

OVERVIEW

Map 1: Locations assessed in October 2023

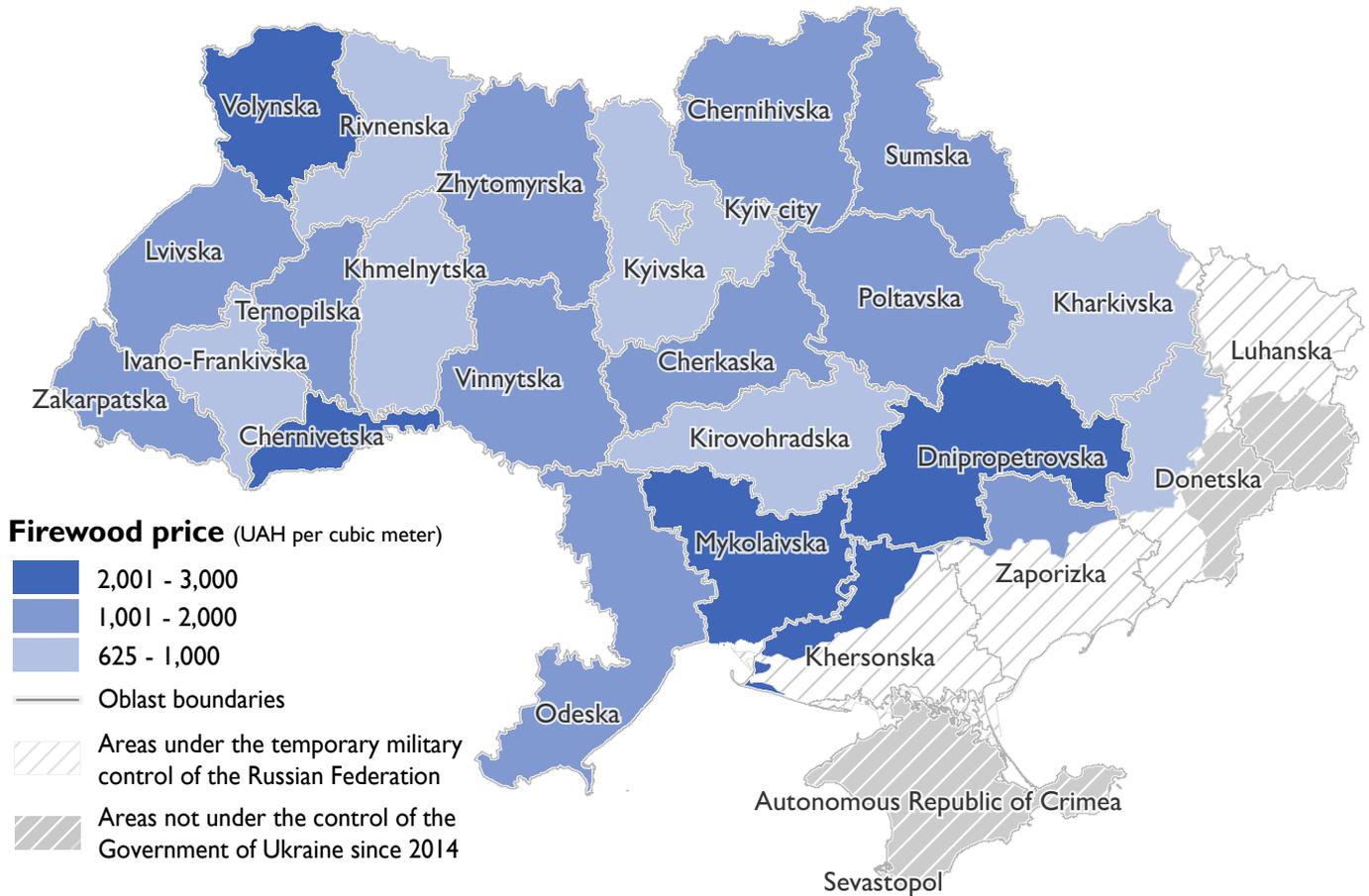
The following report serves to identify heating systems in use across Ukrainian households, the estimated price of solid fuel items across oblasts, and the frequency at which and the means through which populations collect solid fuel items, in support of ongoing humanitarian winterization operations. 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 2023, the Data and Analytics (D&A) team surveyed 314 markets in 23 oblasts and Kyiv City in Ukraine, conducting face-to-face and remote interviews with both local vendors and community focal points (CFPs). 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

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KEY FINDINGS



The majority of vendors anticipate increases in demand of solid fuels, but no change in the supply of solid fuels in the coming month. A broadly similar share of vendors expect prices to increase or to remain the same over the next month.



Sourcing of solid fuels was primarily done on a seasonal basis, particularly in urban and non-frontline areas. Populations in urban and frontline areas were more likely to receive solid fuel as needed.



Vendors indicated that individual distributors were the main source of solid fuels. In contrast to other location types – where populations obtained solid fuels at direct manufacture markets – the second-most prevalent source of solid fuels in frontline areas was wholesale points.



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.



Few have access to solid fuels in Chernihivska, Zakarpatska, Ivano-Frankiska and Volynska Oblasts, as reported by the majority of KIs in these oblasts.



A significant increase in the price of coal was reported since August 2023, driven by growth in demand for coal across the country.



Donetska and Kirovohradska Oblasts were the only regions where the majority of KIs reported that few or no residents had access to gas heating systems. By contrast, few residents have access to electric heating systems in several regions, including Zakarpatska, Zhytomyrska, Kharkivska, Vinnytska, Volynska and Sumska Oblasts. The lack of secondary or tertiary heating methods may compromise the resilience of households during ongoing winter challenges.



Residential insulation was reported as a key winter need by most KIs in Ivano-Frankiska, Volynska, Mykolaivska and Kirovohradska Oblasts. Other significant winter needs included affordability of access to central heating lines (in Sumska, Cherkaska and Ivano-Frankiska Oblasts), distribution of solid fuels (in Chernihivska, Khmelnytska, Ternopilska, and Kirovohradska Oblasts) and access to a stable power line (in Ternopilska, Mykolaivska and Vinnytska Oblasts).

PRICE OVERVIEW

Table 1: Median price per unit of solid fuels

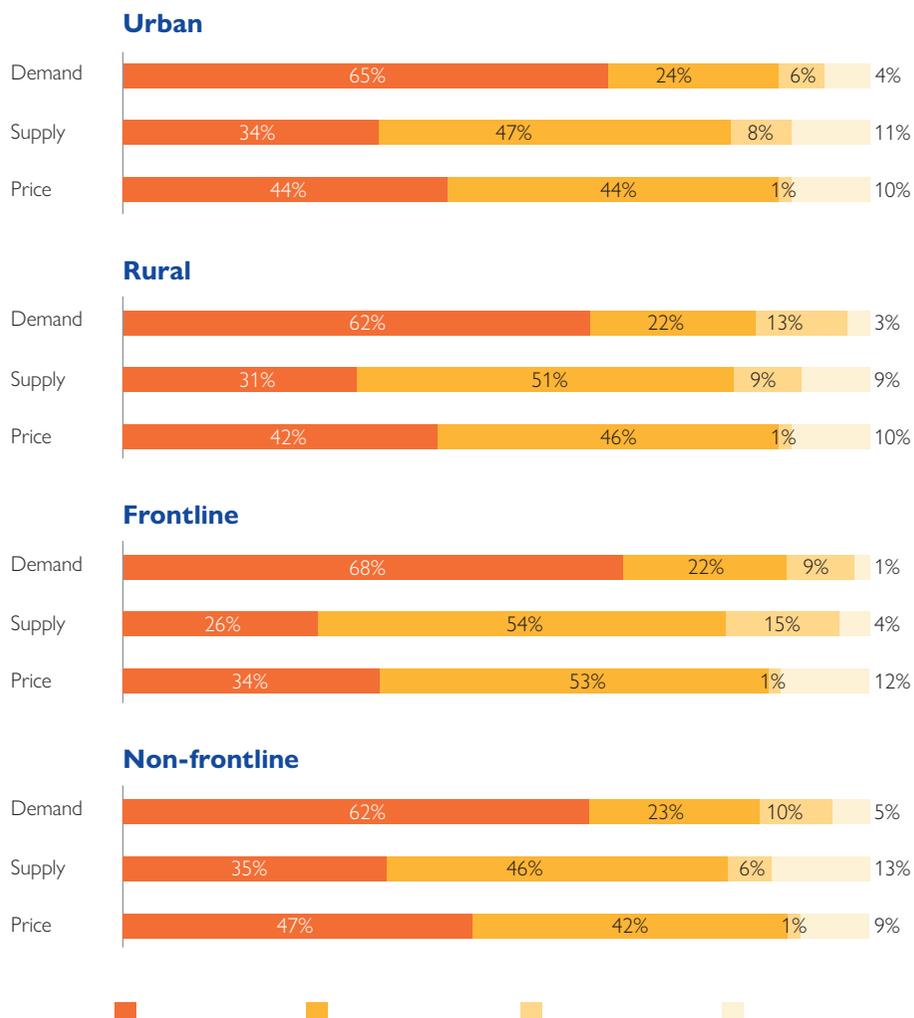
Solid fuel type	Median price per unit (not including transportation)
Firewood	1,463 UAH/stacked m ³
Coal	10,289 UAH/ton
Briquettes	8 UAH/kg
Pellets	8 UAH/kg

DEFINITIONS

1. For the purpose of this assessment, markets are defined as shops or vendors which supply solid fuel items. More information regarding the different market types surveyed in this assessment may be found on page 10 (Methodological Note).
2. The assessment utilised Shelter and Non-Food Items (NFI) Cluster indicators to evaluate the adequacy of recommended solid fuel quantities for seasonal household 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.
3. Urban and rural areas are distinguished based on population estimates, with rural areas having <20,000 estimated residents. The categorization of frontline and non-frontline locations applies solely to oblasts near the frontline (i.e., Chernihivska, Donetska, Dnipropetrovska, Kharkivska, Khersonska, Mykolaivska, and Sumska Oblasts). Frontline and near-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.
4. Key informants (KIs) interviewed for the purpose of this assessment included both local vendors and community focal points (CFPs), notably public officials, community leaders, teachers, healthcare workers and members of civil society.
5. 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.

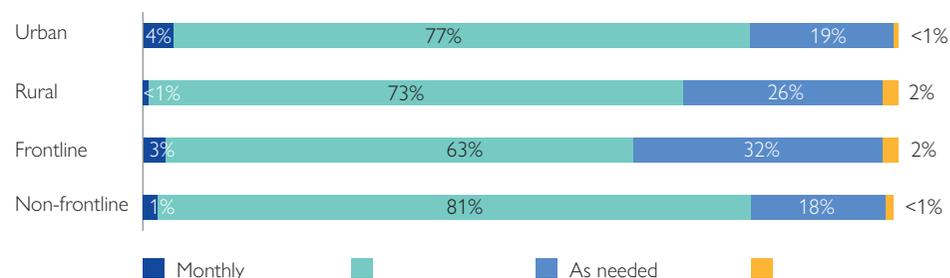
VENDOR EXPECTATIONS

Figure 1: Vendor expectations of changes in the demand, supply and price of solid fuels over the month following the interview, by location type



FREQUENCY OF SOURCING*

Figure 2: Frequency of sourcing of solid fuels, by location type



METHOD OF SOURCING*

Table 2: Means by which populations source solid fuels, by location type

Method of sourcing	Urban	Rural	Frontline	Non-frontline
Direct manufacture market	57%	58%	68%	53%
Individual distributor	44%	41%	14%	55%
Large trading network	28%	10%	32%	15%
Local shop	16%	18%	25%	13%
Wholesale point	8%	13%	5%	13%
Community self-organization	15%	1%	11%	8%
Aid distribution	12%	4%	11%	8%
Private sellers who sell fuel from trucks on the street or in the market	4%	2%	3%	3%
Self preparation and unofficial sell	4%	6%	3%	6%
Other	2%	2%	2%	2%

* Questions regarding frequency and method of sourcing were only posed to community focal points (CFPs), as representatives of the communities assessed, with the goal of capturing communities' sourcing behaviour, and are indicative of community trends.

FIREWOOD

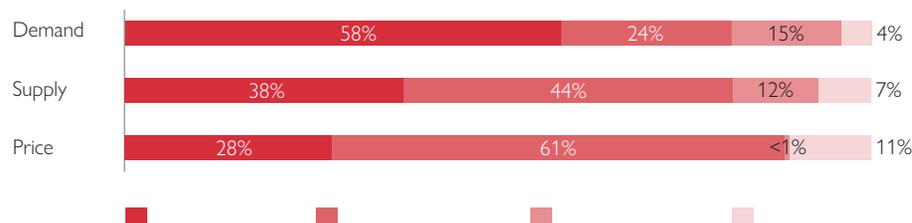
Table 3: KI estimates of median price per unit of firewood, by vendor location, vendor type, and quality

Median price per unit	1,463 UAH per stacked m ³
Median price per unit by vendor location	
Urban	1,700 UAH per stacked m ³
Rural	1,200 UAH per stacked m ³
Frontline	1,429 UAH per stacked m ³
Non-frontline	1,500 UAH per stacked m ³
Median price per unit by vendor type	
Direct manufacture market	1,104 UAH per stacked m ³
Individual distributor	1,429 UAH per stacked m ³
Large trading network	1,950 UAH per stacked m ³
Local shop	800 UAH per stacked m ³
Wholesale point	2,100 UAH per stacked m ³
Other	1,700 UAH per stacked m ³
Median price per unit by quality	
Low	1,125 UAH per stacked m ³
High	1,500 UAH per stacked m ³

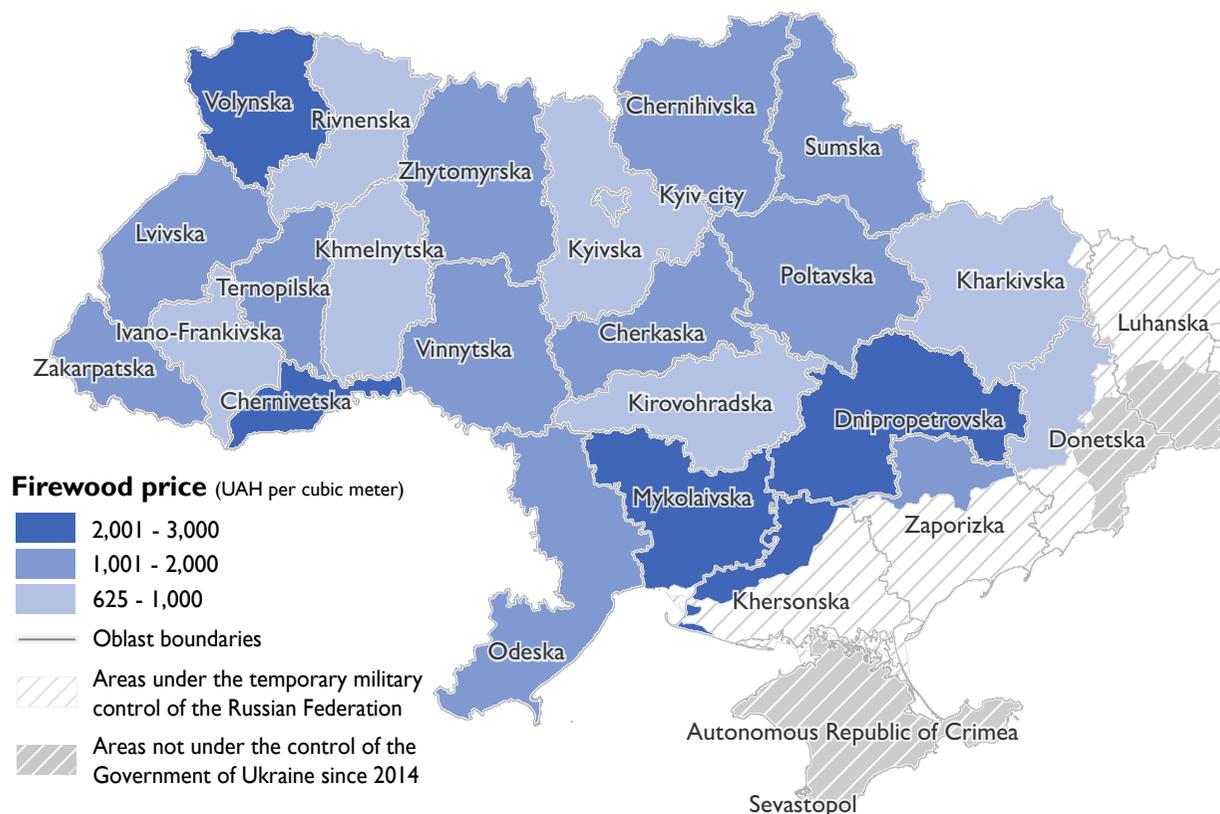
Hardwood (high quality): derives from trees that are slower growing and has a high thermal conductivity. It is therefore a slow burning and efficient solid fuel source.

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.

Figure 3: Key informant expectations of changes in the demand, supply and price of firewood over the month following the interview, by location type (% of KIs)



Map 2. Median price for firewood by oblast (UAH)



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COAL

Table 4: KI estimates of median price per unit of coal, by vendor location, vendor type, and quality

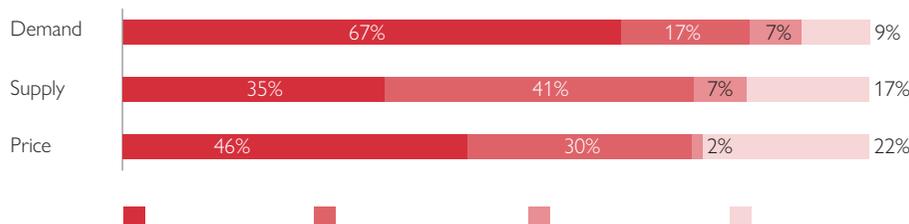
Median price per unit	10,289 UAH per stacked m ³
Median price per unit by vendor location	
Urban	11,650 UAH per ton
Rural	10,000 UAH per ton
Frontline	9,900 UAH per ton
Non-frontline	10,650 UAH per ton
Median price per unit by vendor type	
Direct manufacture market	3,500 UAH per ton
Individual distributor	10,000 UAH per ton
Large trading network	12,400 UAH per ton
Local shop	5,000 UAH per ton
Wholesale point	11,000 UAH per ton
Other	7,000 UAH per ton
Median price per unit by quality	
Low	6,000 UAH per ton
High (Hard Coal)	11,000 UAH per ton
High (Long Flame Coal)	10,900 UAH per ton

Anthracite (high quality): Anthracite is a high-quality coal, which has a high thermal conductivity and a long combustion time.

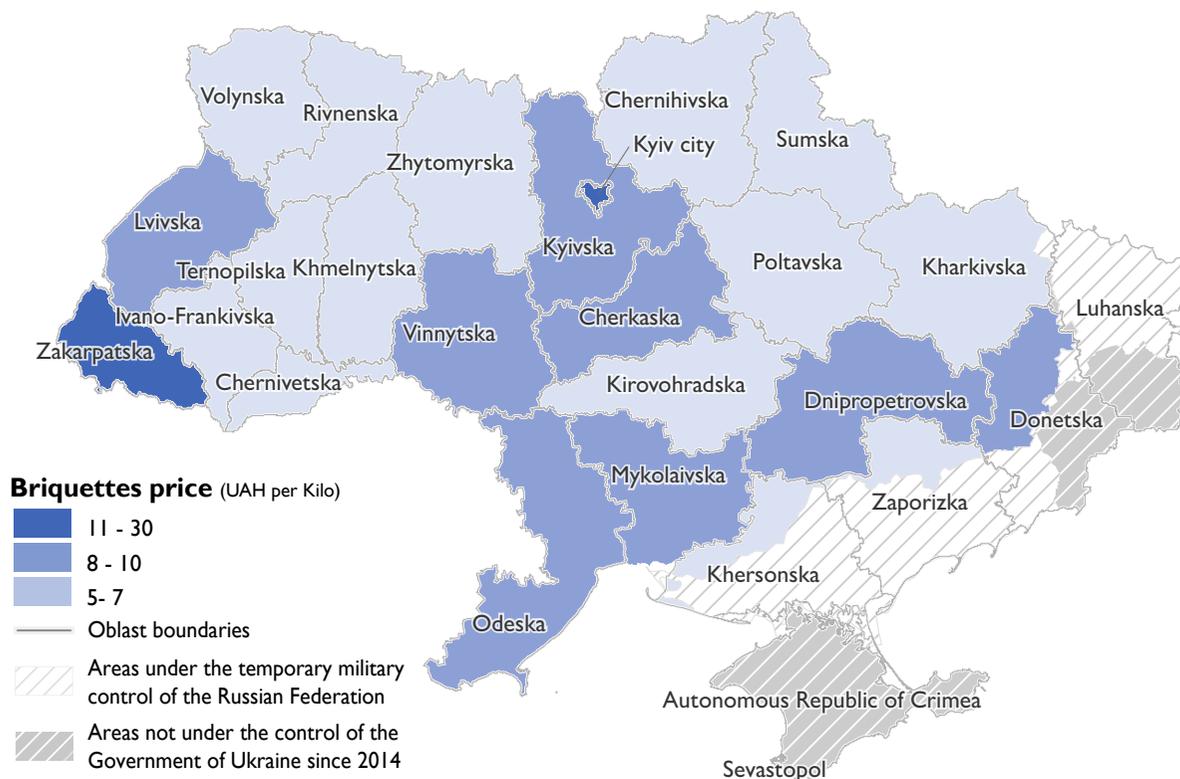
Gas coal (high quality): A type of coal with a thermal conductivity and combustion time between that of anthracite and brown coal.

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.

Figure 4: Key informant expectations of changes in the demand, supply and price of coal over the month following the interview, by location type (% of KIs)



Map 3. Median price for coal by oblast (UAH)



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BRIQUETTES

Table 5: KI estimates of median price per unit of briquettes, by vendor location, vendor type, and quality

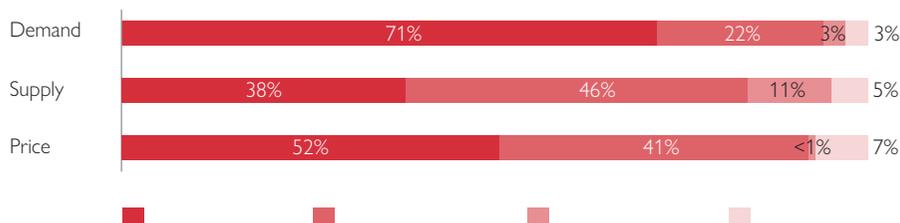
Median price per unit	8 UAH per kg
Median price per unit by vendor location	
Urban	7 UAH per kg
Rural	7 UAH per kg
Frontline	7 UAH per kg
Non-frontline	7 UAH per kg
Median price per unit by vendor type	
Direct manufacture market	7 UAH per kg
Individual distributor	7 UAH per kg
Large trading network	11 UAH per kg
Local shop	6 UAH per kg
Wholesale point	8 UAH per kg
Other	6 UAH per kg
Median price per unit by quality	
Low	6 UAH per kg
High	7 UAH per kg

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 ash low moisture resistance.

Figure 5. Key informant expectations of changes in the demand, supply and price of briquettes over the month following the interview, by location type (% of KIs)



Map 4. Median price for briquettes by oblast (UAH)



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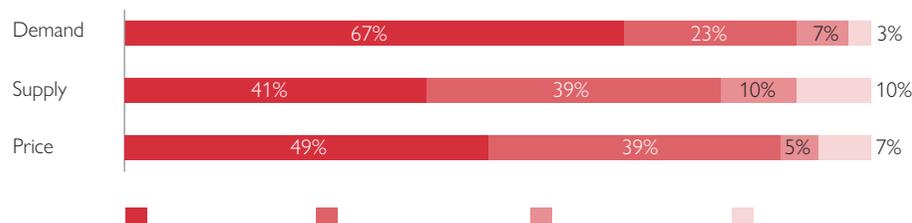
PELLETS

Table 6: KI estimates of median price per unit of pellets, by vendor location, vendor type, and quality

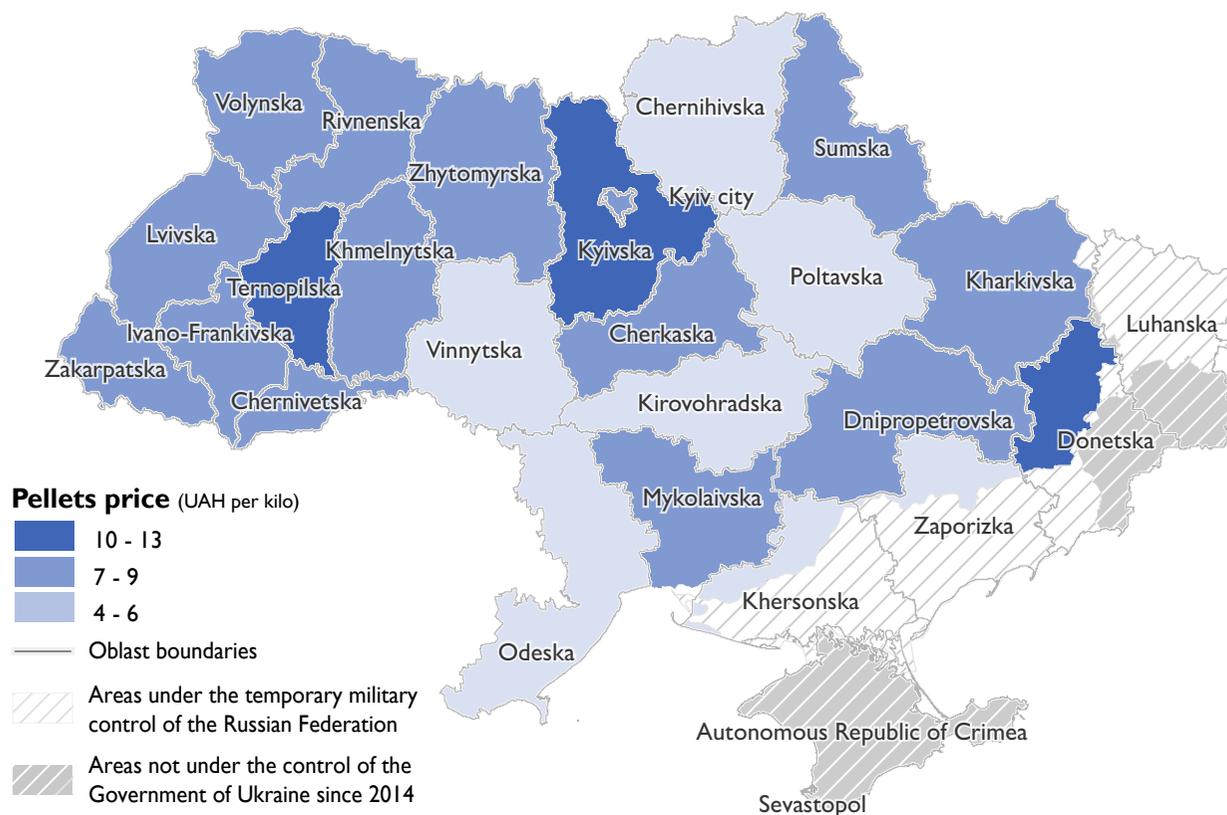
Median price per unit	8 UAH per kg
Median price per unit by vendor location	
Urban	8 UAH per kg
Rural	7 UAH per kg
Frontline	6 UAH per kg
Non-frontline	8 UAH per kg
Median price per unit by vendor type	
Direct manufacture market	7 UAH per kg
Individual distributor	7 UAH per kg
Large trading network	9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

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

Figure 6. Key informant expectations of changes in the demand, supply and price of pellets over the month following the interview, by location type (% of KIs)



Map 5. Median price for pellets by oblast (UAH)



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WINTERIZATION NEEDS OVERVIEW

Oblast	% Residential insulation	% Access to stable power supply	% Affordability of access to central heating lines	% SF distribution	% SF heating appliances	% Sufficient supply of central heating	% Electrical heating appliances	% Shelter repair	% Winter clothing	% Connection to central heating lines	% Access to shelter	% Access to points of invincibility	% Other	% Don't know
Cherkaska	32%	16%	84%	53%	0%	32%	0%	0%	0%	21%	0%	0%	11%	0%
Chernihivska	90%	0%	80%	90%	90%	40%	0%	70%	0%	20%	70%	0%	0%	0%
Chernivetska	80%	20%	0%	10%	40%	0%	0%	10%	20%	10%	0%	0%	0%	10%
Dnipropetrovska	50%	56%	61%	33%	39%	28%	28%	6%	6%	17%	0%	0%	0%	0%
Donetska	40%	40%	40%	40%	40%	10%	30%	20%	20%	0%	20%	0%	10%	0%
Ivano-Frankivska	79%	100%	71%	57%	43%	36%	29%	14%	29%	7%	21%	21%	14%	0%
Kharkivska	75%	33%	46%	63%	38%	13%	46%	4%	38%	4%	4%	0%	0%	0%
Khersonska	80%	100%	53%	100%	80%	20%	60%	27%	47%	40%	0%	27%	0%	0%
Khmelnyska	100%	100%	100%	88%	75%	63%	38%	38%	50%	50%	25%	25%	0%	0%
Kirovohradska	58%	100%	33%	75%	58%	58%	67%	0%	42%	0%	8%	58%	0%	0%
Kyiv city	40%	80%	60%	60%	80%	80%	60%	20%	0%	0%	40%	0%	0%	0%
Kyivska	80%	20%	20%	60%	80%	0%	20%	60%	0%	0%	40%	0%	0%	20%
Lvivska	88%	38%	25%	0%	19%	6%	0%	0%	0%	0%	13%	0%	0%	0%
Mykolaivska	58%	83%	33%	25%	42%	33%	8%	67%	17%	33%	8%	0%	0%	0%
Odeska	0%	40%	80%	0%	0%	20%	0%	0%	0%	0%	0%	0%	30%	10%
Poltavska	75%	100%	58%	67%	83%	58%	50%	25%	17%	25%	0%	42%	0%	0%
Rivnenska	40%	60%	40%	50%	80%	30%	30%	30%	0%	20%	10%	30%	0%	0%
Sumska	32%	42%	95%	47%	0%	79%	5%	0%	5%	5%	0%	0%	0%	0%
Ternopil'ska	100%	92%	75%	92%	92%	83%	33%	25%	75%	50%	8%	8%	0%	0%
Vinnyska	33%	67%	11%	28%	17%	0%	6%	0%	0%	0%	6%	0%	22%	6%
Volyn'ska	69%	23%	38%	0%	15%	31%	15%	0%	0%	0%	0%	0%	0%	0%
Zakarpatska	75%	25%	8%	8%	33%	0%	25%	58%	8%	0%	0%	0%	58%	0%
Zaporizka	57%	43%	64%	7%	7%	14%	21%	14%	7%	21%	0%	0%	0%	0%
Zhytomyrska	19%	0%	0%	31%	0%	0%	13%	0%	13%	0%	0%	0%	0%	56%
Rural	60%	47%	35%	52%	20%	18%	20%	16%	17%	7%	7%	8%	7%	4%
Urban	58%	56%	63%	36%	27%	40%	27%	16%	16%	19%	10%	8%	6%	4%
Frontline	62%	45%	63%	58%	38%	30%	29%	17%	22%	14%	11%	4%	1%	0%
Other	58%	55%	44%	38%	38%	28%	21%	16%	14%	13%	7%	9%	8%	6%

OBLAST-LEVEL METHOD OF SOURCING

Oblast	% Individual distributor	% Direct manufacture market	% Wholesale point	% Local shop	% Community self-organization	% Large trading network	% Aid distribution	% private sellers who sell fuel from trucks on the street or in the market	% Self preparation and unofficial sell	% Other
Cherkaska	50%	92%	25%	25%	0%	0%	8%	0%	0%	0%
Chernihivska	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Chernivetska	86%	29%	43%	71%	0%	0%	0%	0%	0%	0%
Dnipropetrovska	43%	14%	7%	21%	29%	7%	0%	29%	0%	0%
Ivano-Frankivska	57%	0%	29%	71%	14%	0%	0%	29%	0%	0%
Kharkivska	56%	89%	33%	0%	0%	0%	0%	0%	0%	22%
Khmelnytska	63%	25%	25%	0%	0%	25%	0%	0%	0%	6%
Kirovohradska	59%	6%	35%	59%	12%	12%	41%	0%	12%	0%
Kyiv city	40%	80%	0%	0%	0%	0%	0%	0%	0%	0%
Kyivska	100%	22%	0%	0%	0%	0%	0%	0%	0%	0%
Lvivska	100%	0%	0%	0%	25%	0%	0%	0%	25%	0%
Mykolaivska	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Odeska	57%	57%	43%	0%	0%	57%	0%	0%	0%	0%
Poltavska	8%	50%	0%	0%	67%	0%	83%	0%	8%	0%
Rivnenska	50%	0%	25%	75%	0%	25%	0%	0%	0%	0%
Sumska	71%	57%	71%	0%	0%	14%	0%	0%	29%	0%
Ternopil'ska	50%	50%	25%	0%	25%	0%	0%	0%	0%	0%
Vinnytska	100%	13%	0%	0%	0%	13%	0%	0%	0%	0%
Volyn'ska	33%	89%	0%	0%	0%	6%	0%	0%	28%	0%
Zakarpatska	40%	80%	0%	20%	20%	0%	0%	0%	0%	0%
Zhytomyrska	38%	85%	8%	0%	0%	23%	0%	0%	0%	0%
Donetska*	25%	50%	0%	25%	50%	0%	0%	0%	0%	25%
Kherson'ska*	56%	33%	89%	11%	0%	0%	0%	0%	0%	0%
Zaporizka*	100%	17%	0%	50%	17%	0%	0%	0%	0%	0%

Other option includes "private sellers who sell fuel from trucks on the street or in the market", "Self preparation and unofficial sell", "solid fuel from neighbors or from people who prune trees on the streets", "Unofficial sellers and/or illegal distributors of SF"

OBLAST-LEVEL FREQUENCY OF SOURCING

Oblast	As distributed (aid)	As needed	Monthly	Seasonally
Cherkaska	0%	17%	0%	83%
Chernihivska	0%	17%	0%	83%
Chernivetska	0%	71%	0%	29%
Dnipropetrovska	0%	14%	0%	86%
Ivano-Frankivska	0%	14%	0%	86%
Kharkivska	0%	11%	0%	89%
Khmelnitska	0%	44%	0%	56%
Kirovohradska	6%	41%	6%	47%
Kyiv city	0%	0%	0%	100%
Kyivska	0%	33%	0%	67%
Lvivska	0%	0%	0%	100%
Mykolaivska	0%	50%	0%	50%
Odeska	0%	0%	0%	100%
Poltavska	0%	0%	0%	100%
Rivnenska	0%	0%	25%	75%
Sumska	0%	0%	0%	100%
Ternopilska	0%	50%	0%	50%
Vinnytska	0%	0%	0%	100%
Volynska	0%	39%	6%	56%
Zakarpatska	0%	0%	0%	100%
Zhytomyrska	0%	8%	0%	92%
Donetska*	0%	25%	0%	75%
Khersonska*	0%	44%	11%	44%
Zaporizka*	0%	0%	0%	100%



Picture 1: A non-displaced resident fills her wood stove © IOM/Alisa Kyrpachova 2023

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.

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.

PRIMARY SOLID FUEL MARKETPLACE TYPES:

- 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

