

# **Strategy of development of the Coal mine methane (CMM) degasification and utilization as an alternative source of energy**

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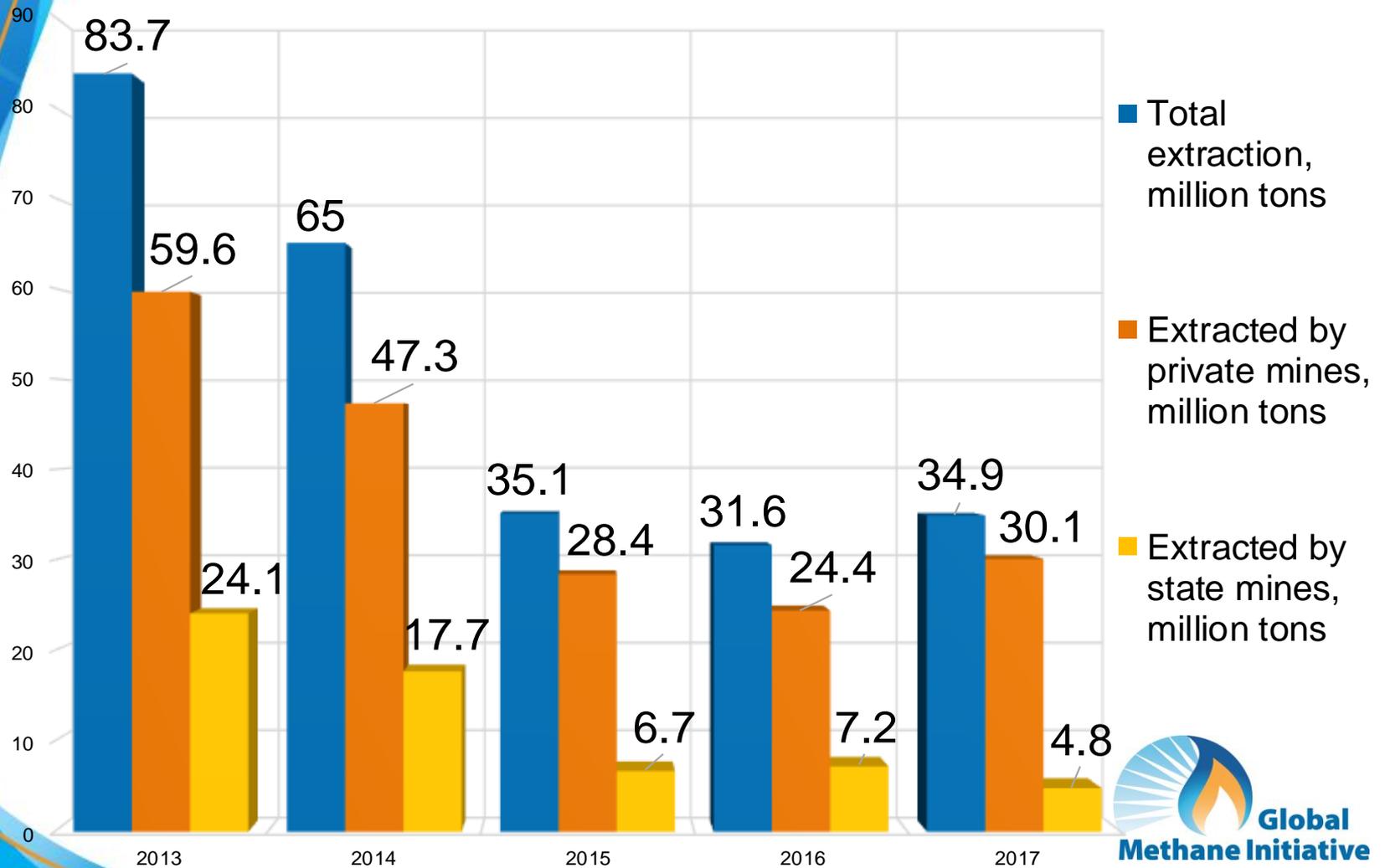
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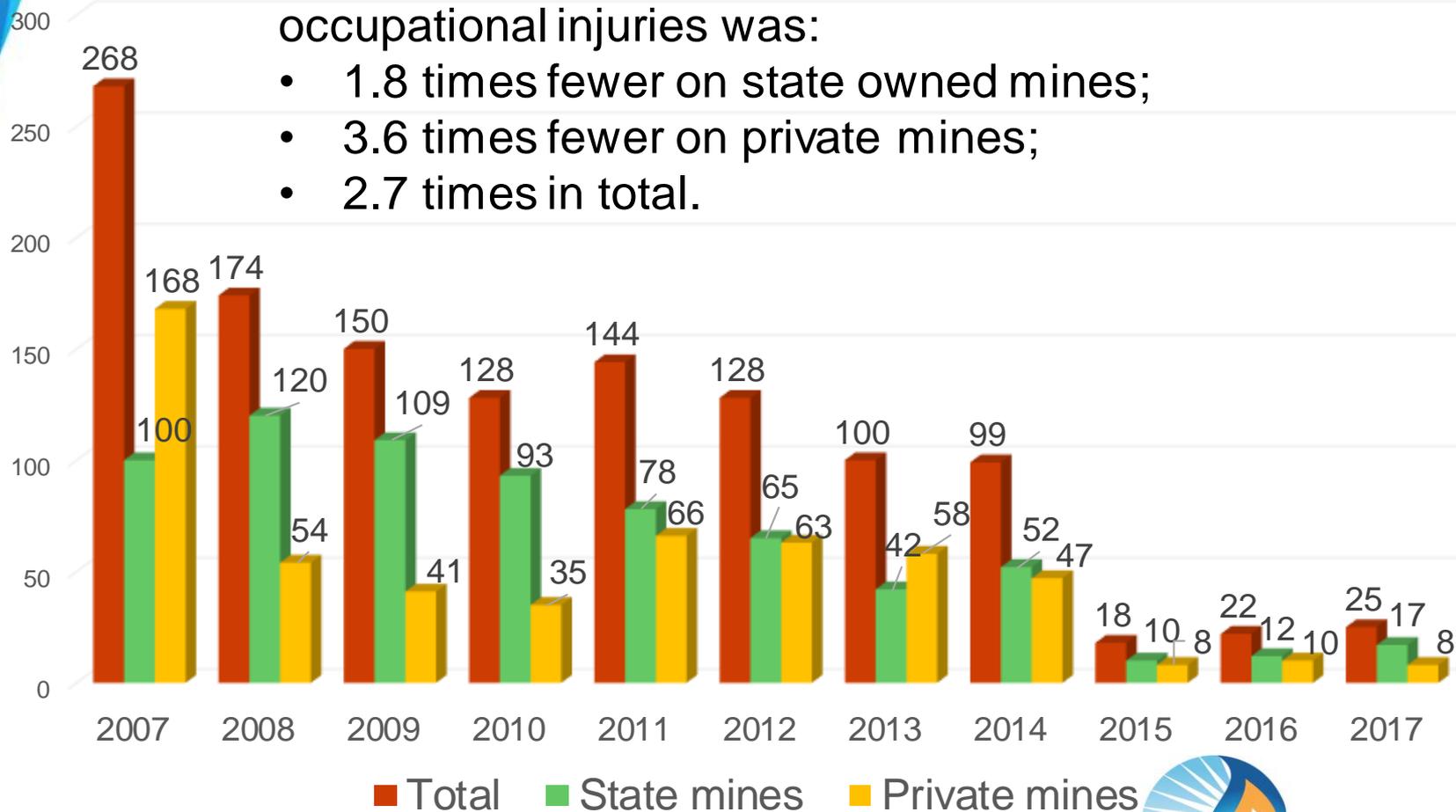
# Coal extraction in Ukraine



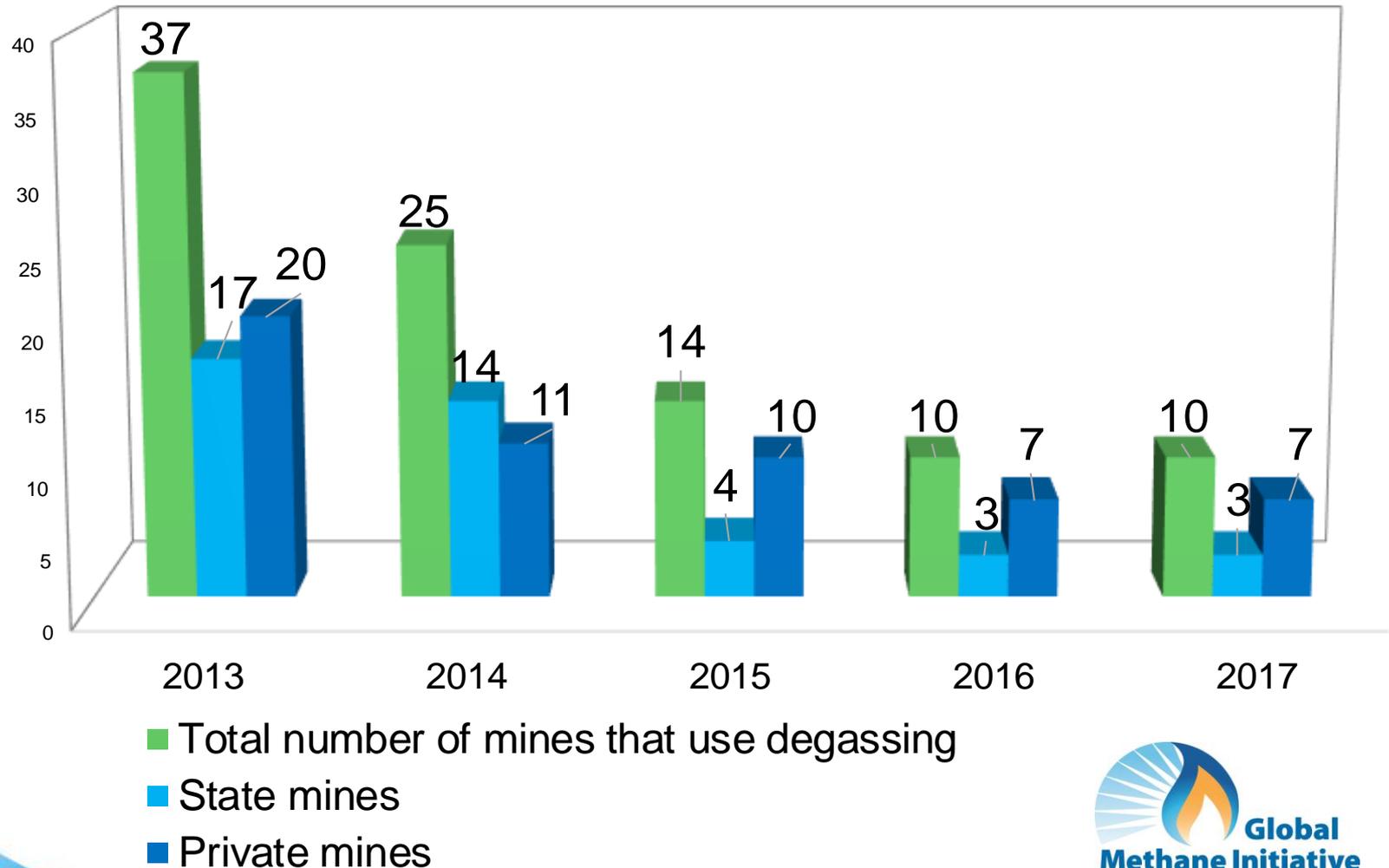
# Lethal occupational injury level dynamics

From 2007 to 2014 the number of lethal occupational injuries was:

- 1.8 times fewer on state owned mines;
- 3.6 times fewer on private mines;
- 2.7 times in total.

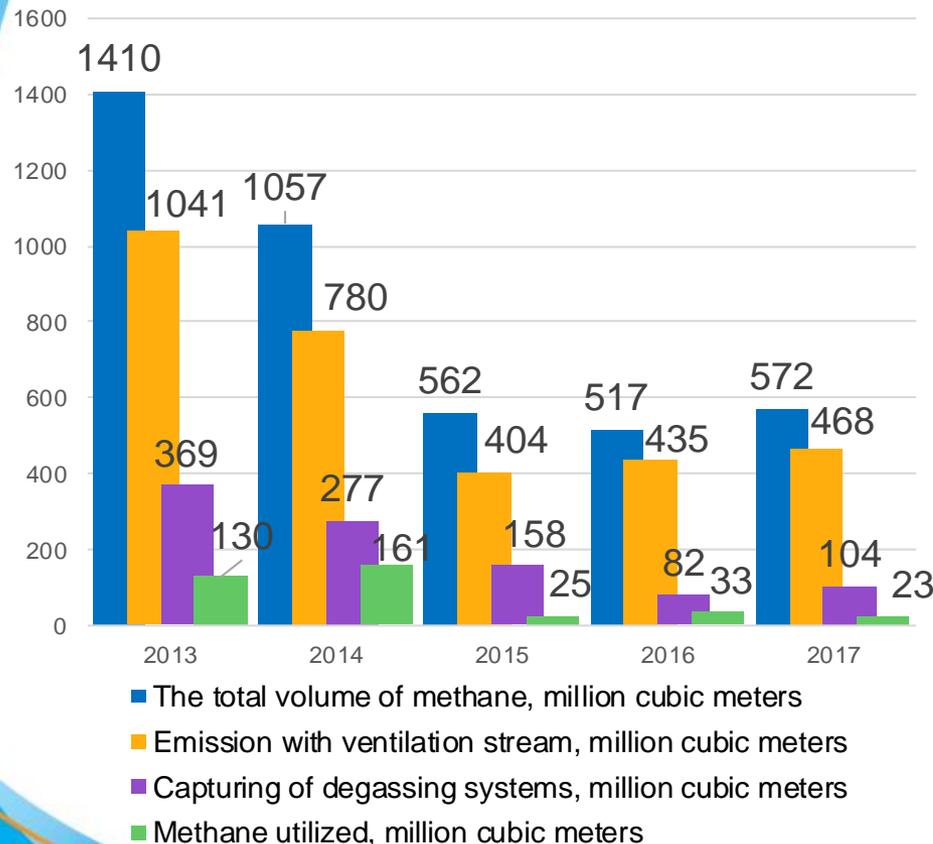


# Number of mines that used degassing for the period of 2013 - 2017



# CMM as an alternative source of energy

Efficiency of ventilation, degassing and utilization of CMM for 2013-2017



The total amount of CMM release in the mines of Ukraine in 2017 was 572 million cubic meters.

Including: methane emission with a ventilation stream - 468 million cubic meters and 104 million cubic meters was extracted by degassing.

Degassing volumes accounted for 18% of total methane emissions, total volume of CMM utilized - 23 million cubic meters.

# The most promising mines for the development and implementation of projects for CMM degasification and utilization

Name of the enterprise	CMM emission, million m <sup>3</sup> per year	CMM captured by degassing systems, million m <sup>3</sup> per year	CMM utilized, million m <sup>3</sup> per year
“Shakhta “Kapitalna” SOE “Mirnogradugol”	15.55	1.69	-
Shakhta “Uvileyna” PJSC “DTEK “Pavlogradvugillya”	57.5	23.0	-
Shakhta “Zahidno-Donbasska” PJSC “DTEK “Pavlogradvugillya”	59.64	11.89	-
Shakhta “Stepova” PJSC “DTEK “Pavlogradvugillya”	11.03	2.36	-
Total	143.72	38.94	-

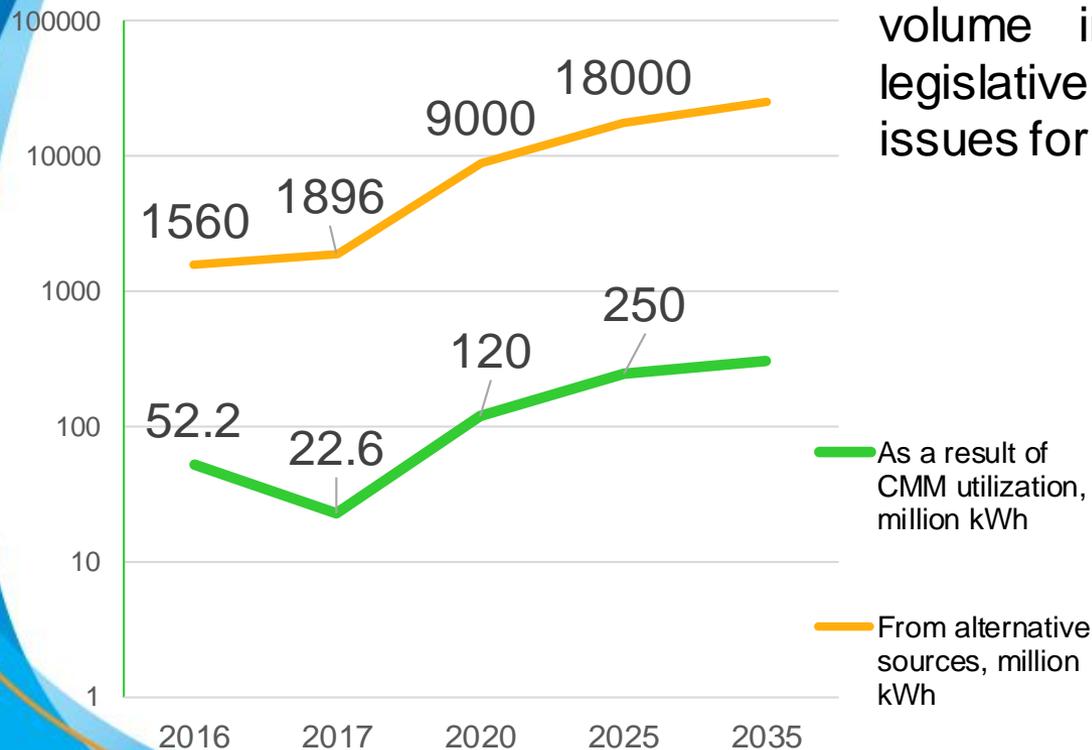
Listed enterprises are attractive for the implementation of projects for CMM degasification and utilization.

In the long term, there exists a real opportunity to increase the volume of degasification at these enterprises from 39 million m<sup>3</sup> per year to 60 million m<sup>3</sup> per year with subsequent disposal.

# Prospects for CMM cogeneration

The amount of electricity generated as a result of CMM utilization can have a positive dynamics and can sum up to approximately 1% of the amount of electricity generated from alternative sources on early stages.

## Annual electricity generation



The fall in the cogeneration volume in 2017 was due to the legislative non-regulation of taxation issues for the use of CMM.



## **Changes to legislation aimed at increasing of volumes of CMM degassing and stimulation of its utilization**

The Law of Ukraine "On Gas (Methane) of Coal Deposits" provides with a temporary exemption from taxation on profits of economic entities in the extraction and use of CMM.

In the end of 2017 amendments were made to the Tax Code of Ukraine:

The rate of environmental tax on CMM emissions to the atmosphere without utilization was increased by 11.2% to 3.5. US dollars per ton.

Coal mine methane of coal deposits is excluded from the objects of taxation. Thus, the tax rate on the use of CMM as a co-product in coal mining was eliminated. The rate, which existed before, amounted to 28% of the market value per cubic meter, which is equivalent to 74.5 US dollars per ton of methane gas extracted.

Before amendments to the Tax Law, the annual tax on CMM production of "Pokrovskoye" mine, whose degassing amounted to 19 thousand tons (24 million cubic meters) in 2017, was equal to 36.6 million UAH or 1.4 million US dollars.

# Main tasks and goals of the Centre for Alternative Sources of Energy

- Generalization, analysis and systematization of the accumulated experience on technology of degassing of coal seams of mines of Ukraine and its efficiency
- Generalization and analysis of world practices of CMM degassing and utilization technology
- Development of projects for CMM degasification and utilization
- Consulting services on the advanced technologies implementation for CMM degassing and utilization at mines of Ukraine
- Creation of catalogs and electronic database of geological characteristics of coal seams and of the best practices of CMM degassing and utilization
- Coal-mining enterprises' activities coordination in the field of CMM degassing and utilization
- Participation in the development of legislative and regulatory acts in the field of CMM degasification and utilization
- Exchange of best practices in the field of CMM degassing and utilization
- Coordination of scientific research in the field of technology improvement for CMM degassing and utilization

## Ninth International Forum on Energy for Sustainable Development

12 - 15 November 2018

Kyiv, Ukraine

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The Ninth International Forum on Energy for Sustainable Development will be held in Kyiv on 12-15 November 2018. The Forum is co-organized by the Government of Ukraine and the five United Nations Regional Commissions in partnership with the United Nations Development Programme (UNDP), United Nations Industrial Development Organization (UNIDO), United Nations Institute for Training and Research (UNITAR), UN Environment, The World Bank, International Energy Agency (IEA), International Renewable Energy Agency (IRENA), International Atomic Energy Agency (IAEA), Global Environment Facility (GEF), Organization for Security and Co-operation in Europe (OSCE), International Energy Charter, International Energy Forum (IEF), the Copenhagen Centre on Energy Efficiency, International Institute for Applied Systems Analysis (IIAS), Fraunhofer Institute for Environment Safety, and Energy Technology UMSICHT, Pacific Northwest National Laboratory (PNNL), Dartmouth College, and Climate Action Network (CAN).



**Thank you for your attention!**