

METHANE EMISSIONS REDUCTION IN UKRAINE: PRE- AND POST-WAR PRIORITIES

Oleksii Riabchyn

Advisor to the CEO of Naftogaz of Ukraine
on low-carbon businesses and EU Green Deal

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Naftogaz is Ukraine's national integrated company with 3 business platforms – Gas Business, B2C/Utility and Low Carbon Business.



Naftogaz in numbers

Naftogaz Group is a leading integrated oil and gas company, with more than **20** years of experience in oil and gas operations.

As a result of our business model, Naftogaz Group has established competitive advantages that are evident across all three of our business platforms – Gas Business, B2C/Utility, and Low Carbon Business.

51 947

EMPLOYEES

5.8 USD billion

TOTAL REVENUE

(2019, excl. gas transmission)

18.0 USD billion

TOTAL ASSETS

(2019, excl. gas transmission)

4.7 USD billion

TAX AND DIVIDEND PAYMENTS

Ukraine's largest taxpayer

14.2 bcm

GROSS GAS PRODUCTION

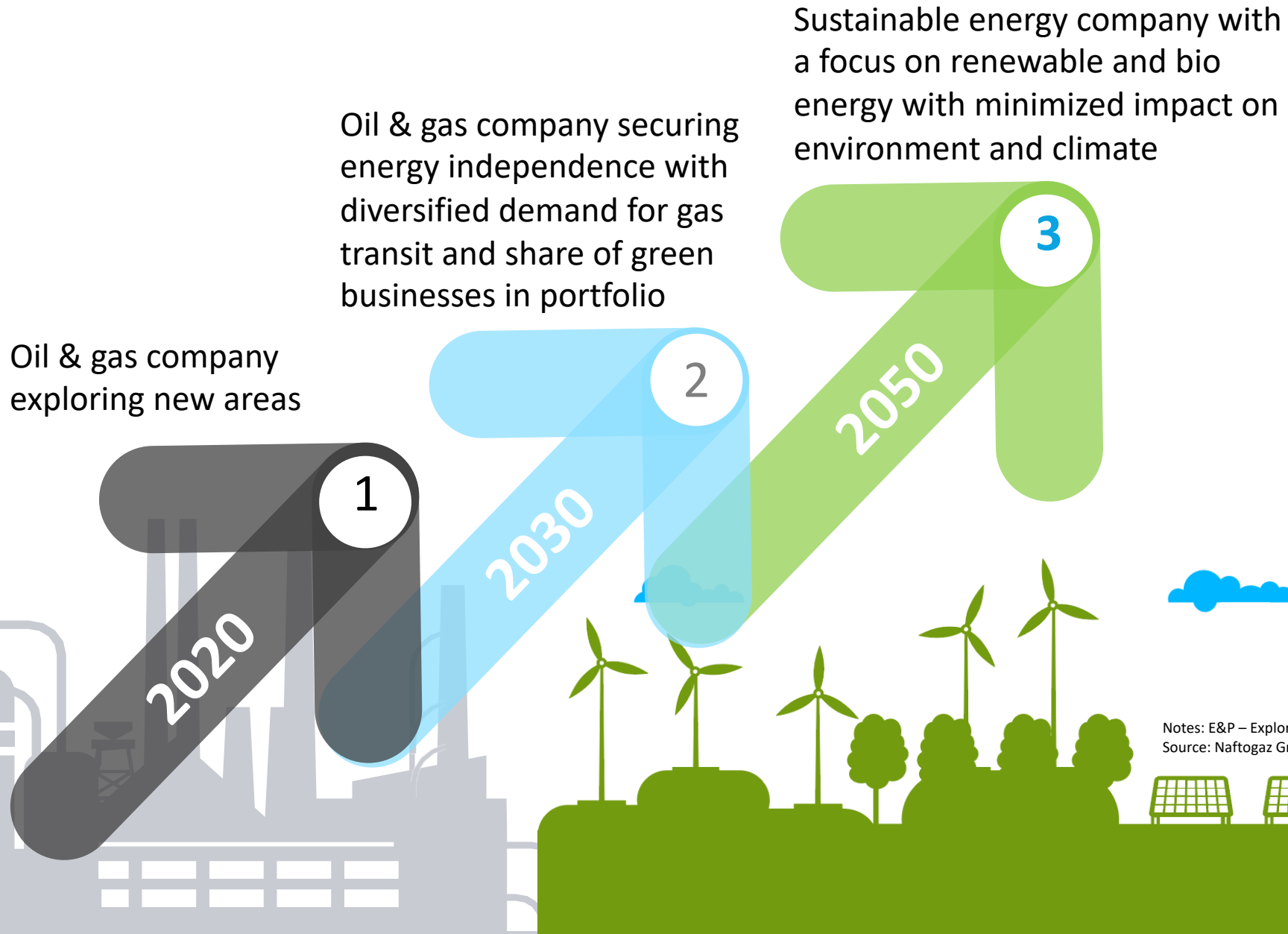
76% of total Ukrainian production

1.94 million tons

OIL AND GAS CONDENSATE

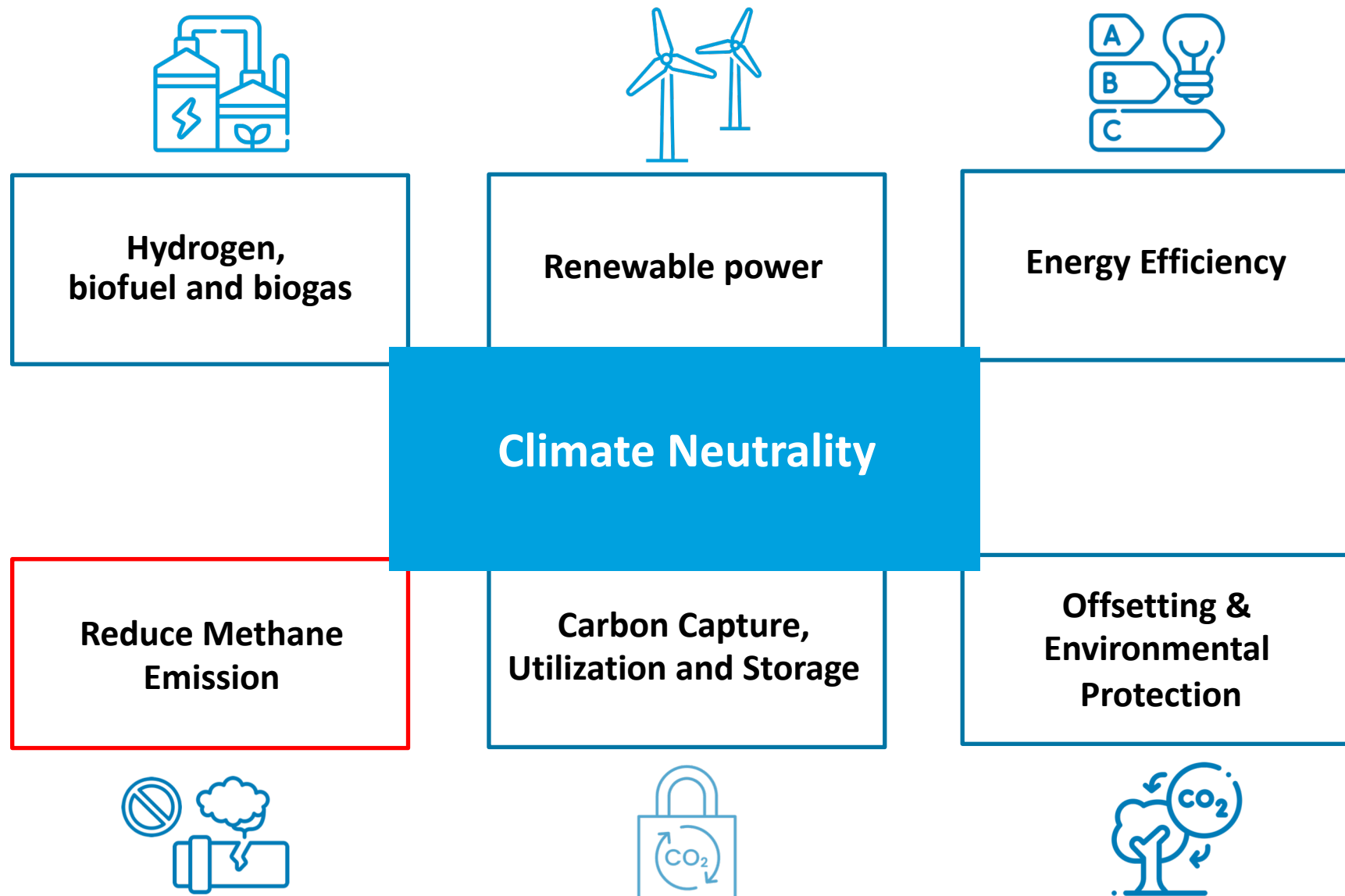
More than **80%** of Ukraine's total production

Naftogaz energy transition timeline



Notes: E&P – Exploration and Production
Source: Naftogaz Group

Naftogaz priorities of energy transition on its pathway for climate neutrality



Naftogaz supported joining Global Methane Pledge by Ukraine that sets a goal of 30% emissions reduction by 2030 at the country level:

“Naftogaz welcomes the joining Global Methane Pledge by Ukraine and notes that GHG reduction, including methane, is one of the Company’s priorities, which is stated in Naftogaz Corporate Strategy.”

Yuri Vitrenko, CEO of Naftogaz

In a letter to the Ministry of Environment of Ukraine on joining Global Methane Pledge



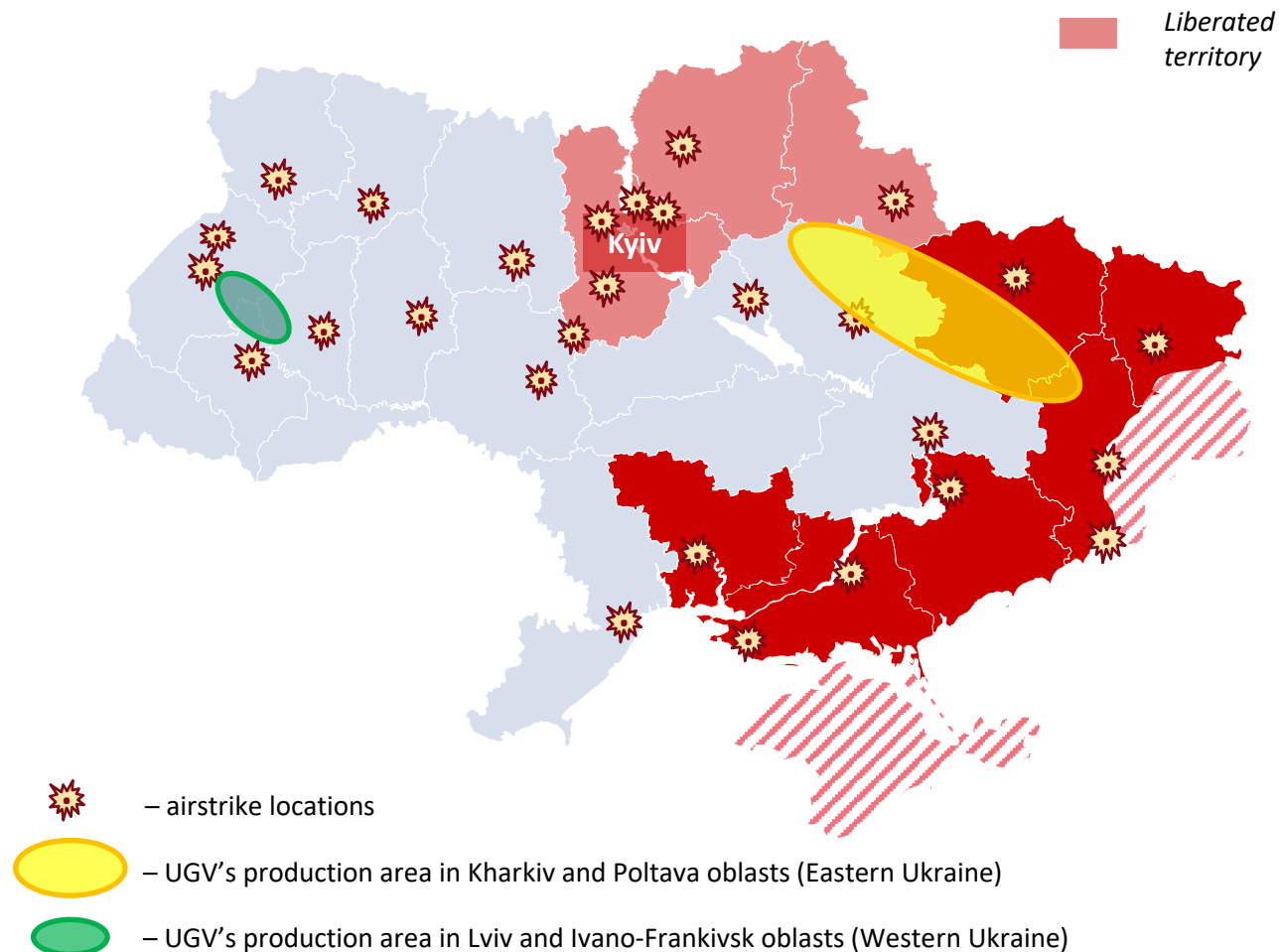
Impact of hostilities on the natural gas market

- Mass migration, decrease in number of subscribers
- Destroyed combined heat and power plants (CHPs) / heat generation stations (HGSs) and gas transmission infrastructure
- Reduced production, problems with gas sales, asset loss risks
- Suspended businesses, dwindling economy, impoverished population
- Increased arrears, degraded payment collection rate
- Increased maintenance cost for housing and utilities facilities (HUF) due to hostilities
- Growth in cost of basic energy resources
- Inability to raise H&U / DSO tariffs to provide for coverage of previous period expenses, wartime expenses, increased arrears and dwindling subscriber base
- Consumers' inability to pay market prices and wartime extra costs

94% of daily UGV production is exposed to high risk, the production may halt if aggression on the Eastern flank continues

32.1 mmcm of UGV's current daily production is in the Eastern Ukraine bordering on the combat zone.

Out of them, **18** mmcm are very close to the hostilities in Kharkiv oblast.



Half of the consumers will have problems paying their bills,
a third will be unable to pay...

< 4,4 mn

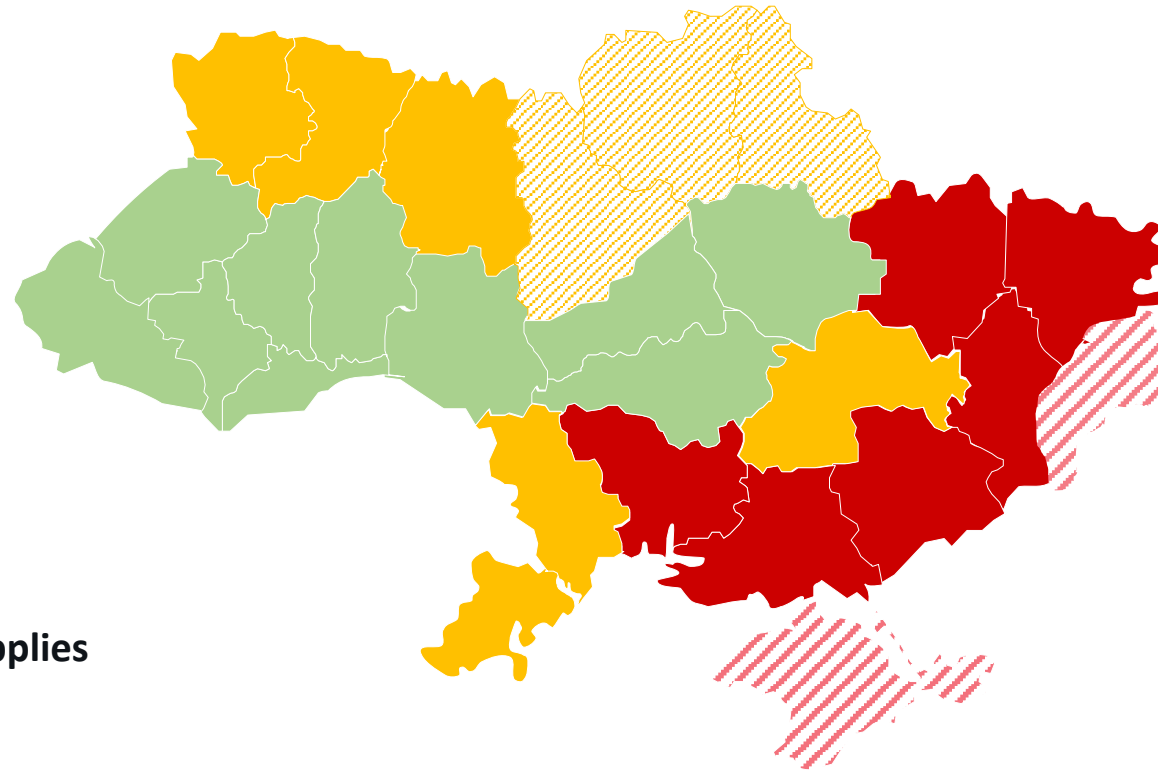
Ukrainians were forced to leave for
Europe (10% of the population)

70% of oblasts (regions)
suffered from the hostilities

34% subscribers are at risk of
inability to pay for their utilities

< 11,4 mn

forced **internally**
displaced persons



1.6 times

is the increased arrears for the
natural gas supplied,
up to UAH 7 bn as at 1 April 2022.

< 300 k

subscribers left
with no natural gas supplies

Active hostilities
zone

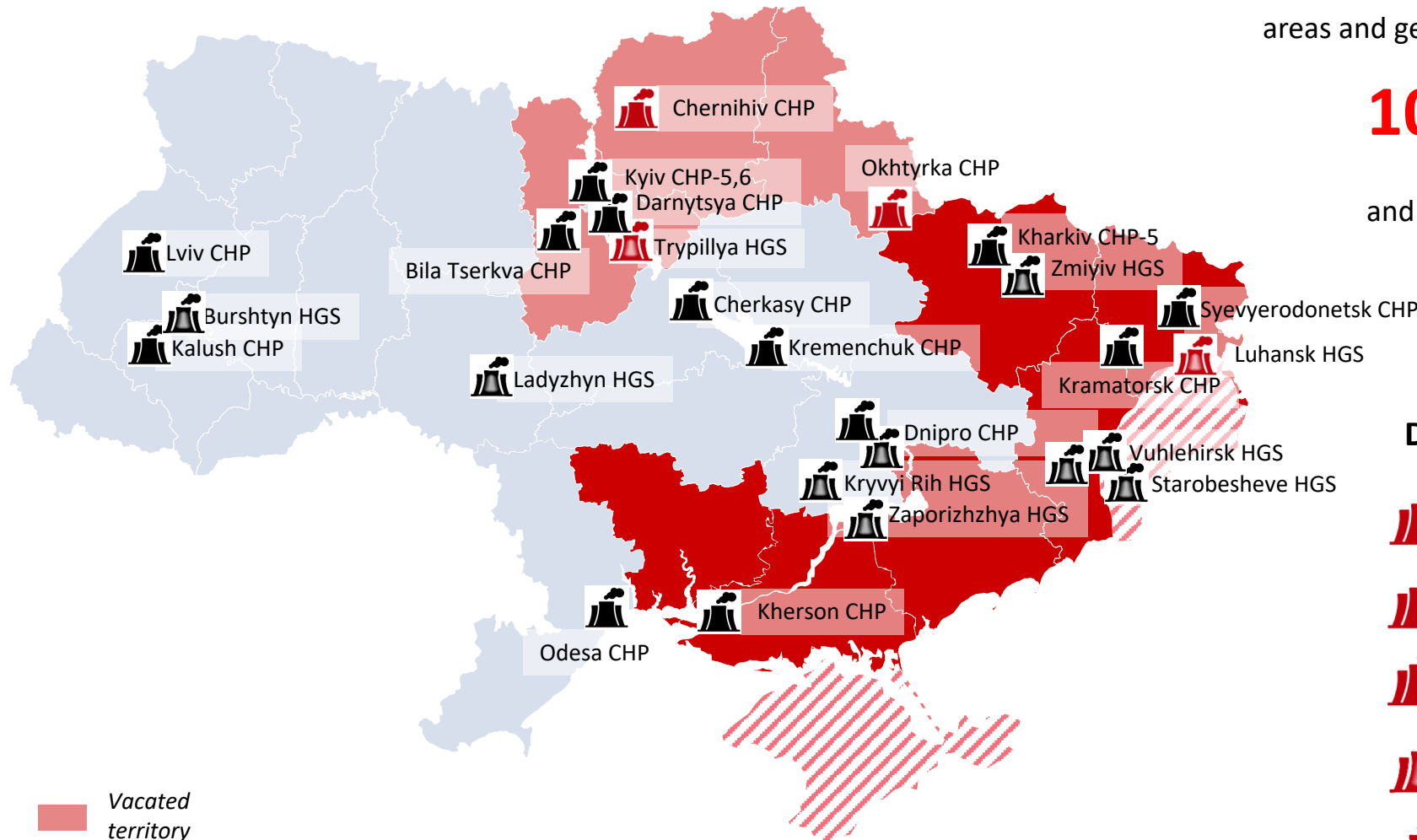
High threat
zone

Medium threat
zone

Vacated
territory

Targeted shelling by the russian occupiers damaged at least 4 CHPs and HGS, one occupied

Largest CHPs and HGSs of Ukraine that generate 90% capacity



19 of 36 CHPs in Ukraine are in active combat

areas and generate **43%** of the total capacity

10 of 15 HGSs are in active combat areas

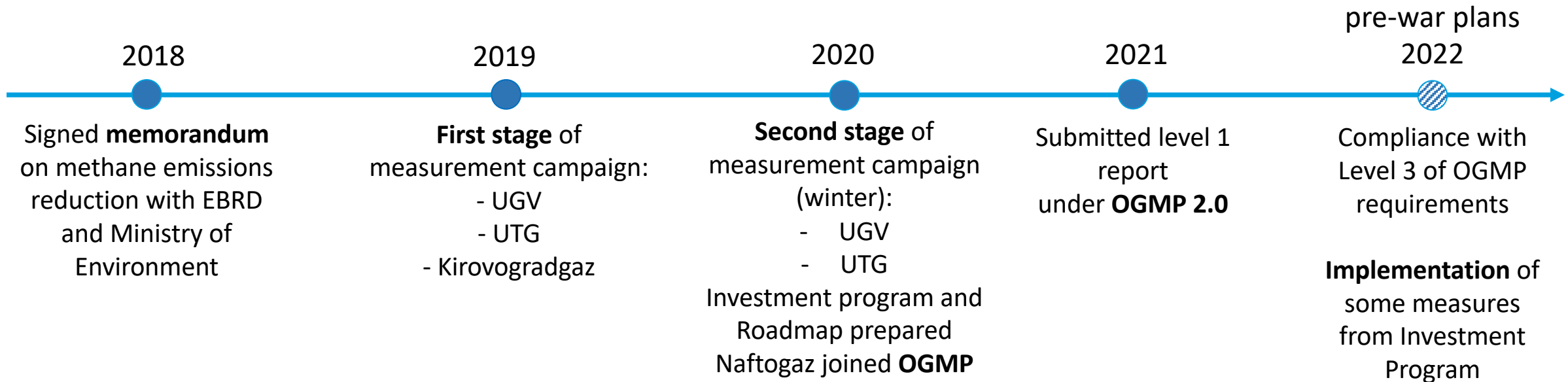
and generate **65%** of the total capacity

Damaged and lost CHPs and HGSs

- Okhtyrka CHP – almost totally destroyed
- Chernihiv CHP – hit by shells
- Kremenchuk CHP – hit by shells
- Trypillya HGS – shelled
- Luhansk HGS – under occupation

Timeline of Naftogaz methane emissions reduction before the war

It was planned to submit level 3 report in 2022. However, because some objects got damaged or are on occupied territories, data on them are limited. **Naftogaz will submit level 1 report in 2022**, and continue to gather data and **prepare level 3**.



Partners



CARBON LIMITS

Methane emissions reductions at UGV

Business-as-usual

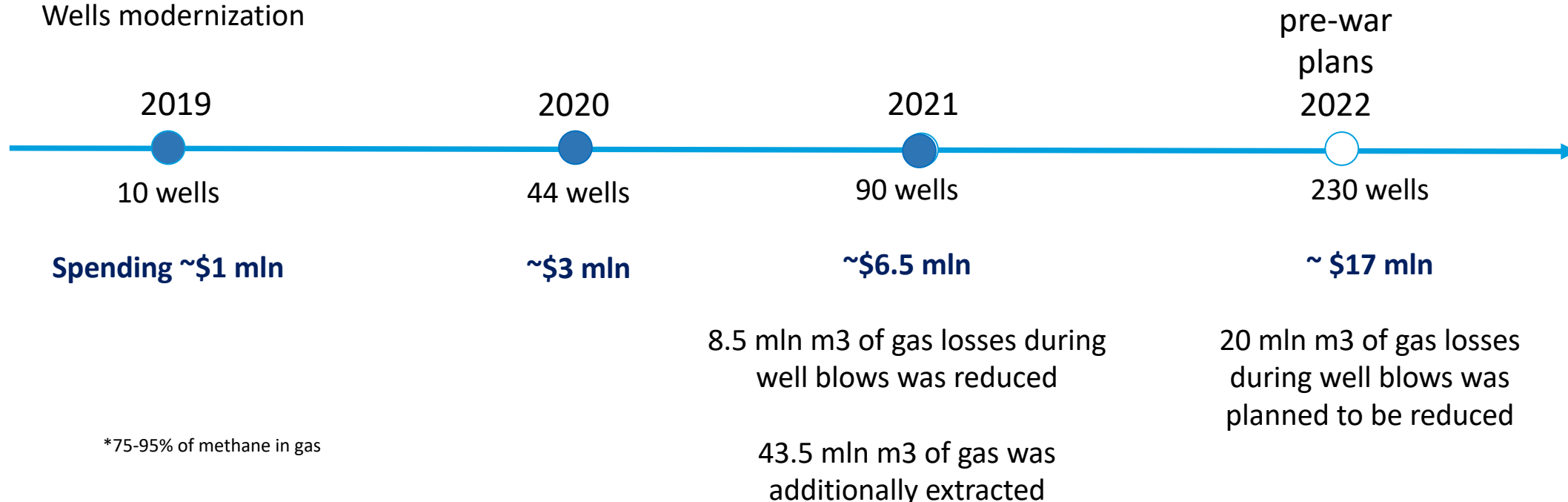
As gas deposits get depleted and liquid starts to accumulate, unloading well to atmosphere is needed. This is usually done with gas* that is then burned



Alternative

There are around 15 technologies of artificial extraction that do not require gas to remove liquid. UGV launched the process of wells modernization, using the technologies of plunger-lift and capillary systems.

Wells modernization



*75-95% of methane in gas

Comparison of emission categories between OGMP and Naftogaz

Source	OGMP	UGV (Production)	UGV (Processing)	UTG	Ukrburgaz
Equipment:					
Pneumatici	✓	✓	?	✓	
Glycol absorbers	✓	-	-	✓	
USB condensate storage tanks	✓	✓	○	-	
Other venting:					
Flares' blowout	✓	✓	-	✓	
Compressors (mt)	✓	✓	✓	✓	
Compressors (ops)	✓	○	○	✓/?	
Equipment blowout	✓	✓	○	✓	
Equipment venting	✓	○	○	?	
Purging	✓	✓	✓	-	
Wells:					
Drilling	○	-	-	-	○
Hydrofracturing	✓	✓	-	-	-
Casinghead gas	✓	-	-	-	-
Well testing	○	-	-	-	✓
Well survey	○	✓	-	✓	-
Well purging	✓	✓	-	✓	-

Legend:

- ✓ Activity, methodology, and data exist
- Activity exists but the methodology is under development
- ? Requires clarification
- No activity

War circumstances

Lack of data, since some objects got ruined, damaged or are on occupied territories
Some employees responsible for data gathering serve in the army

Discrepancies with practice

Some categories are overestimated
Some categories are underestimated

Differences in reporting between legal entities

Sometimes there is no unified database

Completeness

There are some OGMP categories that are currently not covered

Difficulty

Some of the not estimated categories are difficult to quantify to a good level of accuracy

Materiality

Bringing Level 3 reporting to Level 4 reporting will require materiality analysis across emission

- For Ukraine, war has changed priorities from development to security with high level of uncertainties;
- Methane emissions are not the biggest polluter to tackle. We have new sources – military equipment, ruined infrastructure, such as oil bases and gas transmission systems;
- Before war, environmental and climate push from EU was a motivation to reduce CH₄ emissions, now it is resource-efficiency and energy security;
- European integration will be a focus as well, Ukraine will get these requirements in the new portion of regulation to align with;
- Ukraine will face financing problems to attract investment to increase the production of gas and reduce CH₄ emissions due to the emerging green taxonomies of IFIs. Ukraine needs a waiver from them for investments in gas infrastructure;
- In the case of restrictions/embargo of russian fossils will be investments in new production facilities and infrastructure that emit less CH₄ than russian ones

Thank you!



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