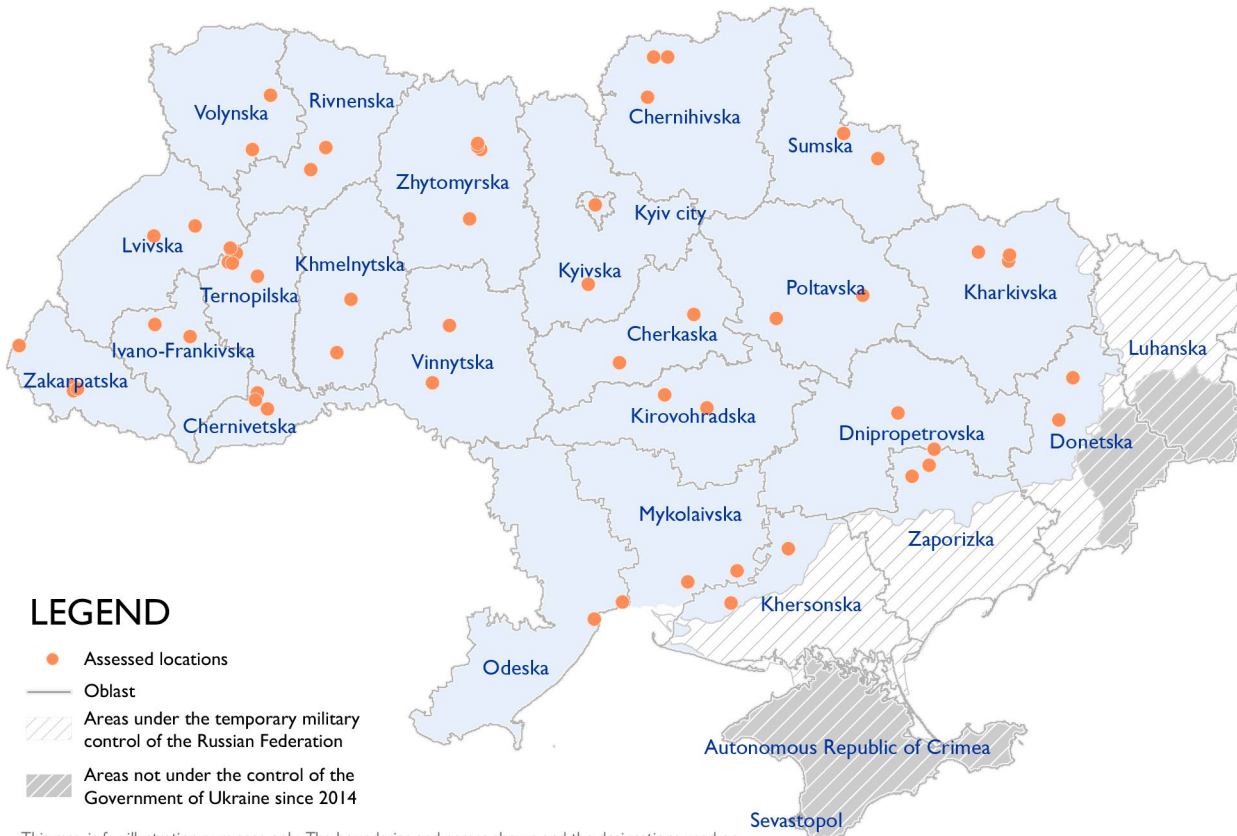


SOLID FUEL ASSESSMENT UKRAINE | AUGUST 2023

Locations assessed in August 2023



This map is for illustration purposes only. The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the International Organization for Migration.

OVERVIEW

The following report serves to identify heating systems in use across Ukrainian households and the estimated price of solid fuel items across oblasts in support of ongoing humanitarian winterization operations. The report investigates the demand for, supply of, and price of essential solid fuel products both at the time of the assessment and in the coming month.

Between 15 and 22 August, the Data and Analytics (D&A) team surveyed 182 markets in 23 Oblasts in Ukraine, to conduct face-to-face and remote interviews with both local vendors and community focal points (CFPs). For the purpose of this assessment, markets are defined as shops or vendors which supply solid fuel items. In each oblast, data was collected in at least two locations, one urban and one rural and/or near frontline locations, where applicable. In each location, a minimum of two vendors and two CFPs (non-vendors) were surveyed. The CFPs were chosen based on their familiarity with the subject matter and knowledge of winterization preparation at the community level.

IOM is committed to providing humanitarian and recovery partners in Ukraine with timely, relevant, and high-quality data. Please contact us if you have further questions on the methodology or key findings at DTMUkraine@iom.int.

DISCLAIMER

The opinions expressed in this report are those of the authors and do not necessarily reflect the views of the International Organization for Migration (IOM). The information contained in this report is for general information purposes only. The designations employed and the presentation of material throughout the report do not imply expression of any opinion whatsoever on the part of IOM concerning the legal status of any country, territory, city or area, or of its authorities, or concerning its frontiers or boundaries. All maps in this report are for illustration purposes only. The boundaries and names shown, and the designations used on all maps in this report do not imply official endorsement or acceptance by the International Organization for Migration.

KEY FINDINGS



- Vendors anticipate increases in the supply, demand, and price of solid fuels in the coming months. These expectations are particularly evident in locations closer to the frontlines.



- Following Shelter and NFI Cluster guidelines on recommended solid fuel quantities for seasonal household (HH) needs, many vendors perceived firewood (8m³), briquettes (4.5 mt) and pellets (6mt) amounts to be insufficient to meet HH needs over the winter season ([Ukraine Winterisation Recommendations 2023-2024](#)).



- KIs indicated that in Chernihivska, Dnipropetrovska, Kharkivska, Khersonska, Kyivska Oblasts, and Kyiv city, less than half the population has access to solid fuel heating appliances. This leaves them vulnerable in the face of deteriorating security or infrastructure damage. This situation is mirrored in non-frontline areas like Cherkaska, Poltaska, and Rivnenska Oblasts.



- High demand for the distribution of solid fuels was reported in Chernihivska, Donetsk, Kharkivska, Sumska, Zaporizka Oblasts, and Kyiv city. Notably, in oblasts with medium to high-level residential destruction, a high demand for residential insulation was reported by KIs.

- After last year's power shortages, many KIs expressed concerns about potential electricity shortages and the impact on reliable heating access for the upcoming winter. Stable electricity supply is consistently reported as a top winterization need throughout the country, as it directly affects the operation of solid fuel appliances.

- In most oblasts, residents generally have access to both electric and gas heating. However, in certain oblasts, residents may have access to only one or none of these heating modes, with accessibility typically linked to relative stability in terms of safety. For instance, vendors in Sumska Oblast reported that frequent shelling can compromise the accessibility and functionality of central electricity and gas supply.

- In the frontline oblasts of Donetsk and Kyivska along with Chernivetska, Ternopilska and Volynska Oblast, KIs reported few residents have access to gas heating systems. Similarly, in Chernivetska, Odeska and Zhytomyrska Oblasts, few residents have access to electric heating

PRICE OVERVIEW

Fuel	Median price per unit (not including transportation)
Firewood	1,543 UAH/stacked m ³
Coal	9,182 UAH/ton
Briquettes	9 UAH/kg
Pellets	9 UAH/kg

DEFINITIONS

- The assessment utilised Shelter and NFI Cluster indicators to evaluate the adequacy of recommended solid fuel quantities for seasonal HH needs. These indicators include specific quantities, such as 8 cubic meters (m³) of firewood, 4 metric tons (mt) of coal, 4.5 mt of briquettes, and 6 mt of pellets.
- Urban and rural areas are distinguished based on population estimates, with rural areas having <20,000 residents. The categorization of frontline and non-frontline locations applies solely to oblasts near the frontline (i.e., Chernihivska, Donetsk, Dnipropetrovska, Kharkivska, Khersonska, Mykolaivska, and Sumska Oblasts). Frontline locations encompass areas previously occupied or currently experiencing regular direct attacks due to their geographic proximity. These four classifications are not mutually exclusive, meaning that rural and urban areas can include both frontline and non-frontline locations.
- Reference to key informants (KIs) includes responses provided by both local vendors and community focal points (CFPs), including public officials, community leaders, teachers, healthcare workers, members of civil society, and so on.
- Median pricing estimates are utilised across the report. Median rates control for outlier (extremely high or low) prices to provide humanitarian partners with more accurate cost estimates.

VENDOR EXPECTATIONS

Vendors in assessed urban locations were notably more likely than those in rural locations to anticipate an increase in the demand for, supply of, and price of solid fuels in the coming month. Vendors operating in frontline locations were, however, the most likely to expect an increase in all three factors.

“Solid fuel vendors are not present [in rural frontline areas] due to security concerns.” (CFPs in Donetsk and Khersonska Oblasts)

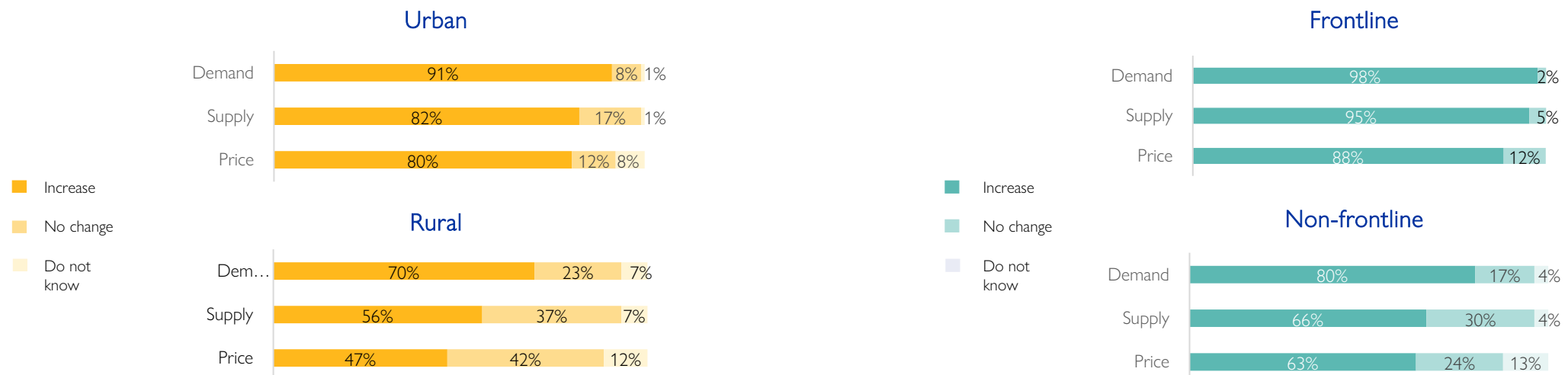
At the time of the data collection, none of the vendors surveyed expected a decrease in the supply of, demand for, or price of solid fuels. Additionally, no vendors reported noticeable changes in solid fuel supply, demand, or prices from the month prior to the data collection.

“...residents are gradually switching from gas heating to solid fuel heating.” (vendors in Khersonska Oblast).

In most oblasts, both vendors and CFPs emphasized firewood as the primary source of solid fuel for residents. This preference is attributed to the abundant forests across the country and cost-saving considerations, as alternatives like pellets and briquettes are generally considered more expensive. Many communities in Ukraine actively engage in self-harvesting of wood, collaborating with environmental services to secure tree felling permits and gather fallen trees. As conflict persists and economic resilience declines, communities' resilience to ongoing shocks will also decline.

“The payment capacity of the population is low, and it is expected that not everyone will be able to purchase solid fuel.” (vendor in Kirovohradska Oblast)

Expectations of solid fuel demand, supply and price over the next month, by type of location (% of vendors)



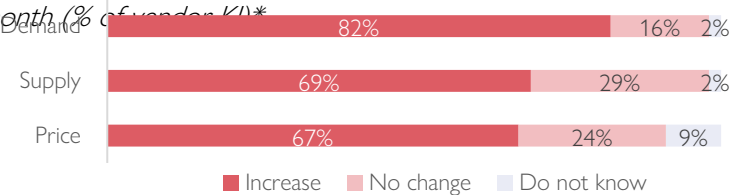
FIREWOOD

Median price of firewood according to interviewed vendors

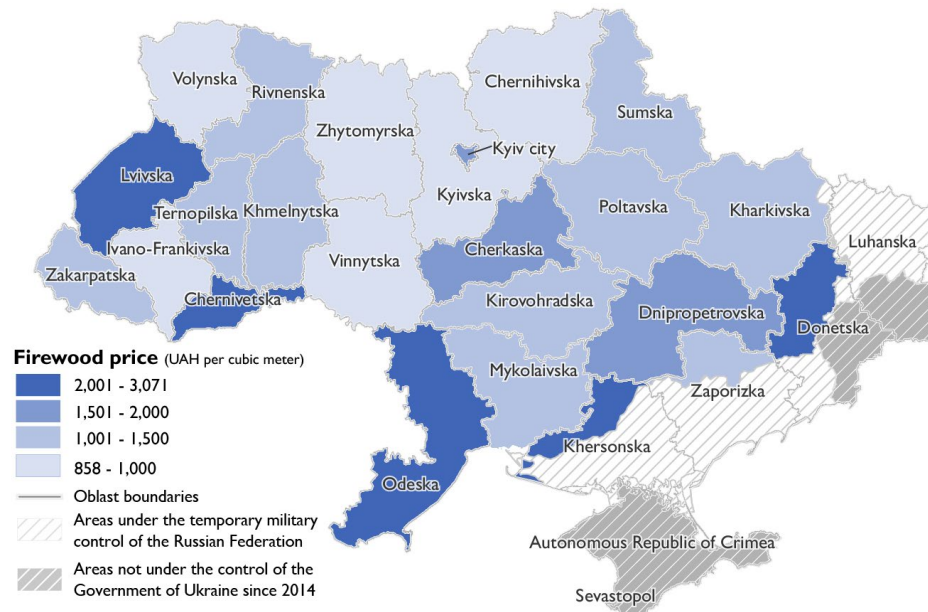
Median price per unit	1,543 UAH per stacked m ³
Median price per unit by vendor location	
Urban	1,675 UAH per stacked m ³
Rural	1,200 UAH per stacked m ³
Frontline	1,500 UAH per stacked m ³
Non-frontline	1,300 UAH per stacked m ³
Median price per unit by vendor type	
Direct manufacture market	1,032 UAH per stacked m ³
Individual distributor	1,550 UAH per stacked m ³
Large trading network	1,625 UAH per stacked m ³
Local shop	1,266 UAH per stacked m ³
Wholesale point	1,675 UAH per stacked m ³
Other	857 UAH per stacked m ³
Median price per unit by quality	
Low	1,100 UAH per stacked m ³
High	1,500 UAH per stacked m ³

PERCEPTIONS FOR THE COMING MONTH

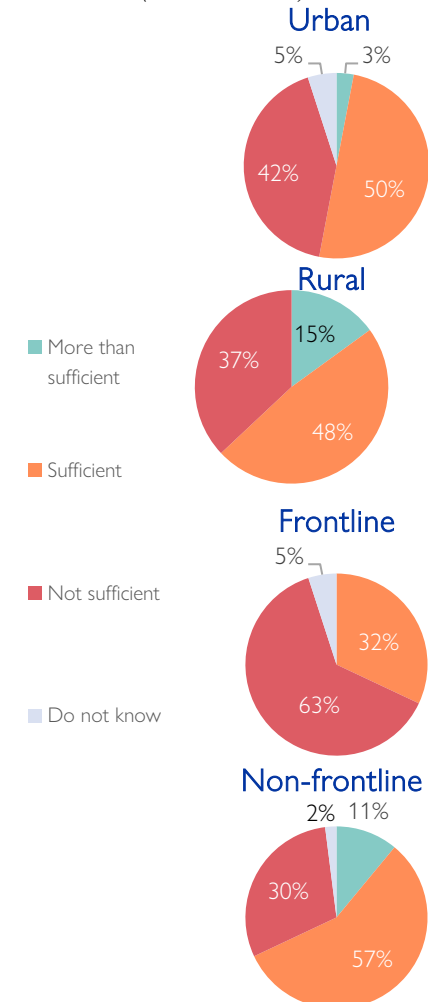
Perception of how demand, supply and price are expected in the coming month (% of vendors KD)*



Median price for firewood by oblast (UAH)



Perception on the recommended seasonal quantity of firewood (8m³) per HH (% of vendors)*



Hardwood (high quality): derives from trees that are slower growing and has a high thermal conductivity. It is therefore a slow burning and efficient solid fuel source.

Softwood (low quality): typically derives from conifer or 'evergreen' trees and has a comparative low thermal conductivity. It therefore burns faster than hardwood and produces more smoke and ash.

*According to the Shelter and NFI Cluster guidelines

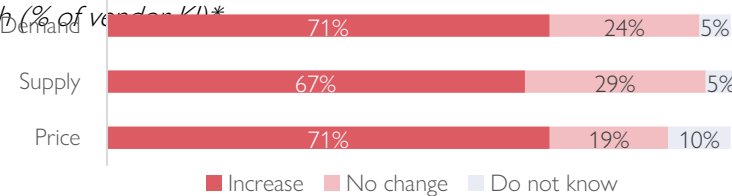
BRIQUETTES

Median price of briquettes according to interviewed vendors

Median price per unit	9 UAH per kg
Median price per unit by vendor location	
Urban	8 UAH per kg
Rural	7 UAH per kg
Frontline	7 UAH per kg
Non-frontline	8 UAH per kg
Median price per unit by vendor type	
Direct manufacture market	7 UAH per kg
Individual distributor	7 UAH per kg
Large trading network	18 UAH per kg
Wholesale point	8 UAH per kg
Other	9 UAH per kg
Median price per unit by quality	
Low	7 UAH per kg
High	8 UAH per kg

PERCEPTIONS FOR THE COMING MONTH

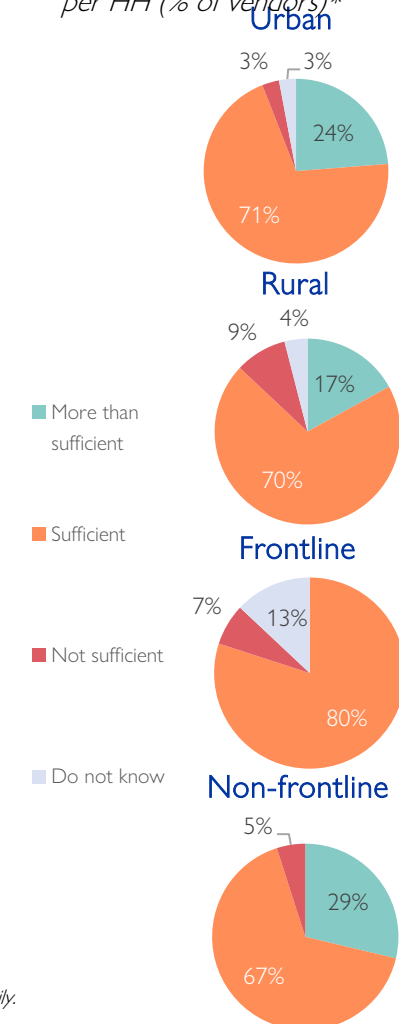
Perception of how demand, supply and price are expected in the coming month (% of vendors)*



Median price for briquettes by oblast (UAH)



Perception on the recommended seasonal quantity of briquettes (4.5mt) per HH (% of vendors)*



Peat briquettes (high quality): Consist of shredded peat, compressed to form a virtually smokeless, slow-burning, easily stored and transported fuel. Often used as the sole fuel for a fire, they are also used to light a coal fire quickly and easily.

Wood briquettes (high quality): Wood briquettes are a fuel source made out of dried, compacted wood. They are made from wood waste or by-products and machine-compressed into a log or block shape.

Sunflower husk briquettes (low quality): Composed of compressed sunflower husks, the briquettes have moderate thermal conductivity but produce significant amounts of ash and have low moisture resistance.

*According to the Shelter and NFI Cluster guidelines

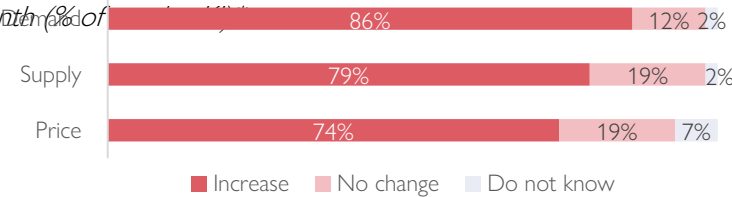
COAL

Median price of coal according to interviewed vendors

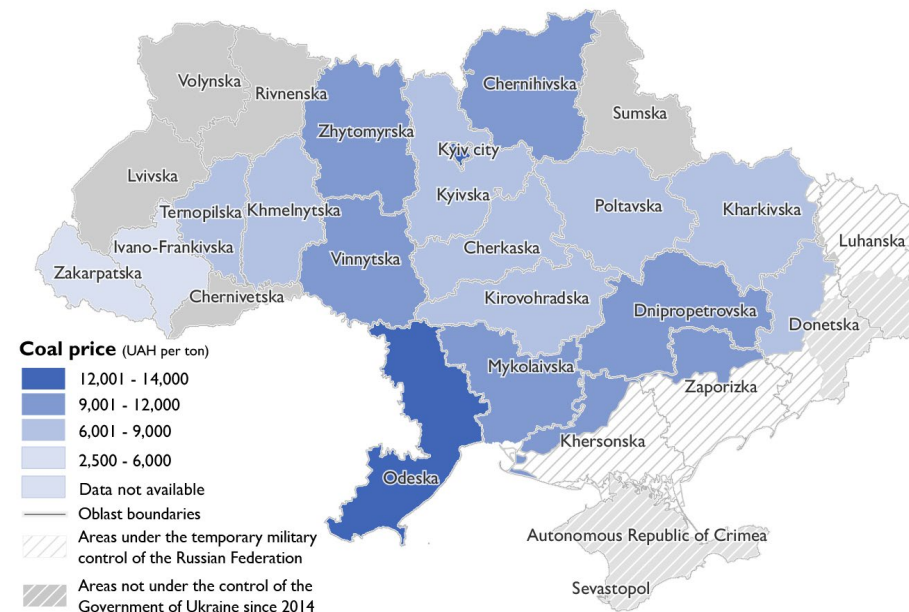
Median price per unit	9,182 UAH per ton
Median price per unit by vendor location	
Urban	10,250 UAH per ton
Rural	8,500 UAH per ton
Frontline	10,000 UAH per ton
Non-frontline	9,000 UAH per ton
Median price per unit by vendor type	
Direct manufacture market	8,000 UAH per ton
Individual distributor	10,000 UAH per ton
Large trading network	13,000 UAH per ton
Wholesale point	11,750 UAH per ton
Other	6,000 UAH per ton
Median price per unit by quality	
Low	7,000 UAH per ton
High	9,750 UAH per ton

PERCEPTIONS FOR THE COMING MONTH

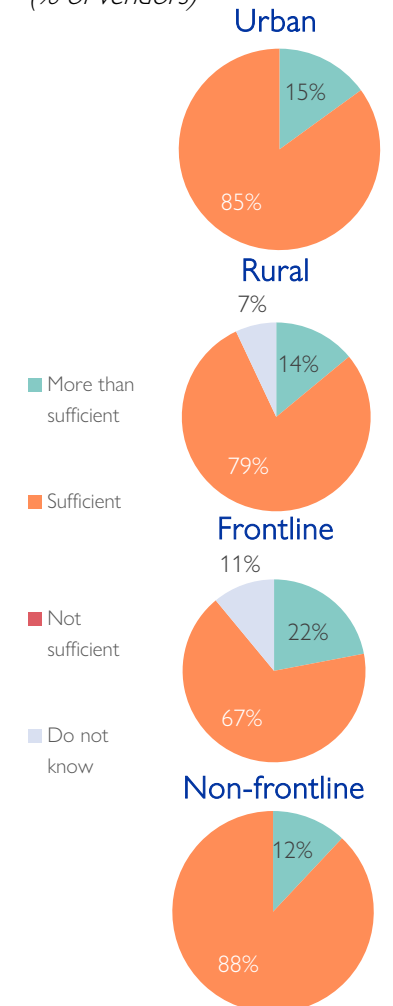
Perception of how demand, supply and price are expected in the coming month (% of vendors)



Median price for coal by oblast (UAH)



Perception on the recommended seasonal quantity of coal (4mt) per HH (% of vendors)*



Anthracite (high quality): Anthracite is a high-quality coal, which has a high thermal conductivity and a long combustion time.
Gas coal (high quality): A type of coal with a thermal conductivity and combustion time between that of anthracite and brown coal.
Brown coal (low quality): Brown coal is "immature" hard coal. Among all types of coal, it is considered the lowest quality fuel, as it emits much less heat.

*According to the Shelter and NFI Cluster guidelines

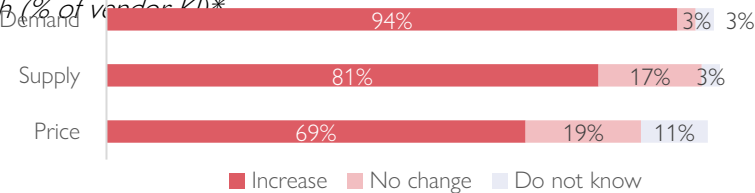
PELLETS

Median price of pellets according to interviewed vendors

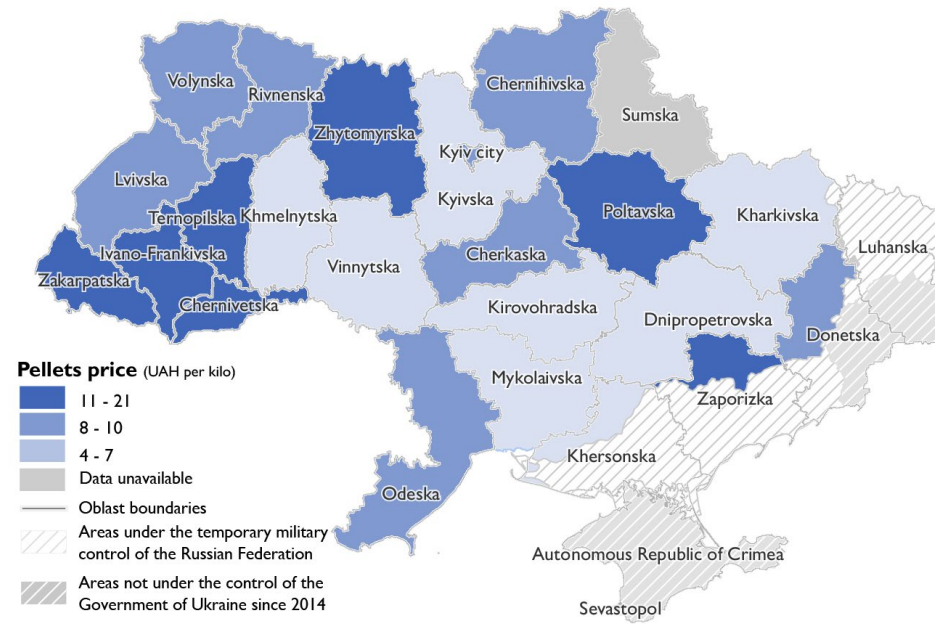
Median price per unit	9 UAH per kg
Median price per unit by vendor location	
Urban	8 UAH per kg
Rural	9 UAH per kg
Frontline	7 UAH per kg
Non-frontline	8 UAH per kg
Median price per unit by vendor type	
Direct manufacture market	8 UAH per kg
Individual distributor	8 UAH per kg
Large trading network	14 UAH per kg
Wholesale point	7 UAH per kg
Other	12 UAH per kg
Median price per unit by quality	
Low	6 UAH per kg
High	9 UAH per kg

PERCEPTIONS FOR THE COMING MONTH

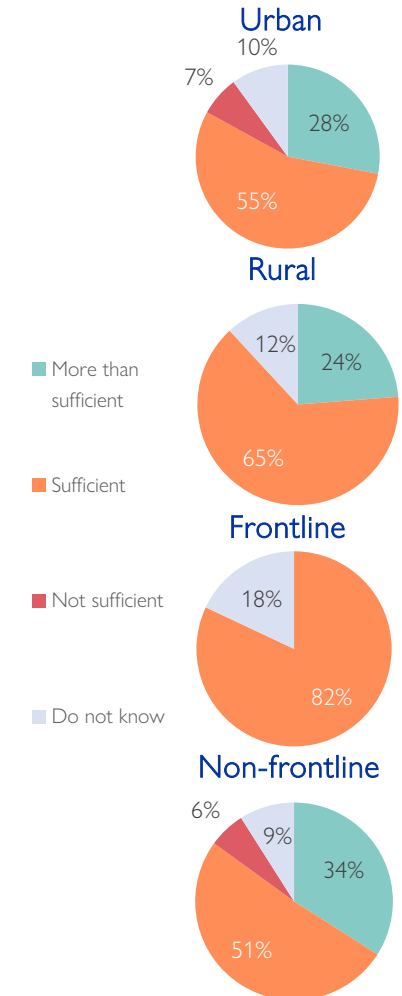
Perception of how demand, supply and price are expected in the coming month (% of vendors KPI)*



Median price for pellets by oblast (UAH)



Perception on the recommended seasonal quantity of pellets (6mt) per HH (% of vendors)*



Wood pellets: (high quality): Wood pellets have high calorific value, low ash content, and burn without visible smoke.
Straw pellets: (high quality): Small, compressed bale of straw that can be burned in a stove or furnace.
Sunflower husk pellets: (low quality): Small, compressed husks of sunflower seeds with a higher ash content (compared to wood pellets).

*According to the Shelter and NFI Cluster guidelines

WINTERIZATION NEEDS OVERVIEW

The table below displays the percentage of Key Informants* reporting each winterization need, by oblast and by type of location.

Oblast	Residential insulation	Access to shelter	Shelter repair	Solid fuel heating appliances	Electrical heating appliances	Affordability of access to central heating lines	Connection to central heating lines	Sufficient supply of central heating	Solid fuel distribution	Winter clothing	Access to points of invincibility	Access to stable power supply	Do not know	Other
Cherkaska	43%	43%	43%	86%	29%	43%	29%	29%	57%	0%	0%	21%	14%	0
Chernihivska	100%	36%	79%	100%	43%	64%	21%	14%	86%	0%	0%	43%	0%	0%
Chernivetska	13%	0%	0%	13%	0%	13%	0%	38%	0%	0%	0%	88%	0%	0%
Dnipropetrovska	25%	0%	0%	100%	100%	75%	75%	13%	25%	0%	0%	0%	0%	0%
Donetska	100%	0%	0%	57%	0%	43%	0%	43%	71%	71%	0%	100%	0%	0%
Ivano-Frankivska	33%	11%	11%	22%	0%	0%	0%	22%	11%	11%	22%	89%	0%	11%
Kharkivska	88%	38%	50%	63%	38%	50%	25%	50%	63%	25%	0%	50%	0%	0%
Khersonska	88%	13%	0%	63%	0%	50%	0%	50%	50%	88%	0%	100%	0%	0%
Khmelnyska	80%	20%	20%	20%	0%	20%	10%	20%	30%	60%	0%	70%	20%	0%
Kirovohradska	40%	0%	10%	60%	50%	60%	40%	10%	40%	10%	0%	10%	0%	0%
Kyiv city	100%	80%	100%	100%	100%	100%	80%	100%	100%	0%	0%	100%	0%	0%
Kyivska	0%	0%	0%	60%	0%	0%	0%	20%	40%	0%	0%	20%	40%	0%
Lvivska	78%	11%	22%	44%	0%	11%	0%	0%	11%	22%	44%	67%	11%	0%
Mykolaivska	31%	23%	62%	62%	15%	0%	15%	0%	0%	0%	0%	38%	0%	15%
Odeska	0%	0%	0%	0%	0%	100%	0%	100%	0%	0%	0%	100%	0%	0%
Poltavska	20%	10%	10%	80%	60%	50%	40%	40%	40%	0%	0%	10%	20%	0%
Rivnenska	63%	0%	13%	75%	38%	0%	0%	13%	38%	25%	63%	50%	13%	0%
Sumska	38%	25%	38%	50%	13%	63%	0%	38%	63%	25%	38%	63%	13%	0%
Ternopil'ska	60%	0%	0%	20%	20%	30%	0%	40%	10%	0%	0%	80%	0%	10%
Vinnyska	67%	25%	58%	83%	75%	42%	25%	25%	75%	8%	8%	75%	0%	0%
Volynska	13%	0%	0%	0%	13%	0%	0%	0%	13%	0%	0%	50%	38%	0%
Zakarpatska	33%	0%	0%	11%	0%	0%	0%	0%	11%	0%	0%	67%	0%	11%
Zaporizka	33%	0%	0%	67%	33%	67%	22%	78%	67%	44%	0%	56%	0%	11%
Zhytomyrska	20%	0%	0%	60%	20%	7%	7%	7%	40%	13%	0%	7%	20%	7%
Rural	44%	6%	15%	51%	17%	19%	6%	16%	36%	20%	7%	52%	11%	5%
Urban	56%	22%	31%	59%	36%	51%	25%	40%	41%	11%	6%	53%	4%	5%
Frontline	83%	20%	33%	70%	24%	57%	13%	43%	69%	37%	6%	65%	2%	0%
Non-frontline	40%	12%	20%	51%	28%	29%	17%	23%	29%	9%	7%	49%	9%	6%

* Reference to key informants (KIs) include answers provided by both vendors and community focal points (CFPs).

AVAILABILITY OF HEATING SYSTEMS

The table below displays the estimated percentage of the resident population with access to gas, electricity and solid fuel systems as a heating modality, per oblast.*

Oblast	Estimated max. total population present**	% of residents with access to gas as a heating modality	% of residents with access electricity as a heating modality	% of residents utilising solid fuel as a heating modality	% of residents with access to solid fuel burning appliances
Cherkaska	1,330,000	Majority/All (76-100%)	Majority/All (76-100%)	Few (1-25%)	Few (1-25%)
Chernihivska	1,187,000	Most (51-75%)	Majority/All (76-100%)	Few (1-25%)	Few (1-25%)
Chernivetska	849,000	Some (26-50%)	Few (1-25%)	Some (26-50%)	Some (26-50%)
Dnipropetrovska	4,272,000	Most (51-75%)	Majority/All (76-100%)	Some (26-50%)	Some (26-50%)
Ivano-Frankivska	1,296,000	Majority/All (76-100%)	Some (26-50%)	Some (26-50%)	Some (26-50%)
Kharkivska	2,978,000	Majority/All (76-100%)	Majority/All (76-100%)	Few (1-25%)	Few (1-25%)
Khmelnyska	1,250,000	Most (51-75%)	Some (26-50%)	Most (51-75%)	Most (51-75%)
Kirovohradska	1,148,000	Some (26-50%)	Some (26-50%)	Some (26-50%)	Some (26-50%)
Kyiv city	3,853,000	Majority/All (76-100%)	Majority/All (76-100%)	Few (1-25%)	Few (1-25%)
Kyivska	3,229,000	Some (26-50%)	Majority/All (76-100%)	Some (26-50%)	Some (26-50%)
Lvivska	2,640,000	Majority/All (76-100%)	Most (51-75%)	Some (26-50%)	Some (26-50%)
Mykolaivska	1,320,000	Most (51-75%)	Most (51-75%)	Some (26-50%)	Some (26-50%)
Odeska	2,581,000	Majority/All (76-100%)	Few (1-25%)	Few (1-25%)	Few (1-25%)
Poltavska	1,701,000	Most (51-75%)	Some (26-50%)	Some (26-50%)	Some (26-50%)
Rivnenska	1,088,000	Majority/All (76-100%)	Majority/All (76-100%)	Few (1-25%)	Few (1-25%)
Sumska	1,125,000	Majority/All (76-100%)	Some (26-50%)	Some (26-50%)	Some (26-50%)
Ternopilska	894,000	Some (26-50%)	Most (51-75%)	Some (26-50%)	Some (26-50%)
Vinnyska	1,794,000	Most (51-75%)	Majority/All (76-100%)	Some (26-50%)	Some (26-50%)
Volynska	1,109,000	Some (26-50%)	Few (1-25%)	Most (51-75%)	Majority/All (76-100%)
Zakarpatska	900,000	Most (51-75%)	Few (1-25%)	Few (1-25%)	Few (1-25%)
Zhytomyrska	1,349,000	Most (51-75%)	Few (1-25%)	Some (26-50%)	Some (26-50%)
Donetska**	726,000	Few (1-25%)	Few (1-25%)	Some (26-50%)	Most (51-75%)
Khersonska**	433,000	Most (51-75%)	Some (26-50%)	Some (26-50%)	Some (26-50%)
Zaporizka**	1,261,000	Majority/All (76-100%)	Few (1-25%)	Most (51-75%)	Most (51-75%)
Rural		Most (51-75%)	Few (1-25%)	Most (51-75%)	Most (51-75%)
Urban		Majority/All (76-100%)	Majority/All (76-100%)	Few (1-25%)	Few (1-25%)
Frontline		Most (51-75%)	Most (51-75%)	Some (26-50%)	Some (26-50%)
Non-frontline		Majority/All (76-100%)	Most (51-75%)	Some (26-50%)	Some (26-50%)

* Findings should not be considered representative at the oblast level, as the responses from vendors and CFPs have been aggregated to provide an overview of household' access to each heating modality.

** The data presented in this table is taken from IOM's General Population Survey (GPS), itself derived using UNFPA's revised total population baseline, dated October 2022. Population estimates in Donetska, Zaporizka and Khersonska Oblasts are under-represented due to coverage of government-controlled areas only, as well as the limited number of respondents reached through the random digit dial of the General Population Survey.

METHODOLOGICAL NOTE

The Solid Fuel Assessment is a bi-monthly product developed by the Data and Analytics (D&A) unit to identify the needs and supplies of solid fuels for Ukrainian households across the country. Additionally, it seeks to estimate the prices of solid fuel items, also supporting humanitarian winterization operations. The tool investigates the supply, demand and price of essential solid fuel products at the time of the assessment, also acquiring information from key informants on the forecasted prices and availability for the upcoming month, as well as the sources and needs of local populations. Data collection takes place over a 10-day period, every two months across all 23 oblasts that data collection experts currently have access to. The results are presented bi-monthly, and successive rounds aim to monitor trends to highlight changes in prices or disruptions within the supply chain over the winter season.

The assessment involves the active participation of vendors and community focal points (CFPs) who serve as primary sources of information on the main types of solid fuels in Ukraine. At least two locations per oblast are assessed, including the main urban centre and a rural and/or near frontline area. For each market, interviews with vendors gather information on the price, quantity and quality of each item, as well as perceptions regarding the availability and quality of each fuel item. Within each of these locations, a minimum of two vendors and two CFPs are assessed through face-to-face or remote interviews. The introduction of CFPs was undertaken to facilitate a more comprehensive analysis of supply dynamics at the household level within each location. In cases where it was not possible to interview vendors for all fuel types, markets in nearby locations were assessed to integrate missing information. Beyond these general indications, locations, vendors and CFPs were selected through purposive sampling. The results reported, therefore cannot be considered as representative – they do, however, provide snapshot examples of the solid fuel market in different areas of the country.

For the purpose of this assessment, urban and rural locations are distinguished based on population estimates, with rural localities having <20,000 persons present. Furthermore, in Chernihivska, Donetsk, Dnipropetrovska, Kharkivska, Khersonska, Mykolaivska and Sumska Oblasts, locations were further classified as near the frontline to support humanitarian understanding on the extent to which frontline proximity may influence supply, demand, price of solid fuel items and other winterization needs.

The main marketplace types included in this report are:

- **Direct solid fuel manufacturer:** market where the manufacturer sells the product directly to the final customer. Direct manufacture market is where the manufacturer sells the product directly to the final customer.
- **Individual distributor:** retailer/reseller who sales solid fuel in insignificant amount (private entrepreneur)
- **Wholesale point:** market for retailers, industrial, commercial, institutional, or professional users or other wholesalers.
- **Local shop:** market where solid fuel retail sales take place (e.g., small stores, local markets, unauthorized markets).
- **Large trading network:** marketplace with mixed assortment specializing in the retail trade of various goods, including solid fuel. Has a wide range of different goods (Epicentr, large warehouses etc.).
- **Other** Types of private entrepreneur and markets that do not fit into the above categories

Furthermore, to partially address quality variations in solid fuel sold in different markets, the assessment distinguishes between high and low quality for each item. While these categories do not fully account for all available products, they are generally recognised as having clearly distinguishable quality which may impact the heat generation. For instance, hardwood is considered of higher quality than softwood due to its high heat transfer. Similarly, dark coal is deemed of higher quality than brown coal.