



## Status of implementation of energy units for natural gas metering and settlement

by the Energy Community Secretariat

# PURPOSE STATEMENT

Review of progress on the regulatory framework of Ukraine concerning the natural gas metering units.

## TABLE OF CONTENT

Introduction	1
Background	1
Impact on market and stakeholders in Ukraine	2
Compliance assessment	3
Conclusions and recommendations	4

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## **Ukraine Energy Market Observatory**

### **Assessment 14/24**

#### **Status of implementation of energy units for natural gas metering and settlement**

## Background

Ukraine has undergone significant changes in its energy sector in recent years, particularly transitioning towards more efficient and transparent energy management practices. This includes the development of legislation regarding the conversion of energy units from cubic meters (m<sup>3</sup>) to kilowatts-hours (kWh) for natural gas. This shift reflects efforts to modernize energy measurement and billing systems, enhance energy efficiency, and align with the Energy Community acquis and European standards and practices.

Although the legal framework is in place, due to the Russian war against Ukraine, implementing activities are postponed until the end of martial law.

In practice, the current approach to natural gas metering in m<sup>3</sup> is considered an obstacle for further natural gas market development, in particular, related to gas storage and renewable gases, as well as energy efficiency measures.

The Secretariat recommended<sup>1</sup> introducing energy units in practice as one of the short-term actions to improve natural gas market compliance earlier in 2024.

## Introduction

Since 2017, the Gas Transportation System Code (hereinafter, GTS Code)<sup>2</sup> requires determination of natural gas volumes at the entry-exit points of the gas transportation system in energy units. However, energy units were introduced in addition to measuring in m<sup>3</sup> and are, in most cases, used only for information and not for financial purposes.

On 2 November 2021, the Verkhovna Rada adopted Law No.1850-IX,<sup>3</sup> introducing natural gas metering and accounting in energy units within the natural gas market (hereinafter, Law No. 1850). According to the relevant amendments introduced to the Natural Gas Market Law<sup>4</sup> (Article 18<sup>1</sup>), settlements during natural gas injection/withdrawal and transfer to/from the gas transportation or gas distribution system, purchase, sale, supply, consumption of natural gas, provision of services for transportation, distribution, storage (injection, withdrawal) of natural gas or LNG installation services shall be done in energy units (kWh).

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<sup>1</sup> Ukraine Energy Market Observatory 01/2024

<sup>2</sup> <https://zakon.rada.gov.ua/laws/show/z1378-15#Text>

<sup>3</sup> <https://zakon.rada.gov.ua/laws/show/1850-IX#Text>

<sup>4</sup> <https://zakon.rada.gov.ua/rada/show/329-19/ed20240630#Text>

Determination of the volume of natural gas in energy units shall be carried out in one of the following ways (in order of priority):

- 1) by measuring the volume of natural gas in energy units;
- 2) by converting the volume of natural gas in units of volume (cubic meters) into the volume of natural gas in units of energy (kilowatt-hours), which is determined by the relevant route under the Gas Transportation Code and Gas Distribution Code approved by the Regulator.

Law No. 1850 provides for the transition of calculating gas in kWh instead of cubic meters (m<sup>3</sup>) as of 1 May 2022.

However, in July 2022, the Verkhovna Rada postponed<sup>5</sup> the deadline for the implementation of accounting and settlement of gas volumes in energy units for an indefinite time, namely, to 1 May after the date of termination or lifting of martial law. The reason for the postponement was the Russian invasion of Ukraine and active hostilities, which made it impossible to prepare for the practical implementation of energy units in a timely manner. Additionally, it was argued that the transition to energy unit settlements requires timely information to the public about the new procedure for natural gas metering. The inherent complexity of such information against the background of ongoing hostilities makes it allegedly difficult for consumers to understand the innovations and would worsen payment discipline.

For some transactions with gas products, measuring and accounting in energy units are now obligatory. This is the case for customs control and customs clearance of biomethane moving across the customs border of Ukraine by pipeline transport<sup>6</sup>. Gas volumes at entry-exit points to/from the GTS Code shall also be determined in MWh and m<sup>3</sup>.

## Impact on the markets and stakeholders in Ukraine

At the moment, energy units are implemented at interconnection points. Since Ukraine strives to become an Eastern European gas hub, measuring and accounting unit synchronisation is necessary. The change to energy units will facilitate the integration of the Ukrainian gas market into the European one, establish a reasonable basis for introducing renewable gases into the grid and trade, and solve several identified issues related to gas storage utilization by foreign entities in the Ukrainian underground storage.

The entire gas system of Ukraine – the transmission network including interconnection points with other transmission systems, underground storages, injection of production, and distribution networks – can be considered technically as one gas system, one mass balance system. Thus, in order to ensure consistency, the units used must be harmonized for the entire system. At the moment, energy units are used for communication on the interconnection points, being transit or import. The fully efficient utilization of underground storages by foreign traders requires the introduction of energy units at injection/withdrawal/storage capacities. An equation on the gas system cannot be adequately closed if other entries and exits to and from the transmission system also do not introduce energy units.

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<sup>5</sup> Law of Ukraine No. 2372-IX, <https://zakon.rada.gov.ua/laws/show/2372-IX#Text>

<sup>6</sup> Transitional Provisions of the Law of Ukraine "On alternative fuels" (No. 1391-XIV), <https://zakon.rada.gov.ua/laws/show/1391-14#n155>

During a meeting with Ukraine's stakeholders in March 2024, the shippers' community identified the lack of energy unit implementation as one obstacle to the trade and storage of gas in Ukraine<sup>7</sup>. Some representatives noted that due to the conversion process kWh-->m3-->kWh, the amount of gas they receive back from Ukraine differs from the amount they initially injected.

## Compliance Assessment

The relevant natural gas framework in the Energy Community, in particular Annex I of Regulation (EC) 715/2009 of 13 July 2009 on conditions for access to the natural gas transmission networks and Regulation (EU) 703/2015 of 30 April 2015 establishing a network code on interoperability and data exchange rules<sup>8</sup> (hereinafter, NC on Interoperability and Data Exchange) requires transmission system operators to provide information for entry and exit points in consistent units, in kWh and m<sup>3</sup>, with a constant conversion factor to energy.

Article 13 of NC on Interoperability and Data Exchange Regulation requires each transmission system operator to use a common set of units defined in this Article for any data exchange and data publication. In this context, transmission system operators shall use:

- gross calorific value (GCV): kWh/m<sup>3</sup>
- energy: kWh (based on GCV)
- Wobbe-index: kWh/m<sup>3</sup> (based on GCV)

For pressure, the transmission system operators shall indicate whether it refers to absolute pressure (bar (a)) or gauge pressure (bar (g)). The reference conditions for volume shall be 0 °C and 1,01325 bar(a). For GCV, energy, and Wobbe-index, the default combustion reference temperature shall be 25 °C. Whenever transmission system operators communicate data on the volume, GCV, energy, and Wobbe index, they shall specify under which reference conditions these values were calculated.

Point 3 Annex I of Regulation (EC) 715/2009 defines the technical information necessary for network users to gain effective access to the system, prescribing that transmission system operators shall provide information in consistent units, in kWh (with a combustion reference temperature of 298,15 K, i.e. 25 °C) as the unit for energy content and in m<sup>3</sup> (at 273,15 K i.e. 0 °C and 1,01325 bar) as the unit for volume. A constant conversion factor to energy content will be provided. The transmission system operator should provide information for all relevant points, which at least shall include all entry and exit points to and from a transmission network operated by a transmission system operator except for exit points connected to a single final customer and, respectively, entry points linked directly to a production facility of a single producer. All information must cover all entry and exit points connecting balancing zones and points to the underground storage.

The European standardisation for gas metering in energy units is also promoted by the Energy Efficiency Directive 2012/27/EU<sup>9</sup>, which focuses on enhancing energy efficiency in end-use. Article 9 thereof prescribes that "*final customers for electricity, natural gas, district heating, district cooling, and domestic hot water are provided with competitively priced individual meters that accurately reflect the final customer's actual energy consumption and that provide information on the actual time of use.*" By using kWh to measure actual energy consumption, final customers receive more

<sup>7</sup> <https://www.energy-community.org/dam/jcr:56d0617f-7a99-47be-a5da-e3a5fee06693/Note05.pdf>

<sup>8</sup> Incorporated and adapted by Permanent High Level Group Decision 2018/02/PHLG-EnC of 12 January 2018

<sup>9</sup> Adopted for the Energy Community by the Ministerial Council Decisions 2015/08/MC-EnC, 2021/14/MC-EnC and 2022/02/MC-EnC

precise and comparable information about their energy usage. This helps to better understand and manage energy consumption, leading to potentially significant improvements in energy efficiency.

While energy units have been introduced by Law No. 1850, the implementation of the requirements on natural gas metering and the complete transition to kWh for all levels of the gas market, including final consumers, has not yet been completed.

## Conclusions and Recommendations

Adopting energy units (kWh) as the standard unit for gas measurement in Ukraine is necessary to comply with the Energy Community acquis. Furthermore, by implementing this change, Ukraine will facilitate market integration and increase the attractiveness of Ukrainian underground storage. It will also lay the basis for the acceptance and trade of renewable gases and enhance energy efficiency.

Ukraine should start with a transition period to conclude all necessary preparatory procedures for a complete switch for the entire gas market. This may be reflected in the relevant roadmap designed jointly with the operators, considering their readiness for the transition.

**Technical Adjustments:** Implementing the conversion from m<sup>3</sup> to kWh requires adjustments not only in capacity offering, booking, and matching but also in energy metering and billing systems. This may require investments in upgrading infrastructure if and where it is absolutely necessary (metering units, chromatographs, technical and commercial personnel training).

**Consumer & Stakeholders Awareness:** Educating consumers and stakeholders about the change in energy units is crucial to ensure understanding, acceptance, and smooth switching. This also should include public awareness campaigns. The primary focus should be placed on informing consumers that they will now see the caloric content of the gas supplied and pay only for the actual energy consumed. Additionally, this facilitates comparisons with other energy carriers, promoting informed decision-making and enhancing overall energy efficiency.

**Regulatory Framework:** Law No.1850 regarding the deadline for introducing energy units requires amendments to allow for a gradual transition to measuring and accounting units synchronized with the EU acquis and standards. Furthermore, adjustments to existing regulatory frameworks and laws may be necessary. Most normative documents have been developed, and political will is needed to adopt them. NEURC shall proceed with adopting drafted amendments to the GTS and GDS Codes regarding the application of energy units in transactions on the gas market. Such amendments may enter into force according to the timeline defined in the roadmap.

The Energy Community Secretariat **recommends** convening a high-level meeting *with the participation of Ukrainian stakeholders, the Secretariat, and the international donor community*. The meeting should build on the outcomes of discussions with market participants and seek a suitable timeline for transitioning to kWh metering shortly, independent of the duration of martial law.