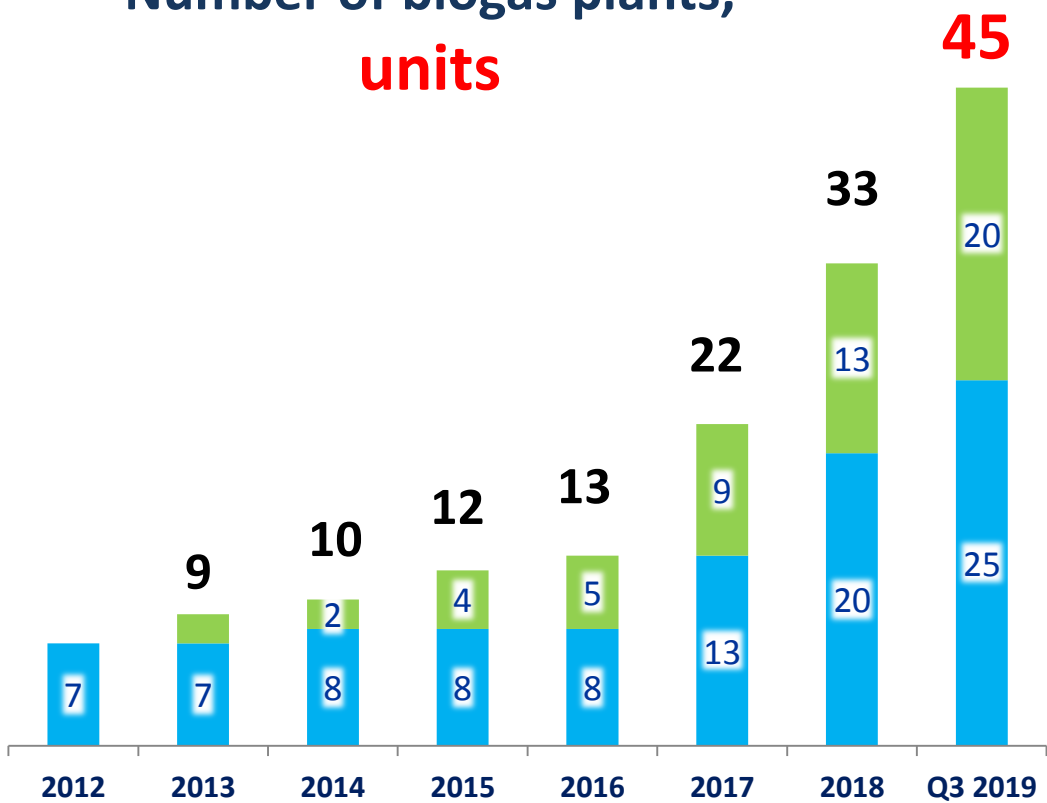




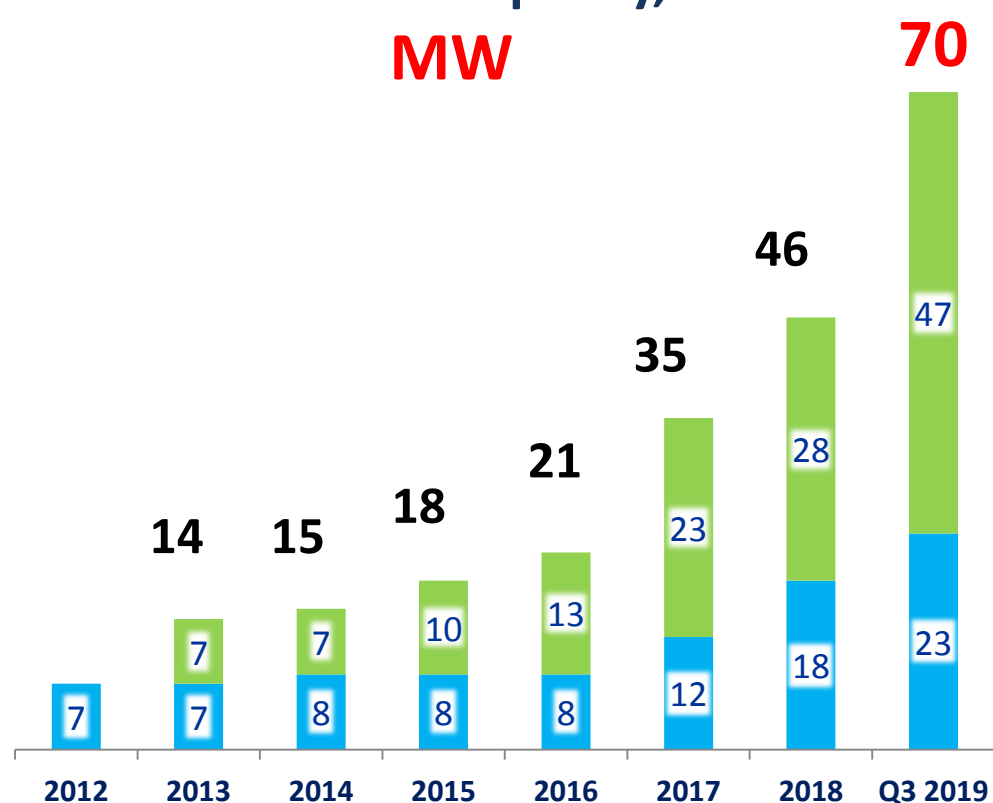
BIOGAS CAPACITY INCREASE IN UKRAINE

(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 ≥ 1 MW;



WPP ≥ 5 MW;

Other key points:

All types of RES will participate in auctions

Electronic Trading System

PROZORRO

Bank 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





«FEED-IN» TARIFF

€ct/kW*h

	2019	Law 2712-VIII			
		2020	2021	2022	2023
SPP (ground based)	15,02	11,26 (-25%)	10,88 (-2,5%)	10,50 (-2,5%)	10,12 (-2,5%)
WPP (> 2,0 MW)	10,18	9,05 (-10%)	-	-	-
SPP households	18,09	16,26 (-10%)	-	-	-
Hybrid (SPP+WPP) households	-	Introduction of "feed-in" tariff (12,28 €ct/kW*h)			
Biomass	12,39	The tariff is unchanged and stays at the fixed level of 2019 (12,39 €ct/kW*h)			





WEBINAR with IRENA

on the introduction of an auction system
to support renewable energy

Joint International Conference
«Auction Support Scheme in Ukraine for
Renewable Energy Deployment»



Date: October 31, 2018

Date: February 21, 2019

The result: the proposals made by IRENA experts with appropriate practical advice are sent to the Verkhovna Rada Committee on Fuel and Energy Complex for consideration during drafting the Law



On February 24, 2018, Ukraine became a member of the International Renewable Energy Agency (IRENA)





DRAFTING LAW ON SOLID BIOFUEL MARKET DEVELOPMENT

GOAL

CREATING LEGISLATIVE BASIS FOR SOLID BIOFUEL MARKET ESTABLISHMENT

MAIN PROVISIONS:

- creating a market mechanism for biofuels trading (electronic system for biofuels trading);
- assigning the obligation to trade through the electronic system for biofuels trading on designated entities;
- administrative responsibility for non-compliance of obligations on trade in biofuels set.

EXPECTED RESULTS FROM THE LAW ADOPTION:

Transparent biofuel market



Lower prices on biofuels



Creating new jobs



Growth of the solid biofuel volumes production



Fuels provision for generating facilities



Attracting investments for biofuel production





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)

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

From January 1, two years after adoption -

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

(Proposition : not less than 10 % volume (6,8% energy))

For Diesel

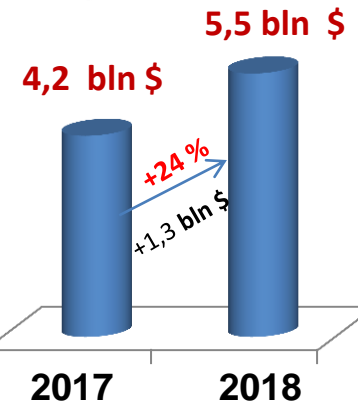
From January 1, next year after the adoption -

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

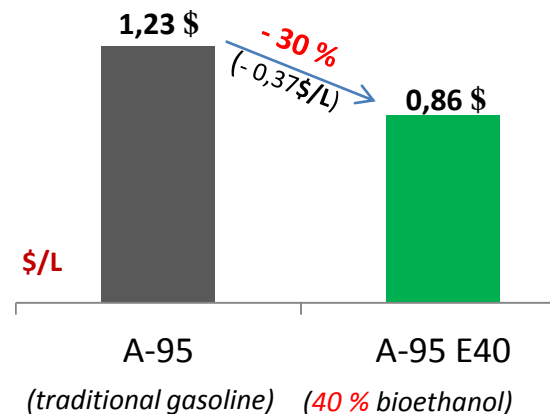
(Proposition : not less than 7 % volume (6,3% energy))

From next year after the adoption biocomponents must meet sustainability criteria

Import of crude oil and refined products*



Prices for traditional gasoline and with the addition of bioethanol in August 2019 **



* According to the State Fiscal Service of Ukraine

** 23 of September 1\$=24,43 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-Podilskyy**

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











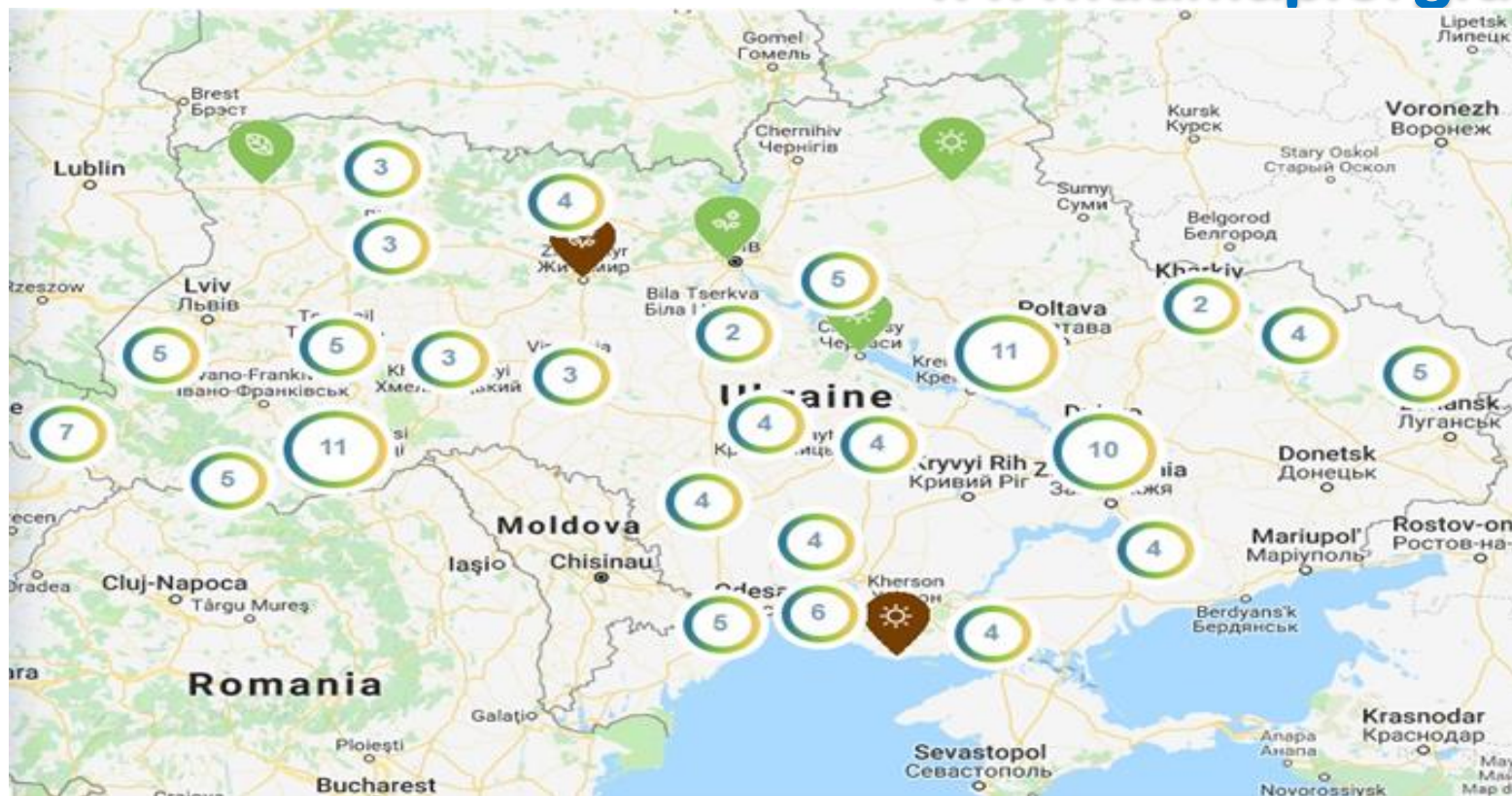
UAMAP comprises detailed information on

103 implemented and **112** potential projects that require investments & soft loans more than

€ 4,2bln

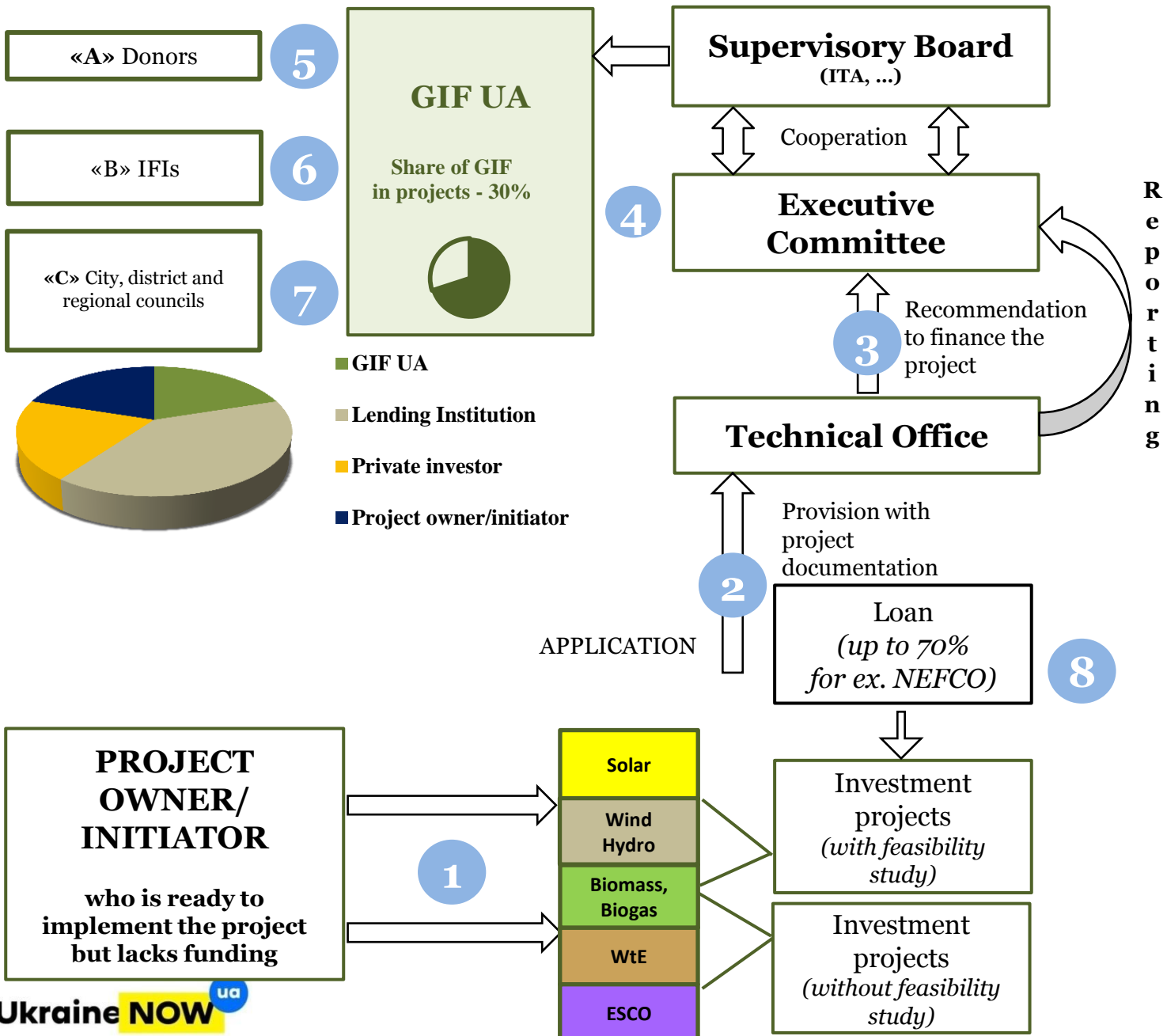
www.uamap.org.ua

-  Hydropower
-  Biomass
-  Biogas
-  Solar power
-  Wind power
-  Energy efficiency
-  Waste energy
-  Other





GIF UA: SCHEME OF OPERATION IN BRIEF



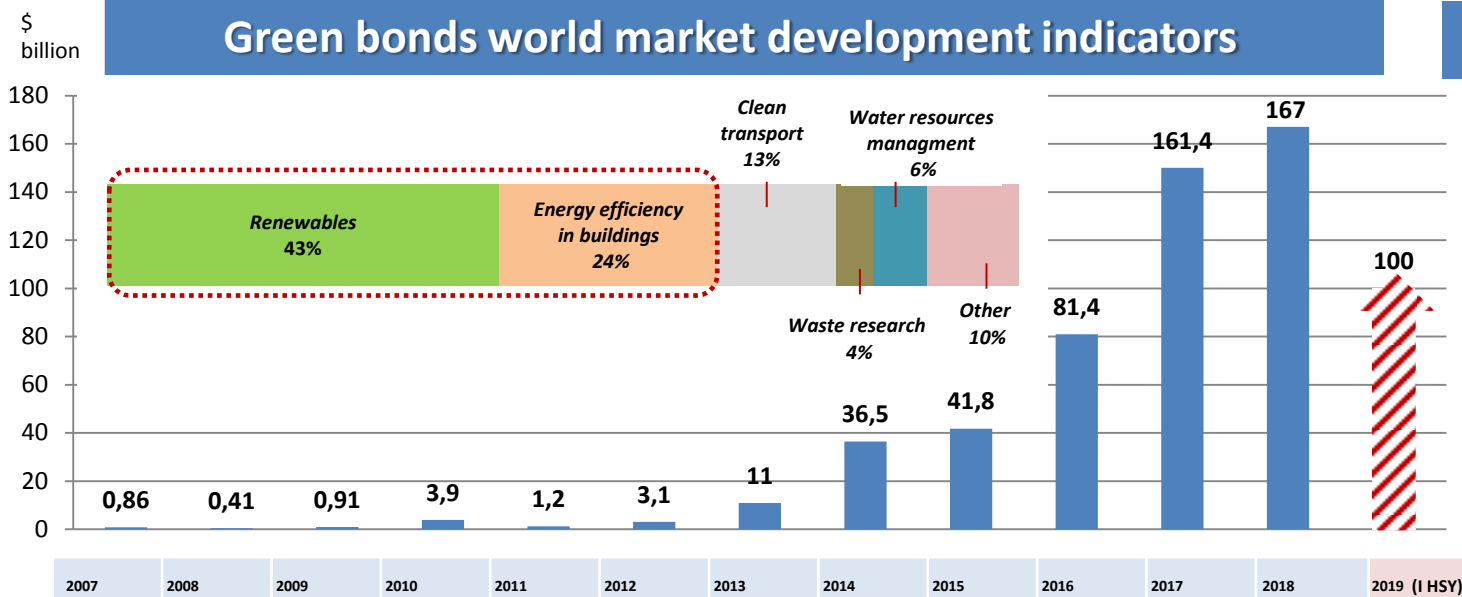
- 1 Customer appeals to GIF and selects interesting project(s) or offers his own.
- 2 Application Form is processed by Technical Office of GIF
- 3 Decision on the type of financing and interaction model with a project
- 4 GIF assesses and offers its equity share in RES project
- 5-6-7 Stakeholders invest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



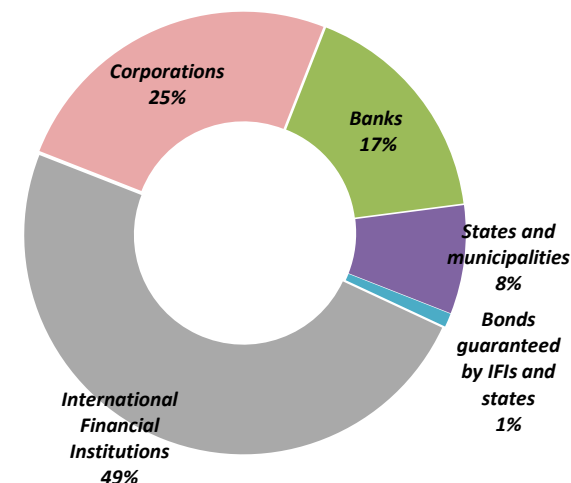


CREATION OF CONDITIONS FOR GREEN BOND MARKET INTRODUCTION IN UKRAINE

Green bonds world market development indicators



Key world issuers



Creation of conditions for implementation of green bonds market

Draft of Resolution of Cabinet Of Ministers Of Ukraine «To approve Concept of Green Bond Market Introduction in Ukraine and Affirm Action Plan of Its Implementation»



Establishing legal preconditions for green bond market introduction



Attracting investments to the green bond market



Contributing green bond market development

Next stages

Introduction of guidelines key procedures and incentives for the green bonds market (in accordance with international)

preparation and implementation of pilot projects for the issue of green bonds by different issuers

arranging information campaigns and attracting stakeholders on Ukrainian green bonds market



INVEST in UKRAINE!

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