Inventory of Energy Subsidies in the EU's Eastern Partnership Countries

Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine

POLICY HIGHLIGHTS

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Key highlights

- This study is the first comprehensive and consistent record of energy subsidies in the European Union's (EU) Eastern Partnership (EaP) countries, Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine. It covers the period 2010 – 2015.

- While the energy systems in the EaP countries have undergone significant reforms and restructuring, energy subsidies continue to play an important role in their energy policies. All EaP countries support fossil-fuel production and consumption and subsidies come in many different forms.

- In **absolute terms**:

  – The amount of government support that goes to fossil fuels in Ukraine was reduced from about USD 17 billion in 2014 (about 13% of the country's GDP) to about USD 7 billion in 2015. This significant decrease was a result of a number of reforms that the government of Ukraine has put in place over the past years, starting in 2015.

  – Fossil-fuel subsidies in Belarus have steadily increased since 2010, reaching USD 1.6 billion in 2014. Azerbaijan had a similar level of subsidies in 2014, estimated at USD 1.7 billion.

  – Energy subsidies in Georgia and Moldova were much smaller but increased over the review period to the levels of USD 228 and 182 million, respectively.

  – The annual amount of subsidies in Armenia was significantly lower than in the other five countries and fluctuated between USD 37 and 42 million in 2010 - 2015.

- In **relative terms** as a share of GDP in 2014 the quantified fossil-fuel subsidies in Azerbaijan, Moldova and Ukraine were larger than the general government deficit in these countries. This points to the possibility to further streamline these subsidies and raise additional revenue for the government which can be redistributed more efficiently and to better social causes.

- Most of the **fossil-fuel subsidies aim to benefit residential consumers**. Regulated energy prices set at below-market rates that benefit consumers are the most important form of subsidisation in the EaP region. Cross-subsidisation between commercial users and households or between energy producers and consumers still exists in Belarus, Georgia and Ukraine. Often, such subsidies are seen as social measures by the governments and the population.

- The **bulk of subsidies** goes to natural gas which is not surprising, given that natural gas dominates the energy mix in these countries and is used in generating heat and electricity.

- The natural gas, electricity and heat sectors remain subject to **price regulation** in the EaP countries for consumers and often for energy producers. **Low energy prices** translate into low tariffs which are a major obstacle to investments by gas and heat network companies. Low tariffs make renewable energy more expensive, and do not incentivise energy efficiency measures.

- Government support to **energy efficiency** and **renewables** in the EaP region is **negligible** compared to support that goes to the production and consumption of fossil fuels.

- The most deregulated energy segment is the market of **liquid petroleum products**. Energy pricing policies, including pricing methodologies, tariff structures and regulatory procedures have continued to evolve. The tax system has been rationalised and simplified which has led to increased tax collection.

Introduction

Energy and carbon intensities of the EaP economies remain high, which represents significant potential for increasing energy efficiency (EE) and renewable energy (RE) as well as reducing air pollutants and greenhouse gas (GHG) emissions.

Table 1. **KEY ECONOMIC INDICATORS OF THE EaP COUNTRIES IN 2015**

	Population, million	GDP growth rate	GDP, billion current USD	GDP per capita, purchasing power parity (PPP) (current international USD)	CO_2 emissions per capita, tonne of CO_2, 2014
Armenia	3	3.0%	10.5	8 418.7	1.74
Azerbaijan	9.7	1.1%	53.0	17 776.1	3.23
Belarus	9.5	-3.9%	54.6	17 696.9	6.06
Georgia	3.7	2.8%	14.0	9 698.9	1.71
Moldova	3.6	-0.5%	6.6	5 048.9	2.04
Ukraine	45.2	-9.9%	90.6	79 39.6	5.21

Source: World Bank Open Data, http://data.worldbank.org.

Figure 1. **ENERGY PRODUCTIVITY IN THE EaP COUNTRIES**

GDP per unit of energy use, constant 2011 PPP USD per kilogramme of oil equivalent

Source: World Bank Open Data, http://data.worldbank.org
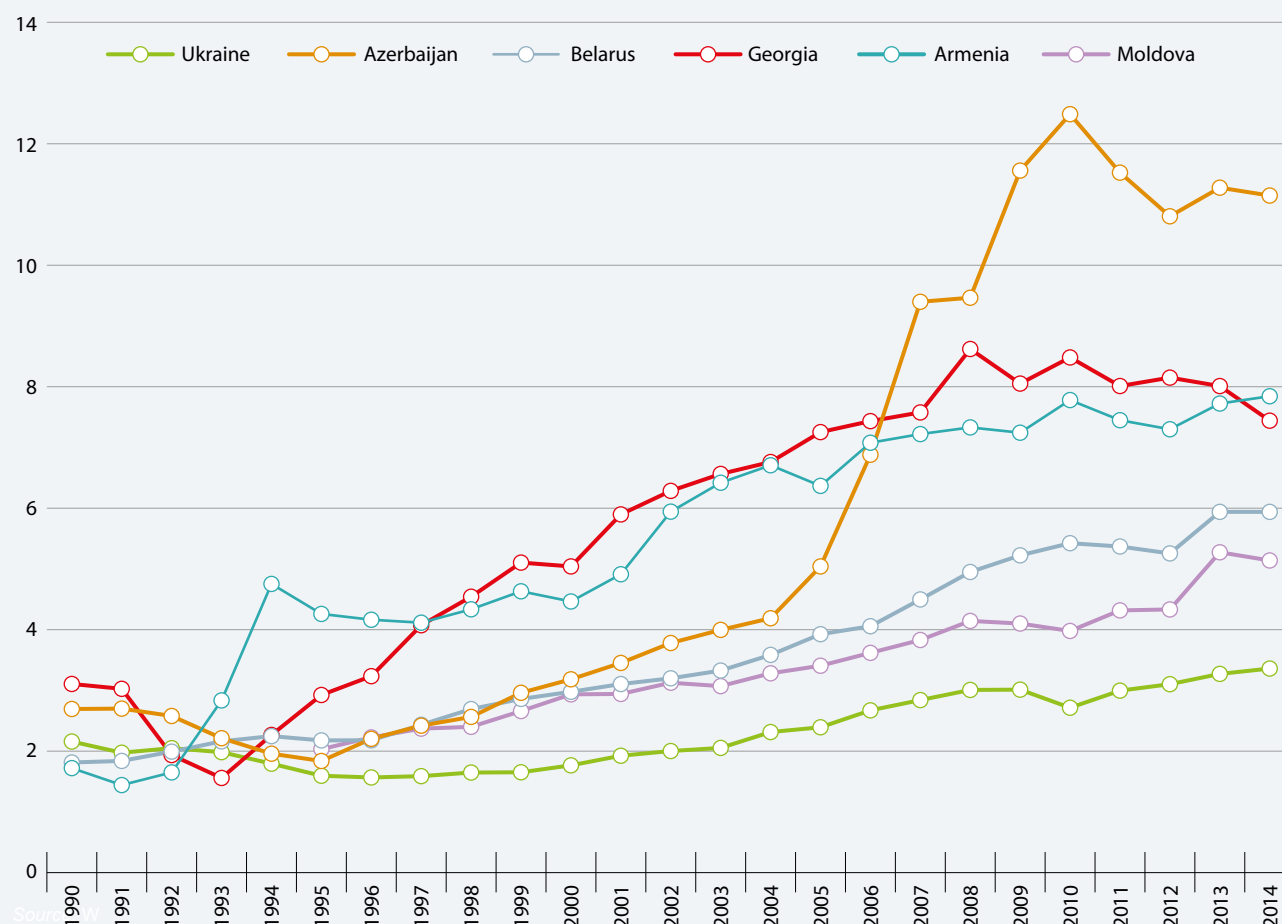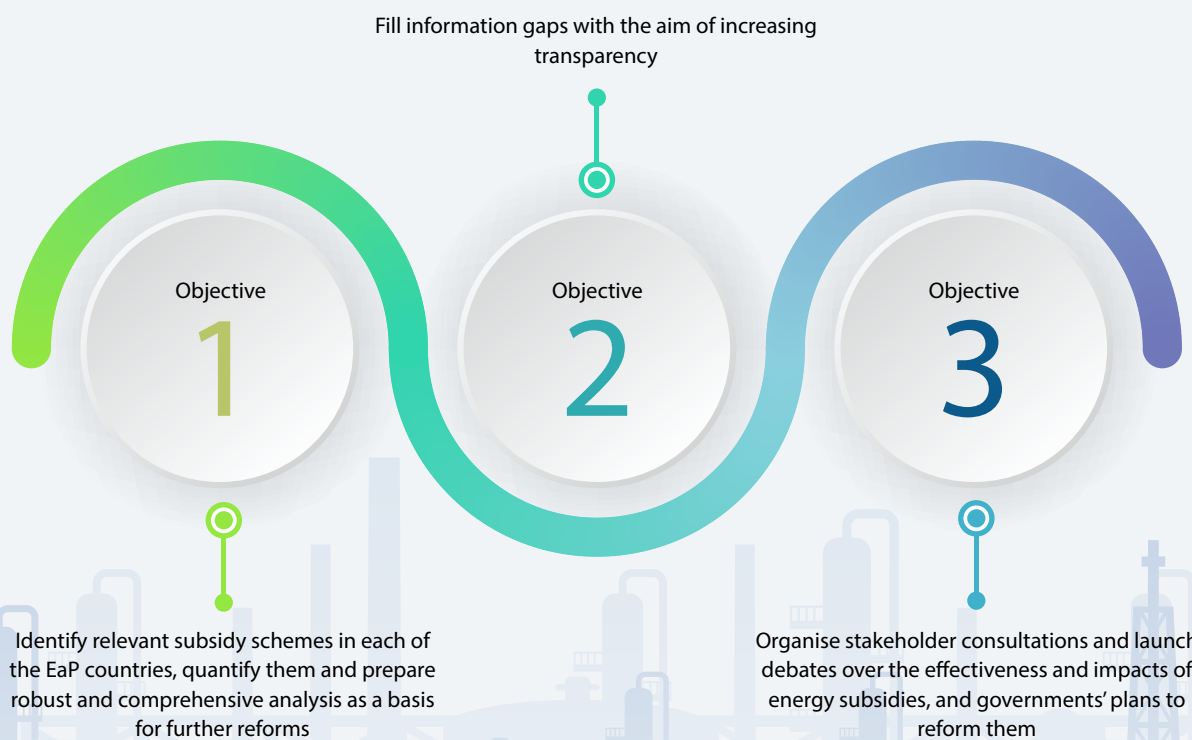
Objectives of the study

As in many other countries, governments in the region have long relied on energy subsidies to advance specific development goals or address market failures. The most common argument for introducing and maintaining energy subsidies is that they support important domestic policy objectives, such as rural and industrial development, job creation, improved energy access, energy security, and poverty alleviation.

However, the economic cost of energy subsidies can represent a significant burden on a country's finances, weaken its growth potential and encourage wasteful energy consumption. Analysis shows that energy subsidies tend to accrue not to those with the lowest income, but rather to the largest and most economically powerful recipients, thus increasing profits for well-connected investors or industries. Subsidies to energy consumption and production distort costs and prices and lead to inefficiencies in the economy. By encouraging use of fossil fuels and discouraging production of low-carbon fuels, such subsidies undermine the development and commercialisation of renewable energy and other low-carbon technologies and can lead to increased GHG emissions.

This study is the first comprehensive and consistent record of energy subsidies in the EaP region. It was prepared with a view to improving transparency, helping governments in the EaP countries to better understand existing energy-subsidy schemes and their economic, social and environmental impact. The study establishes a solid analytical basis that can help build the case for further energy subsidy reforms in the EaP region.

Figure 2. **MAIN OBJECTIVES**

Fill information gaps with the aim of increasing transparency

Objective **1**

Objective **2**

Objective **3**

Identify relevant subsidy schemes in each of the EaP countries, quantify them and prepare robust and comprehensive analysis as a basis for further reforms

Organise stakeholder consultations and launch debates over the effectiveness and impacts of energy subsidies, and governments' plans to reform them

Scope of the study

The inventory of government support schemes in the energy sector in the EaP countries covers the period 2010 – 2015. Where other years are included these are clearly identified.

The analysis presented in this study:

- **covers subsidies to consumers and to producers of coal, oil and petroleum products (particularly in the transport sector), natural gas, as well as electricity and heat generated on the basis of these fossil fuels;**

- **reviews subsidies to energy efficiency and renewable energy sources;**

- **does not analyse support to nuclear energy.**

The analysis makes use of the OECD methodology for quantifying government support to fossil-fuel consumption and production. Over the years, the OECD has done extensive work on analysing government support measures in both OECD countries and key emerging G20 economies (Brazil, China, India, Indonesia, the Russian Federation, South Africa).
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Government support for fossil-fuel production and consumption in the EaP countries

Estimates show that Ukraine is the country where fossil-fuel subsidies were the largest. About USD 17 billion was provided in 2014 though the amount was significantly reduced in 2015 as part of Ukraine's subsidy reform. Fossil-fuel subsidies in Belarus steadily increased since 2010, reaching USD 1.6 billion in 2014. Azerbaijan had a similar level of subsidies in 2014, estimated at USD 1.7 billion. Energy subsidies in Georgia and Moldova were much smaller but increased over the review period to the levels of USD 228 million and 182 million, respectively. The annual amount of subsidies in Armenia was significantly lower than in the other five countries and fluctuated between USD 37 million and 42 million during the review period.

These findings provide an additional insight to the analysis carried out by the International Energy Agency (IEA) which estimated subsidies to consumers of fossil fuels in 2014 in Azerbaijan at USD 1.5 billion (equivalent to 2% of GDP) and in Ukraine at USD 6.4 billion (4.9% of GDP) (IEA-OECD database). The IEA estimates include subsidies to gas, oil, coal and electricity, but exclude subsidies to heat. The IEA has not identified and quantified fossil-fuel subsidies in other EaP countries.

A comparison of quantified fossil-fuel subsidies and national budget deficit as a share of GDP gives yet another insight. In 2014, the latest year for which estimates were available for all countries, fossil-fuel subsidies reached 12.8% of GDP in Ukraine while equalling 2.1%-2.3% in Belarus, Azerbaijan and Moldova and 1.4% in Georgia. In Azerbaijan, Moldova and Ukraine, fossil-fuel subsidies were larger than the national budget deficits. In Armenia, the subsidies accounted for a much smaller share of GDP (0.4%) as compared to the budget deficit (1.9%).

Natural gas is the most subsidised fossil fuel in the region and so are heat and electricity. This is not surprising given that natural gas dominates the energy mix and is a staple feedstock for electricity and heat generation in the EaP countries. Prices for petroleum products are regulated only in Belarus and Azerbaijan. During the review period, coal subsidies were significant only in Ukraine.

Table 2. **QUANTIFIED FOSSIL-FUEL SUBSIDIES IN THE EaP COUNTRIES, 2010–15, USD million**

	2010	2011	2012	2013	2014	2015
Armenia	n.c.	37	41	42	42	37
Azerbaijan	n.c	n.c.	n.c.	n.c.	1 700	1 700
Belarus	1 039	1 117	1 469	1 384	1 562	n.c.
Georgia	122	218	233	205	228	n.c.
Moldova	n.c.	141	175	165	182	48
Ukraine	n.c.	n.c.	15 626	14 379	17 064	7 041

Notes: It was not possible to quantify all subsidies that were identified in all EaP countries in each year due to challenges with data availability.
These estimates are affected by data availability for different years, currency exchange rates and international fuel prices underlying price-gap estimates. n.c. – not calculated.
Source: OECD (2018b).

Figure 3. **GENERAL GOVERNMENT DEFICIT AND QUANTIFIED FOSSIL-FUEL SUBSIDIES AS SHARE OF GDP IN 2014**
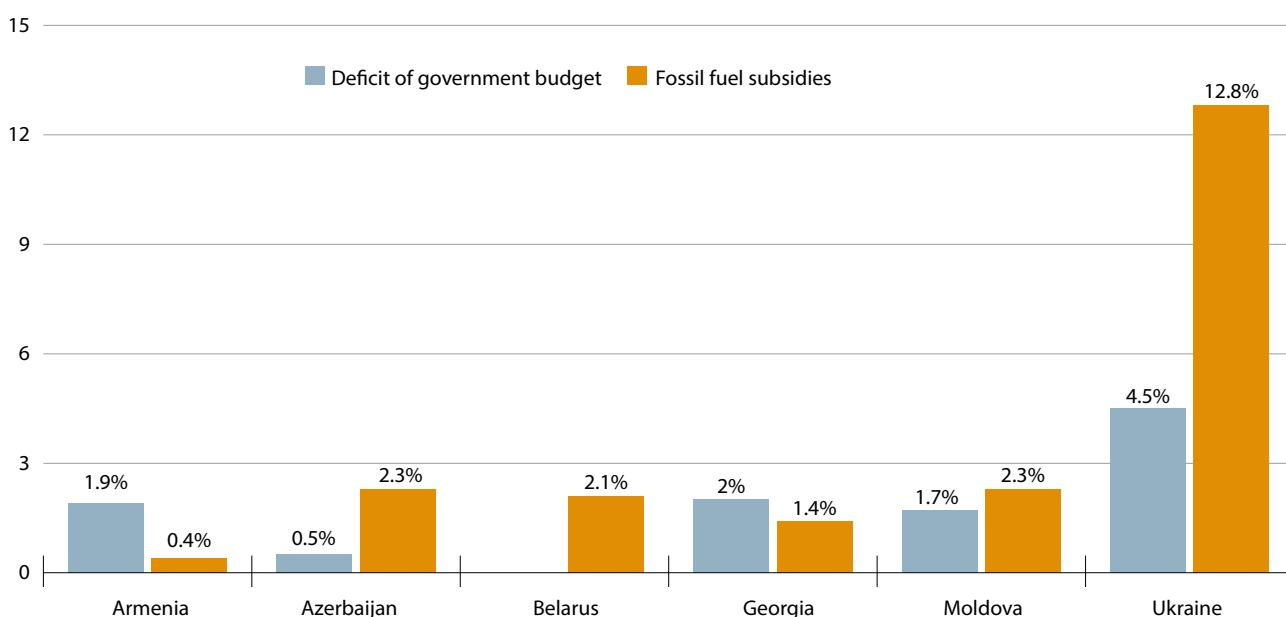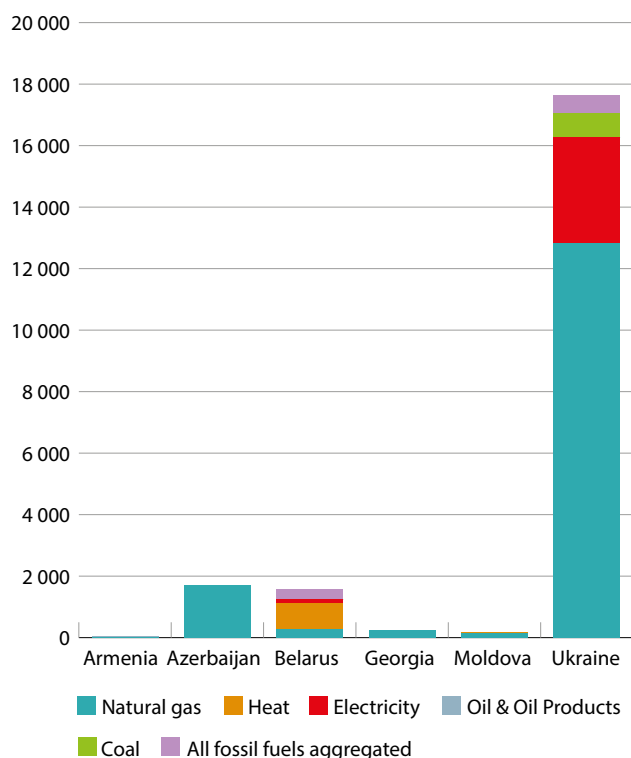

Source: OECD (2018b).

Figure 4 breaks down the 2014 values of the quantified fossil-fuel subsidies by fuel in the EaP countries.

Among the region's fossil-fuel subsidies that are more opaque and remained unquantified are various tax breaks for fossil-fuel producers, including within Production Sharing Agreements and Host Government Agreements that govern taxation of large international projects of natural gas and oil extraction and pipeline transportation in Azerbaijan and Georgia.

Figure 4. **QUANTIFIED FOSSIL-FUEL SUBSIDIES IN THE EaP COUNTRIES BY FUEL IN 2014, million USD**

Source: OECD (2018b).

Box 1. **REGULATED ENERGY PRICES AND CROSS SUBSIDIES**

Taking account of mechanisms and beneficiaries, **regulated energy prices** that are set at below-market rates and benefit consumers are by far the **most significant form of subsidisation** in the EaP countries. Cross-subsidies for both energy producers and consumers are another widespread mechanism. In Georgia, for instance, electricity producers sell electricity to the grid at differentiated tariffs that ensure lower costs to end consumers, but in practice provide cross-subsidies from cheap hydropower generation to higher-cost natural gas generation. Another example is Belarus, where commercial consumers of natural gas, electricity and heat pay a premium in the tariff put in place to cross-subsidise the tariff for households. Furthermore, heat tariff for households is cross-subsidised not just through the higher heat tariffs for commercial users, but also through tariff for electricity, since Belarus co-generates a lot of its heat and electricity. Quantification of such cross-subsidies presents a methodological challenge, however the obtained estimates provide enough evidence to suggest that cross-subsidies add another level of complexity in distorting the level-playing field for competing energy sources in the EaP region.

Source: OECD (2018b).

Government support for energy efficiency and renewable energy measures

The EaP countries' governments provide also support to energy efficiency and renewables but on a much smaller scale than subsidies to fossil fuels. Only Belarus and Ukraine provide sizeable quantifiable support to energy efficiency and renewable energy, in the range of USD 285-364 million, respectively, in 2014. This includes national energy-efficiency programmes and feed-in tariffs for renewables. For renewable energy, the insignificant value of government support is partly explained by the so far limited uptake in biomass, wind and solar. Hydropower, including small hydropower, remains the main renewable energy source in the Caucasus, where it is viewed mainly as a low-cost option that can cross-subsidise thermal power plants rather than as a cleaner energy source to be proactively promoted with subsidies.
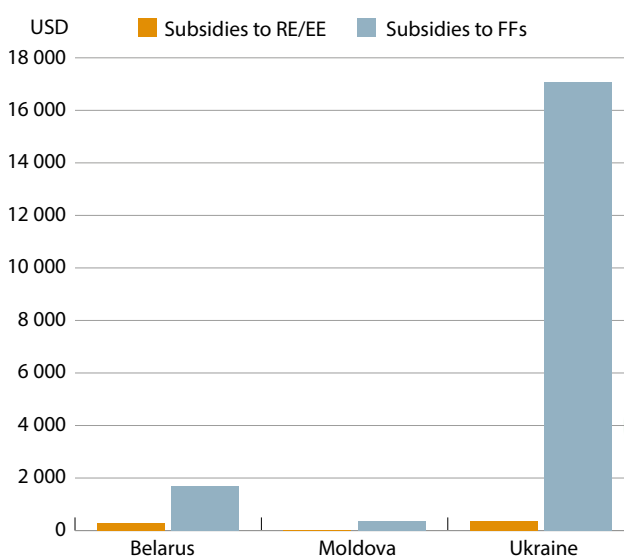
Table 3. **ENERGY-EFFICIENCY AND RENEWABLE ENERGY SUBSIDIES IN THE EaP COUNTRIES, million USD**

	2011	2012	2013	2014	2015	Major subsidy schemes
Armenia			No quantified subsidies			Purchase guarantees and feed-in tariff for renewables
Azerbaijan			No quantified subsidies			Value-added tax (VAT) and customs duty exemption for energy-efficiency and renewable energy projects, differentiated tariff for hydro and wind
Belarus	259	364	358	285	n.c.	National Programme on Energy Efficiency, feed-in tariff and tax breaks for renewables
Georgia			No quantified subsidies			Feed-in tariffs and tax breaks for hydropower
Moldova	n.c.	n.c.	0.14	0.8	0.39	Feed-in tariff for renewables
Ukraine	n.c.	441	802	364	294	State Targeted Programme on Energy Efficiency, feed-in tariff for renewables, zero excise tax rate for bioethanol. Other tax breaks for renewables were discontinued in 2015

Note: n.c.: not calculated.

Source: OECD (2018b).

Figure 5. **FOSSIL-FUEL SUBSIDIES VS EE/RE SUBSIDIES IN BELARUS, MOLDOVA AND UKRAINE, 2014, million USD**

Source: OECD (2018b).

The implementation of energy-efficiency and renewable energy projects in the region depends to a large extent on international co-operation, in particular financing from multilateral development banks. The World Bank, the European Bank for Reconstruction and Development, KfW, and the Asian Development Bank remain critical players in this area.

# Ongoing energy subsidy reforms in the EaP countries

The EaP countries are constantly designing and implementing energy pricing reforms, even though they are not always framed and discussed as reforms of energy subsidies.

All EaP countries continued pricing reforms throughout 2016-2017, and thus 2014 and 2015 subsidy estimates do not precisely describe the most recent situation in the EaP countries that keeps evolving. For instance, Belarus cancelled its value-added tax (VAT) exemption for heat, electricity and natural gas for households starting in January 2016, ending a subsidy worth USD 200 million per year. Armenia eliminated its excise tax exemption for compressed natural gas (CNG) in May 2016, worth around USD 9 million per year.

Due to the military conflict in eastern Ukraine, coal subsidies were *de facto* discontinued. In April 2016 the Ukrainian government decided to increase natural gas tariffs towards cost-recovery levels. This has helped to significantly reduce the level of Ukraine's fossil-fuel subsidies, which also helped to reduce the budget deficit. At the same time, generated savings were partially rechannelled to targeted subsidies for low-income groups and the energy-efficiency programme in the residential sector.

Figure 6. **UKRAINE: TARGET SUPPORT PROGRAMME FOR LOW-INCOME HOUSEHOLDS, billion UAH**

- To purchase solid and liquid furnace fuel and LPG
- To partially cover utility costs
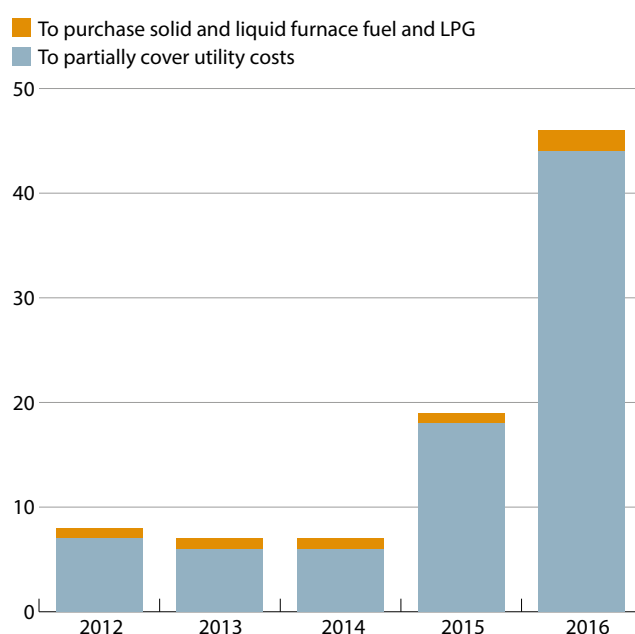
Source: Based on Ukraine's Treasury reports on budget execution (2012-2016).

Figure 7. **UKRAINE: STATE SUPPORT TO RENEWABLES AND ENERGY EFFICIENCY IN UKRAINE, billion UAH**

- Energy efficiency programme
- Tax benefits for renewables
- Feed-in tariff for renewables*
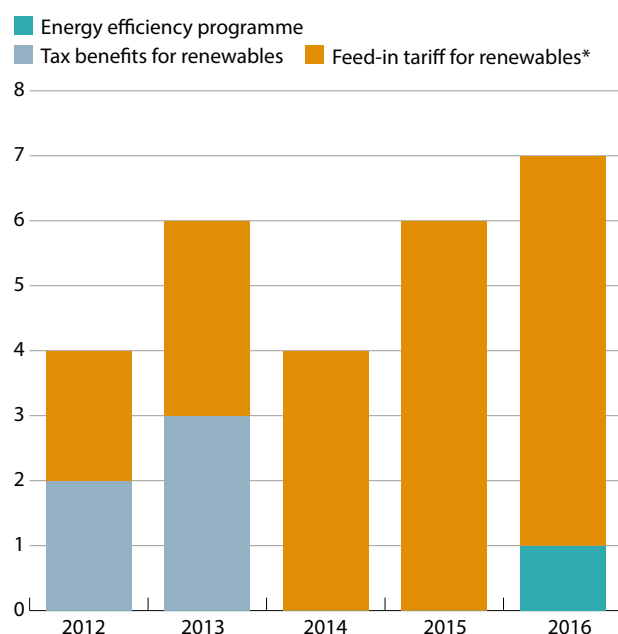
Source: Based on Ukraine's Treasury reports on budget execution (2012-2016), National Commission for State Regulation of Energy and Public Utilities and Ministry of Finance data.

Methodology of subsidy analysis

If governments intend to rationalise their energy subsidy schemes and implement politically challenging subsidy reforms, they need a good understanding of what these schemes are, how much they cost the public purse and the extent of their economic, social and environmental impacts. A variety of methods and tools to identify and measure the nature and impacts of subsidies have been designed and applied by different institutions. These methods serve different purposes and vary in their level of detail and analysis.

Figure 8. **THREE-STAGE PROCESS OF ANALYSING SUBSIDY SCHEMES**

| 1 Identification | 2 Measurement | 3 Quantification of effects and evaluation |

A comprehensive approach to analysing subsidy schemes consists of three major consecutive steps, from identifying to measuring a subsidy to quantifying and evaluating its economic, social and environmental impacts. While this process is logical, its practical implementation is neither easy nor straightforward and requires significant research and data collection efforts. Such data are not always readily available in the public domain.

1. Subsidy definition and identification

The original – simplest and narrowest – definition of a subsidy is a **direct budgetary payment** by a government to a producer or consumer under the form of a grant, loan or loan guarantee (a type of potential liability for the budget). More recently, **tax expenditure** (special deviations from standard tax rules under the form of tax deductions or reductions granted to selected groups or specific activities) were added to the definition of subsidy. Other government **revenue foregone** due to under or non-collection (e.g. non-payment of tariffs) forms part of this definition of a subsidy as well. Today, in the OECD countries, tax expenditures are considered a more significant source of public support than direct budgetary support.

Governments can provide support directly (through budgetary transfers and tax expenditures) or indirectly, through market interventions (that is, policies that affect the prices of certain goods and services) which are also known as **induced transfers**. These can include, among others, import tariffs, regulated below-market electricity/heat prices, cross-subsidies in the electricity sector.

Box 2. **SHIFTING THE ALLOCATION OF RISKS OR ECONOMIC REWARDS AS A FORM OF SUBSIDY**

One of the most common misconceptions about subsidies is that they are simply cash. In fact, a great deal of market activity involves controlling and sharing the risks and rewards of economic activity. While bearing less risk or obtaining a larger share of the rewards can greatly improve economic returns to a private company, the subsidies themselves may take the form of shifting the allocation of risks or rewards rather than providing direct payments to industries.

In contrast to direct payments, the public rarely learns about or recognise some of these "other" support benefits. Many of these mechanisms tend to be hidden in legislation. When they do come to the public's attention, they are usually cloaked in socially benign language that makes them more readily acceptable.

Source: OECD (2013), Earth Track, Inc. (www.earthtrack.net).

Given that subsidies exist in a variety of forms, the OECD favours using the broader concept of support rather than subsidies as such. Support measures, analysed in the OECD *Inventory of Support Measures for Fossil Fuels*, include direct budgetary expenditure and tax expenditure that in some way provide a benefit or advantage to fossil-fuel production or consumption relative to alternatives. This report uses the terms "subsidies" and "government support" interchangeably.

While environmental externalities (such as pollution or habitat damage) whose costs are not borne by industry may constitute subsidies to the latter, many studies choose not to analyse them, as the uncertainty regarding their value is higher than in the case of most direct subsidies. Hence, analysts often leave them out to focus on the many ways in which direct government subsidies help polluting activities by industries.

For energy subsidy identification purposes, this study relies on the most widely recognised and legally-binding definition of a subsidy, formulated in the Agreement on Subsidies and Countervailing Measures (ASCM) of the World Trade Organization. The ASCM has been signed by 164 countries, including Armenia, Georgia, Moldova and Ukraine (Azerbaijan and Belarus are at different stages of joining the WTO).

The ASCM determines that for all types of economic activities, four types of subsidies exist, where:

1. Government provides direct transfer of funds or potential direct transfer of funds or liabilities;

2. Government revenue is foregone or not collected;

3. Government provides goods or services or purchases goods on terms that confer a benefit compared to market terms;

4. Government provides income or price support.

The ASCM further stipulates that in order to be considered a subsidy, the benefit has to be specific to the company or industry. The "specificity" criterion is important for screening policies and identifying them as subsidies.

The subsidy definition is closely linked to the concept of subsidy classification. Different typologies of subsidies can be distinguished. The most commonly used approach distinguishes subsidies that benefit consumers from those benefitting producers of energy. Another straightforward approach breaks down subsidies by fuel. For example, the IEA provides subsidy estimates for oil, natural gas, coal and electricity, although it does not have such estimates for heat.

This study follows the OECD classification, grouping subsidies in 4 main categories (OECD, 2013) which include: direct transfers of funds from the budget to energy producers and consumers, tax expenditure and other government revenue foregone, induced transfers and transfer of risk to government.

Table 4. **OECD MATRIX OF FOSSIL-FUEL SUPPORT MEASURES, WITH EXAMPLES**

TRANSFER MECHANISM (how a transfer is created)	STATUTORY OR FORMAL INCIDENCE (to whom and for what a transfer is given)								
	Production							Direct consumption	
					Cost of production factors				
	Output returns	Enterprise income	Cost of intermediate inputs	Labour	Land	Capital	Knowledge	Unit cost of consumption	Household or enterprise income
Direct transfer of funds	Output bounty or deficiency payment	Operating grant	Input-price subsidy	Wage subsidy	Capital grant linked to acquisition of land	Capital grant linked to capital	Government R&D	Unit subsidy	Government subsidized life-line electricity rate
Tax revenue foregone	Production tax credit	Reduced rate of income tax	Reduction in excise tax on output	Reduction in social charges (payroll taxes)	Property tax reduction or exemption	Investment tax credit	Tax credit for private R&D	VAT or excise-tax concession on fuel	Tax deduction related to energy purchases that exceed given share of income
Other government revenue foregone	Reduced resource-rent tax		Underpricing of a good, government service or access to a natural resource		Underpricing of access to government land; reduced royalty payment		Government transfer of intellectual property right (IPR)	Underpricing of access to a natural resource harvested by final consumer	
Transfer of risk to government	Government buffer stock	Third party liability limit for producers	Provision of security (e.g. military protection of supply lines)	Assumption of occupational health and accident liabilities	Credit guarantee linked to acquisition of land	Credit guarantee linked to capital		Price-triggered subsidy	Means-tested cold-weather grant
Induced transfers	Import tariff or export subsidy	Monopoly concession	Monopsony concession; export restriction	Wage control	Land-use control	Credit control (sector specific)	Deviations from standard IPR rules	Regulated price; cross subsidy	Mandated life-line electricity rate

National subsidy definitions in the EaP countries

Taking into account international concepts, all EaP countries have developed and put in place their own national legal and conceptual frameworks for energy pricing and taxation. These national contexts determine how the term "subsidy" is formally defined and understood in each country.

Regardless of the legislated definition or its absence, the use of the term "subsidy" and its synonyms can be quite loose in documents released by governments and other stakeholders. Subsidies are often narrowly understood as budgetary transfers that are unrequited and irrevocable. Meanwhile, without defining the terms in the legislation, officials can also make use of subsidy-related notions that are translations of equivalents of international terms such as government revenues foregone, budget revenue shortfall, tax expenditures.

As the EaP countries harmonise their legislation with that of the European Union, a related term – "state aid" or "state support" – can also be applied to some of the types of subsidy. It is interesting to note that while direct budget transfers are commonly understood as subsidies in every country, induced transfers that result from regulated prices and tariffs are not legally defined as government support in the EaP countries.

Table 5. **WHAT DO EaP COUNTRIES INCLUDE IN THE NATIONAL DEFINITION OF SUBSIDIES?**

Legend:
- ■ Covered by the national definition of both "subsidy" and "state support"
- ■ Covered only by the national definition of "state support"
- ■ Not covered by the national definitions of either "subsidy" or "state support"

EaP country	Direct budget transfers	Tax revenue foregone	Induced transfers (regulated prices)	Transfer of risk to government
Armenia	both	not covered	not covered	not covered
Azerbaijan	both	both	not covered	not covered
Belarus	both	state support	not covered	not covered
Georgia	state support	state support	not covered	both
Moldova	both	not covered	not covered	not covered
Ukraine	both	state support	not covered	not covered

Source: OECD (2018b).

Approaches to subsidy measurement

There are two main approaches for quantifying subsidies: top-down estimates based on price-gap assumptions, and bottom-up inventories that consider each government support measure individually. Both were used in this study. Each approach has its strengths and limitations, and the two can complement each other. This complementarity is especially useful when access to data and subsidy reporting is restricted.

PRICE-GAP APPROACH

Using the price-gap approach is useful to make comparisons possible across countries where the main form of support is delivered through administrative pricing or export restrictions, but it does have some limitations. For example, some governments of net energy-exporting countries assert that the opportunity cost of exporting fuels to the world market cannot be used as a reference price, and that if domestic prices cover production costs, there is no subsidy. If applied at the level of the entire market rather than individual groups of consumers, the price-gap approach can fail to capture the value of possible cross-subsidies between, for example, industry and households.

Box 3. QUANTIFYING A SUBSIDY USING THE PRICE-GAP APPROACH

The price-gap approach is the default method for subsidy quantification for both the IEA and the International Monetary Fund (IMF). This method estimates the gap between domestic energy prices and reference prices. If the domestic price is lower, a consumption subsidy is deemed to exist. For **net importers** of fossil fuels, the IEA and the IMF base reference prices of fossil fuels on the import parity price: the price of a product at the nearest international hub, adjusted for fuel quality differences if necessary, plus the cost of freight and insurance to the net importer, plus the cost of internal distribution and marketing and any value-added tax. Other taxes, including excise duties, are not included in the reference price. For **net exporters** of fossil fuels, reference prices are based on the export parity price: the price of a product at the nearest international hub, adjusted for quality differences if necessary, minus the cost of freight and insurance back to the net exporter, plus the cost of internal distribution and marketing and any value added tax. For energy exporters, the quantified subsidy represents the opportunity cost of selling fuels at below-market prices domestically, rather than a measure of direct expenditure. The calculation of reference prices for electricity is based on the cost of production, transmission and distribution of electricity in individual countries.

Price gap = Reference price – End-User Price
Subsidy = Price gap × Units consumed

Source: OECD (2018b).

Figure 9. **EXAMPLE OF QUANTIFYING FOSSIL-FUEL CONSUMPTION SUBSIDIES USING THE PRICE-GAP APPROACH**
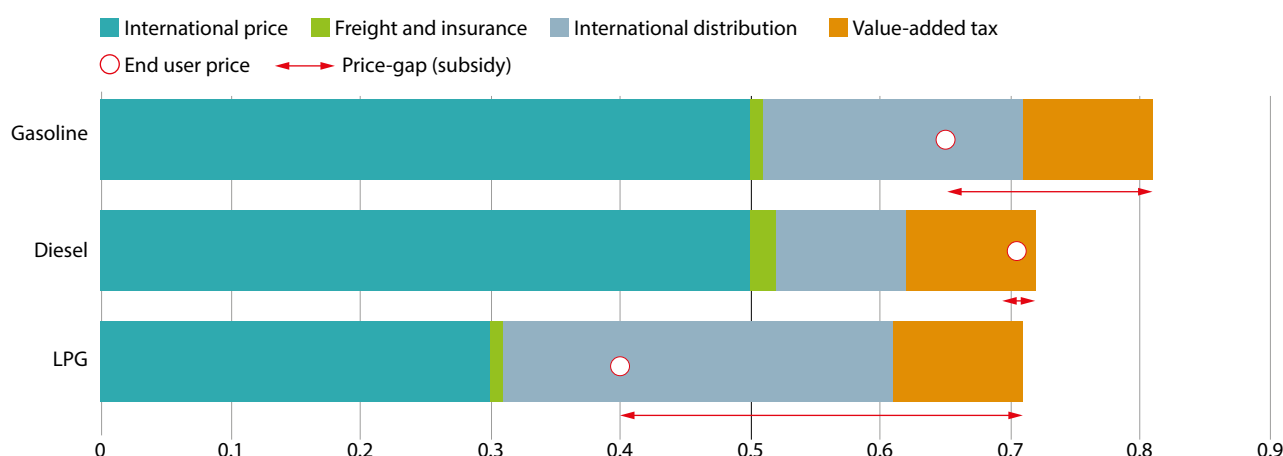
This study uses the price-gap approach for estimating the subsidy to natural gas consumption in each of the EaP countries, as well as for quantifying the value of a number of individual subsidies, especially fossil-fuel subsidies in Azerbaijan and Belarus, as well as subsidies to renewables conferred via feed-in tariffs in several EaP countries.

PRICE-GAP APPROACH APPLIED TO ESTIMATING NATURAL GAS SUBSIDIES IN THE EAP COUNTRIES

In view of the importance of natural gas subsidies in the region, a price-gap analysis was undertaken of natural gas subsidies in all EaP countries in 2015 in order to triangulate bottom-up inventory findings. This exercise follows the logic of IEA estimates of fossil-fuel subsidies and enables a direct comparison across the EaP countries. In particular, IEA estimates subsidies to gas at the level of USD 0.7 billion and USD 3.7 billion in Azerbaijan and Ukraine, respectively.

The results of the price-gap estimates for natural gas point in the same direction as those of the IEA which show significant natural gas subsidies in both Azerbaijan (USD 1.7 billion) and Ukraine (USD 3.1 billion). On balance, the price-gap method does not reveal natural gas subsidies in Armenia, Belarus, Georgia and Moldova. But in the case of Belarus and Georgia below-market prices for natural gas supplied to households are covered by cross-subsidies from commercial users.

The price-gap method compares end-use prices paid by consumers with reference prices that correspond to the full cost of supply: a subsidy is present if the end-use price falls short of the reference price.
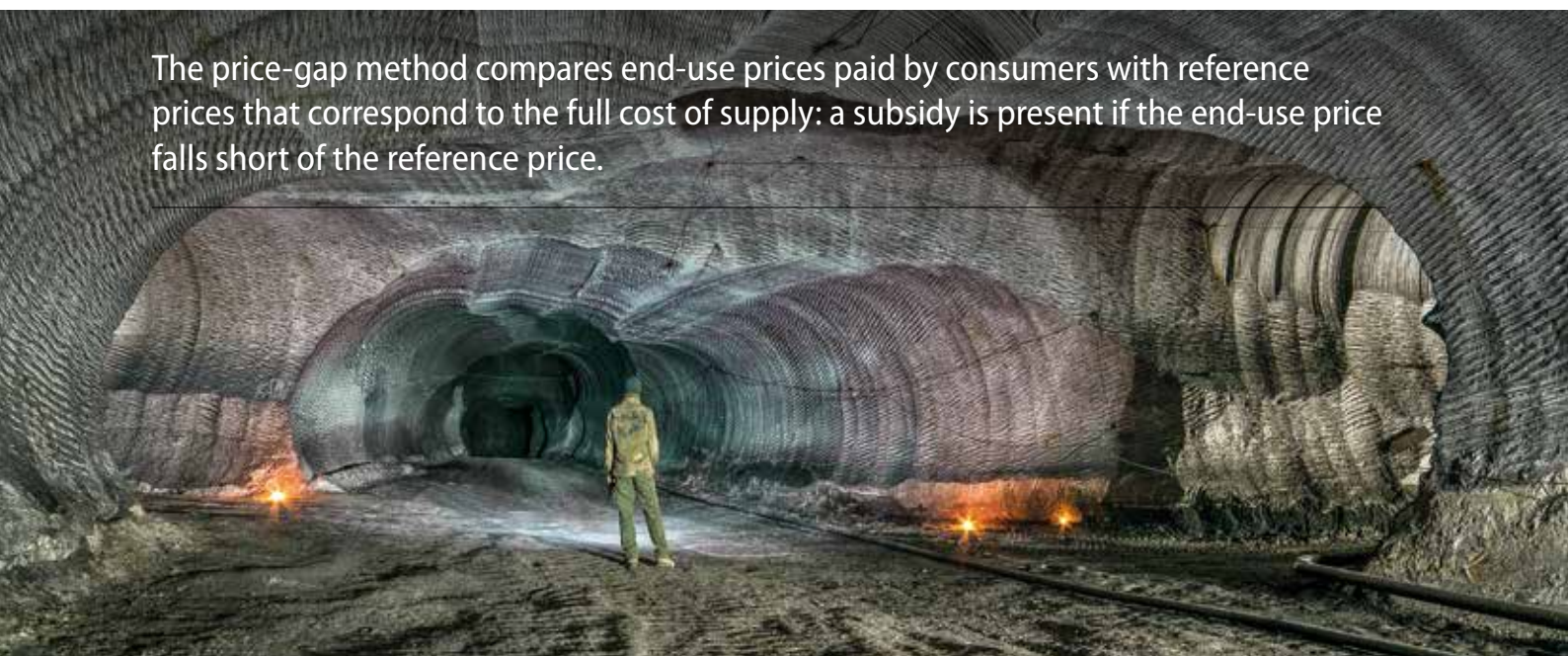
Table 6. **PRICE-GAP ESTIMATES OF SUBSIDIES TO NATURAL GAS CONSUMERS IN THE EaP COUNTRIES IN 2015**

	Price-gap estimate, total, USD million	Reference price, USD per 1 000 m³ (incl. VAT, but excl. transportation and distribution costs)	Value-added tax (VAT) exemptions	Weighted average domestic price (incl. VAT, adjusted for VAT exemptions if any)	Notes
Armenia	-204 (no subsidy)	198 (import cost USD 165 +20% VAT)	none	295	All natural gas imported from Russia. Differentiated tariff for different categories of users.
Azerbaijan[a]	1 700 (subsidy)	267 (opportunity cost of export USD 226 + 18% VAT)	none	120	All natural gas produced domestically. Opportunity cost of export to the European market.
Belarus	-593 (no subsidy)	209 (import cost USD 174.4 + 20% VAT)	for households, eliminated from 1 January 2016	238	All natural gas imported from Russia. Cross-subsidies to households through above-market tariff for commercial users.
Georgia	-64 (no subsidy)	191 (import cost USD 162 +18% VAT)	VAT exemption for Thermal power plants	236	Natural gas imported from Azerbaijan and Russia. Cross-subsidies to Thermal power plants and households through above-market tariff for commercial users.
Moldova	-22 (no subsidy)	307 (import cost USD 256 + 20% VAT)	reduced VAT rate for households (8% instead of 20%)	386	All natural gas imported from Russia. Differentiated tariff for different categories of users.
Ukraine	3 137 (subsidy)	332 (import cost USD 277 + 20% VAT)	none	195-201	Some natural gas produced domestically, the rest imported. Cost of natural gas import according to Naftogaz. Range due to a possible data discrepancy on the tariff for industry.

Notes: All estimates for 2015, except for Azerbaijan, for which the year is 2014.

a. The cost of insurance, freight, transportation and distribution to end users were not available for all countries, and thus are excluded from the reference prices in this table. Therefore, the obtained price-gap estimates of subsidies to natural gas consumers are on the low side. More detail is available in price-gap tables of the individual country chapters, but some of the country chapters also have simplified calculations net of VAT, which is accounted for in this summary table.

Source: OECD (2018b).

INVENTORY APPROACH

The inventory approach is a bottom-up method for subsidy quantification. This approach involves constructing an inventory of policies supporting the production and consumption of energy, quantifying the value of support under each of them, and then aggregating the numbers.

The first step in bottom-up subsidy analysis and quantification is filling in a template with key subsidy characteristics. For subsidy quantification in inventories, the most straightforward way is deriving an estimate from the values reported by governments. Such estimates can be found in budget laws and reports on budget execution, tax expenditure budgets, explanatory notes of ministries of finance, and documents of other government agencies.

As with all inventories, analyses of energy support measures are always a mixture of subsidies that have been assigned a monetary value and those that are identified, but not quantified. Thanks to the availability of sufficiently detailed data, the inventory approach was applied in Armenia, Georgia, Moldova and Ukraine.

Table 7. **EXAMPLE OF AN INVENTORY TEMPLATE OF A SUBSIDY MEASURE IN UKRAINE:**
Requirement for state-owned domestic gas producers to sell gas for household needs at regulated tariffs

Subsidy category	Income or price support → Market price support and regulation → Regulated prices set at below-market rates for households
Stimulated activity	Consumption of natural gas
Subsidy name	Requirement for state-owned domestic gas producers to sell gas for household needs at regulated tariffs
Jurisdiction	National level
Legislation / endorsing organisation	Artcle No. 10 of Law No. 2 467-VI, 2010 (Parliament of Ukraine, 2010b)
Policy objective(s) of subsidy	To ensure reliable gas supply and keep tariffs for households low
End recipient(s) of subsidy	Households
Time period	At least from 2001 by 2016
Background	Under Law No. 2 467-VI (Parliament of Ukraine (2010b) on the Principles and Functioning of the Natural Gas Market, state-owned enterprises (50% and more shares in state ownership) were required to sell all domestically produced gas for the needs of households at regulated tariffs established by the National Commission for State Regulation of Energy of Ukraine (NCSEPU). This law was replaced by the new Law No. 329-VIII (Parliament of Ukraine, 2015b) on the Gas Market, starting from October 2015. The government increased the wholesale gas price for domestic producers to market levels (based on import parity) starting in May 2016. However, the requirement for Ukrgasvydobuvannya to sell produced gas for household needs is still valid, as specified in Cabinet of Ministers Resolution No. 758 of 1 October 2015 (Cabinet of Ministers, 2015a). The value of this implicit subsidy for households is estimated as an opportunity cost for domestic producers (i.e., the sales price that could be recovered in a fully liberalised market). Calculations are based on the annual average gas price at the EU market, purchase prices for gas extracted by Ukrgasvydobuvannya and Chornomornaftogaz approved by the NCSEPU, and the amount of domestically produced gas.
Amount of subsidy conferred	2012: UAH 43.2 bln (USD 5.4 bln) 2013: UAH 44.5 bln (USD 5.6 bln) 2014: UAH 36.7 bln (USD 3 bln) 2015 provisional: UAH 53.9 bln (USD 2.5 bln)
Information sources	World Bank (2015), Naftogaz (2015c) and Resolutions of the NCSEPU establishing purchase prices for gas produced domestically by Ukrgasvydobuvannya and Chornomornaftogaz

Source: OECD (2018b).

Why and how to reform energy subsidies?

This study identifies and quantifies subsidies that skew the "playing field" in favour of fossil fuels, thus presenting barriers to energy efficiency and the development of renewables. This diagnosis signals the need for reforms that would eliminate existing distortions.

While subsidy reform is typically beneficial to the overall economy in the long term, it may have negative effects in the short term on some stakeholders, including the poor and vulnerable social groups. Hence, political barriers hold up reform plans.
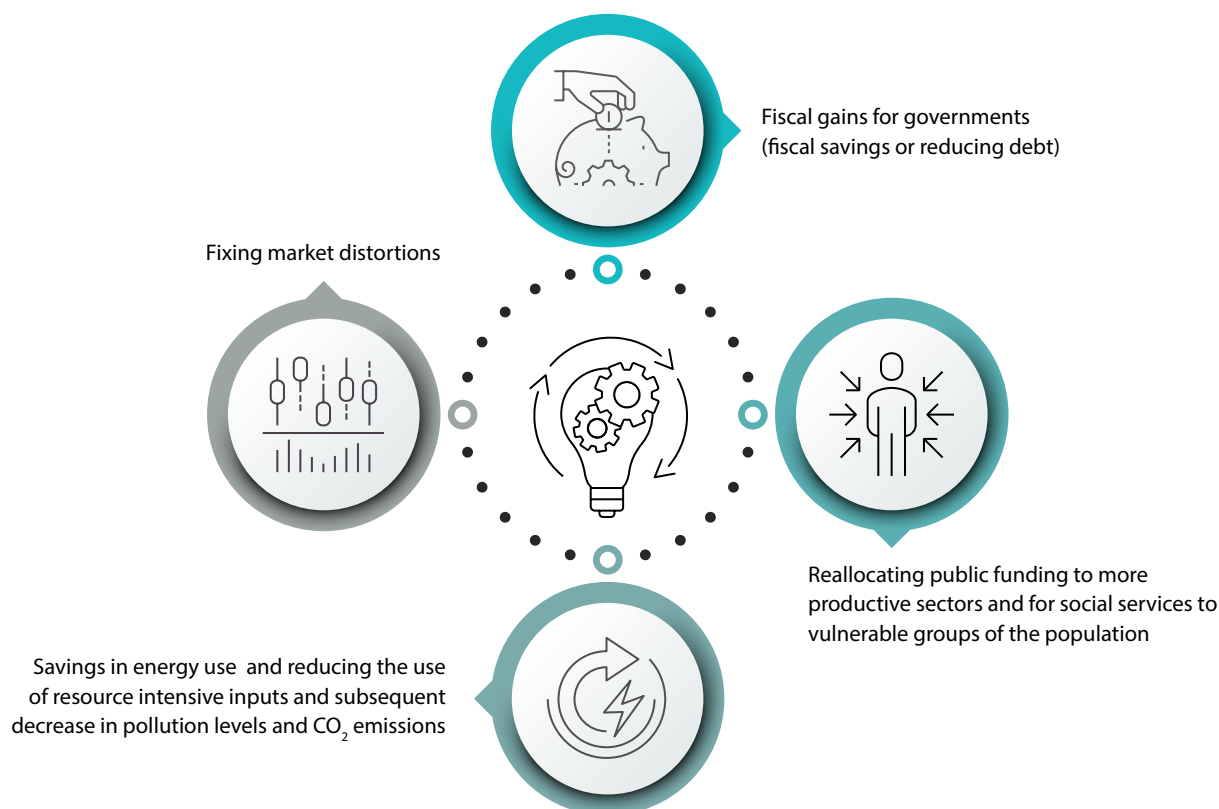
Experience shows that subsidy programmes, once established, long outlast the emergency or other needs that have fostered them. Vested interests quickly develop and vigorously fight proposals that would adversely affect them. Such interests tend to develop inside as well as outside the government, so that a mutually supporting government bureaucracy and industry may command a great deal of political power. Energy subsidy reform faces a number of challenges – whether technical, institutional or political – but it is generally agreed that the main barrier to more rational energy subsidy policies is not economics, but politics (OECD, 2013).

Reforming energy subsidies is a difficult policy choice. To be successful, reform measures require strong political support and the concerted efforts of the whole government.

BENEFITS FROM ENERGY SUBSIDY REFORM

Phasing out environmentally harmful and economically inefficient energy subsidies can help increase the fiscal space for governments to use the saved resources for more targeted support to vulnerable groups. The reform can contribute to fixing market distortions by making prices reflect resource value and making polluters pay for the pollution they cause. Reform measures can also support the overcoming of the technological "lock-in" whereby green technologies are unable to compete on an equal basis with the subsidised sector.

Figure 10. **POSITIVE OUTCOMES OF ENERGY SUBSIDY REFORM**

Fiscal gains for governments (fiscal savings or reducing debt)

Fixing market distortions

Reallocating public funding to more productive sectors and for social services to vulnerable groups of the population

Savings in energy use and reducing the use of resource intensive inputs and subsequent decrease in pollution levels and CO_2 emissions

Source: OECD.

Box 4. **NEED FOR TRANSPARENCY OVER ENERGY SUBSIDIES**

In the EaP region, stakeholders in the energy policy and expert circles are well aware of the cost-recovery issues in the energy system and existing cross-subsidies. However, defining these policies as subsidies is uncommon in the region and cross-subsidies often remain "invisible" for society at large.

In this context and with the aim of improving transparency across different energy subsidies, the EaP governments could consider, among others, to:

● Review and improve the definition of subsidy in national legislation and budgetary documents. A clear definition in line with internationally-recognised practices is the building block for further adequate analysis.

● Regularly estimate tax expenditure that result from various tax breaks and tax advantages provided to individual groups and industries and prepare tax expenditure reports which will inform the legislature and society on fiscal losses from such policies. OECD countries prepare such reports on an annual basis and these reports are available in the public domain.

● Regularly analyse the evolution of subsidies in the sector and maintain a detailed database which can be particularly useful in the decision-making process on energy subsidy reforms.

Source: OECD (2018b).

ELEMENTS OF PREPARING FOR ENERGY SUBSIDY REFORM

There is no "one-size-fits-all" strategy for energy subsidy reform but there are a number of common issues, challenges and potential solutions that have to be taken into account in designing a reform process. Formulating an effective reform strategy will depend on a county's individual objectives and circumstances.
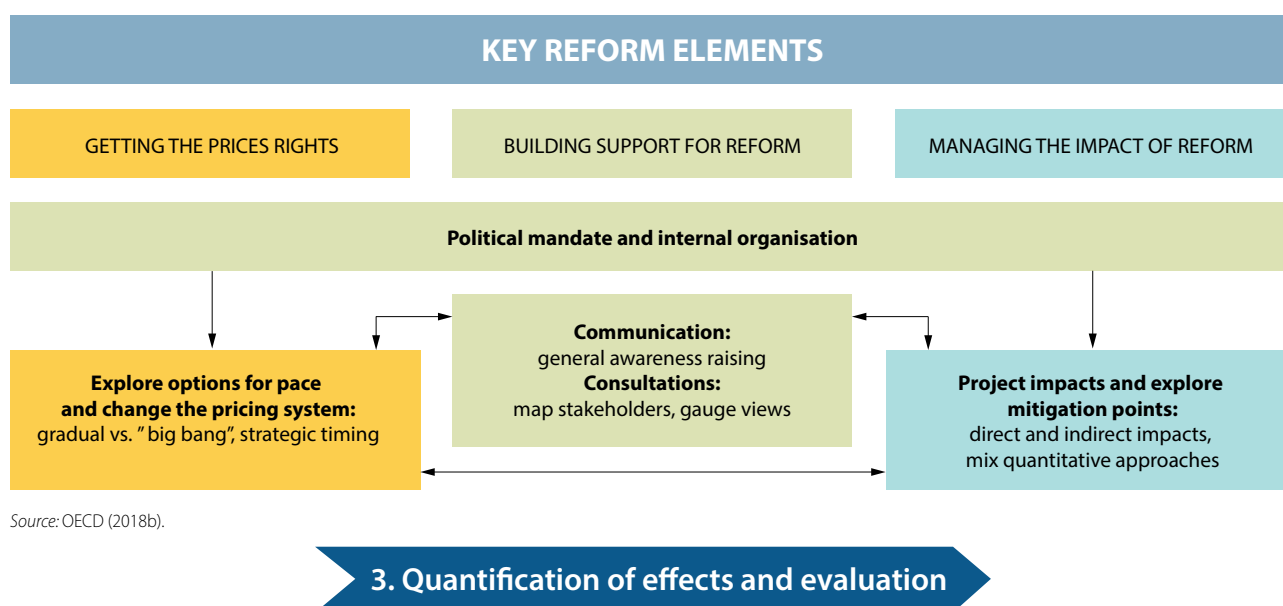
Subsidy reform has to be approached carefully. Experience from around the world demonstrates that energy reform will face strong opposition if the public is not properly consulted and informed, and if compensatory policies are not introduced to protect the poor who might be negatively affected by the reform.

Energy subsidies are usually a long term, structural, problem and they need structural solutions. Many countries formulate effective plans to rationalise

one particular subsidy scheme, but may neglect the broader problem. Thus, governments should prepare for energy subsidy reform holistically.

Experience from other countries shows that a holistic approach to energy subsidy reform includes three main elements:

● **Getting the prices right**: Related to decisions on how to change the pricing systems (e.g., gradual phase-out of subsidies rather than a one-off big increase of prices is often preferable) and when to change prices (e.g., falling oil prices could be an opportunity for governments to launch reforms);

● **Building support for reform:** Through a clear communication strategy, stakeholder consultations, and transparency about fuel prices;

● **Managing the impacts of reform:** Monitoring the impacts of reform implementation with adjustments, if necessary.

Figure 11. **A HOLISTIC APPROACH TO ENERGY SUBSIDY REFORM**

KEY REFORM ELEMENTS

GETTING THE PRICES RIGHTS	BUILDING SUPPORT FOR REFORM	MANAGING THE IMPACT OF REFORM

Political mandate and internal organisation

Explore options for pace and change the pricing system: gradual vs. "big bang", strategic timing

Communication: general awareness raising
Consultations: map stakeholders, gauge views

Project impacts and explore mitigation points: direct and indirect impacts, mix quantitative approaches

Source: OECD (2018b).

3. Quantification of effects and evaluation

MANAGING THE IMPACTS OF REFORM

Recommendations on the pace and structure of the required changes in energy pricing and taxation, communication strategies and designing policies on mitigating possible negative impacts of the reform all depend on individual country contexts. Meanwhile, energy subsidy reform always requires research, consultations and efforts across many agencies within the government and groups of stakeholders. This is particularly true in terms of anticipating and managing the reform's impact that can be both direct and indirect.

Managing the impacts of energy subsidy reforms also necessitates complementary policies that span macroeconomic, social, industrial, energy, transport, banking and environmental solutions. Figure 12 provides a summary of examples of such policies that can be considered as part of the reform plan.

While the reform of energy subsidies is both complex and politically sensitive, it is truly at the heart of sustainable development and the shift to a low-carbon economy. The EaP countries have already accumulated a wealth of experience reforming their energy subsidies and this experience can help them move further along this challenging, but unavoidable, path.

Figure 12. **COMPLEMENTARY POLICIES FOR MANAGING IMPACTS OF ENERGY SUBSIDY REFORM**

Industry/business	Social	Energy
• Sectors e.g. retraining programmes • Measures to improve energy efficiency • Investments in infrastructure	• Cash transfers: (un)conditional • Social safety nets, pensions, health insurance, increase of (minimum) wages • Pro-poor expenditure	• Investment in renewable or alternative energies, rural electrification, etc. • Energy conservation, energy security, energy efficiency policies
Macro-economic	**Banking**	**Transport**
• Policies to manage inflation • Strengthening of market forces and encouraging competition	• Can help roll out cash transfers • Credit facilities, e.g. for small and medium-sized enterprises and micro-credit	• Expanding public transport systems • Alternatives for freight (rail or inland waterways) • Transitional support for taxi drivers

Source: OECD (2018b).

# Energy subsidy reform and energy affordability
Example from Moldova

Energy affordability is a particular concern for decision makers when considering energy subsidy reforms. Raising energy prices can make good economic and environmental sense, but should not lead to affordability challenges. Using part of the additional revenue generated from higher taxes, for example, can help avoid increased energy affordability risk and even reduce it if sufficient revenue is allocated to support vulnerable consumers (OECD, 2018a).

The OECD worked with the government of Moldova to analyse the potential fiscal, social and environmental impacts of reforming major existing energy subsidy schemes designed to support residential consumers in Moldova. The subsidy measures analysed in this work include: i) a reduced VAT rate on natural gas consumption; ii) VAT exemption on electricity; and iii) VAT exemption on heating.

The analysis shows that reforming the VAT-related energy subsidies in Moldova, i.e. an increase of the VAT rate to the standard 20% and a subsequent increase of the gas, electricity and heat tariffs for households, is worth implementing because the reform can yield significant budget revenue and a reduction (albeit modest) of GHG emissions. However, given the significant impact of the VAT

Figure 13. **IMPACT OF SCENARIOS FOR INCREASING VAT ON HEAT CONSUMPTION, SHARE OF HOUSEHOLD INCOME IN MOLDOVA**
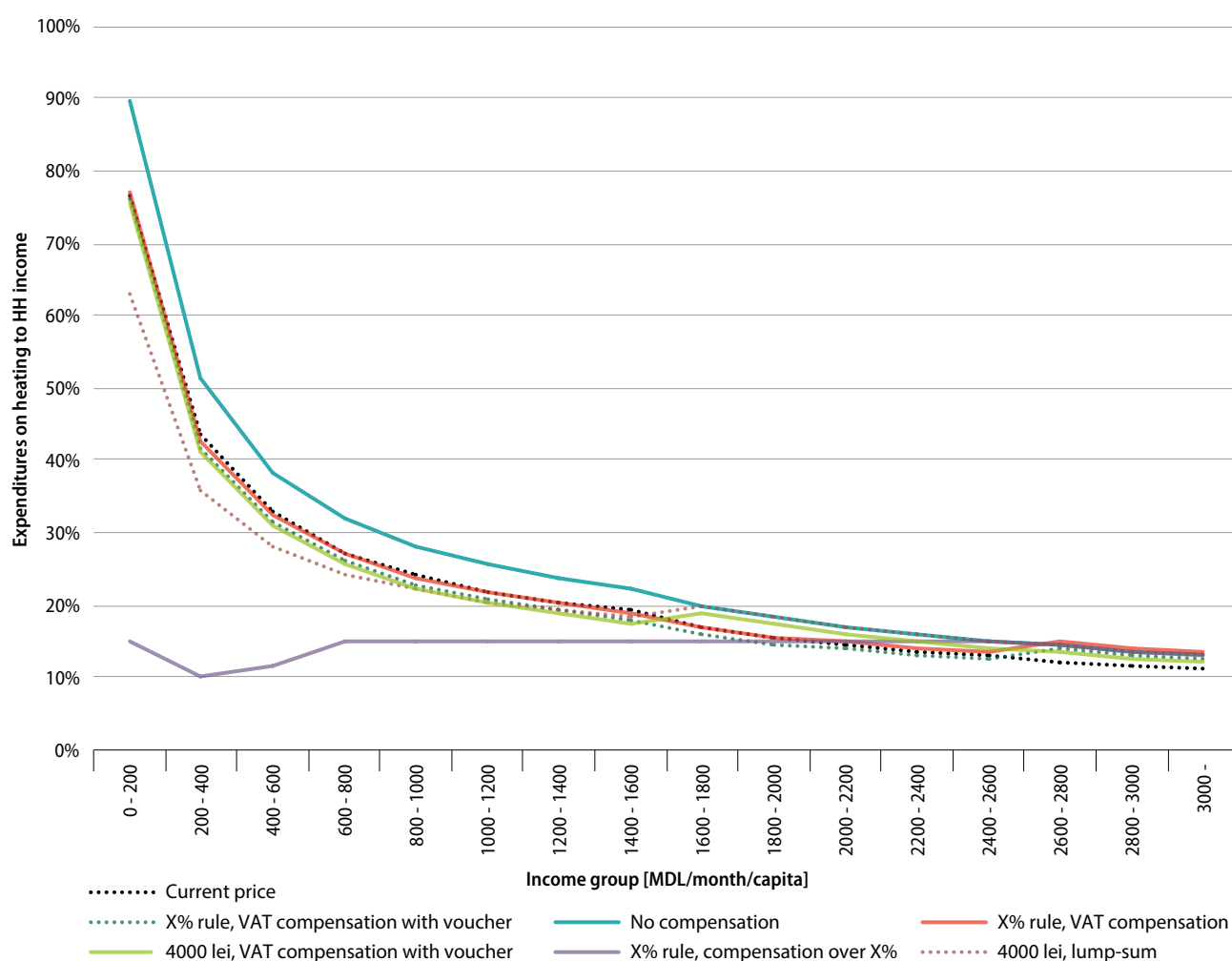
Source: OECD (2018a).

increase on consumer end-price and the related household spending on energy, the reform should not be introduced before a robust system of social protection measures is put in place. The OECD study analyses five different protection measures, while also estimating their costs.

The results of the analysis show that raising the VAT rate for electricity consumption will be the easiest reform to roll out. This will have only a small impact on household electricity use and household income. On the other hand, increasing the VAT rate for heat consumption will significantly raise the costs to households. Low-income groups (with income ranging from Moldovan Lei (MLD) 0-1 000 per capita per month) would be hard hit by such an increase. If the

VAT rate on heat is increased, the share of the heat consumption bill in household disposable income alone will be above 20% for these income groups. Without a proper compensation arrangement to support the vulnerable parts of the population such a reform would be difficult to implement from the viewpoint of social acceptability.

Implementing the reforms in Moldova will not be easy and will require political will. To carry out these reform measures, Moldova will need to do more work to translate this analysis into actual legislative proposals. Any new fiscal policy package should include, among others, a clear definition of targeted low-income households and a carefully designed and resourced system to deliver social support.

Further reading

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Country studies in national languages: http://www.oecd.org/env/inventory-of-energy-subsidies-in-the-eu-s-eastern-partnership-countries-9789264284319-en.htm

Energy subsidies in the EU's Eastern Partnership Countries: **Armenia** (in Armenian)

Energy subsidies in the EU's Eastern Partnership Countries: **Azerbaijan** (in Azerbaijani)

Energy subsidies in the EU's Eastern Partnership Countries: **Belarus** (in Russian)

Energy subsidies in the EU's Eastern Partnership Countries: **Georgia** (in Georgian)

Energy subsidies in the EU's Eastern Partnership Countries: **Moldova** (in Romanian)

Energy subsidies in the EU's Eastern Partnership Countries: **Ukraine** (in Ukrainian)

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OECD – IEA, *Fossil Fuel Support and Other Analysis Website*: http://www.oecd.org/site/tadffss/.

Green Finance and Investment

INVENTORY OF ENERGY SUBSIDIES IN THE EU'S EASTERN PARTNERSHIP COUNTRIES

This publication was prepared within the framework of the "Greening Economies in the Eastern Neighbourhood" (EaP GREEN) Project, supported by the European Union and co-ordinated with governments of the EaP countries and United Nations (UN) partners: UN Economic Commission for Europe, UN Environment and UN Industrial Development Organization.

This report aims to provide the first comprehensive and consistent record of energy subsidies in the EaP region, with a view of improving transparency and establishing a solid analytical basis that can help build the case for further reforms in these countries. The study covers Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine.

Based on OECD standard methodology, the study provides quantitative estimates of government support made available to producers and consumers of coal, oil and related petroleum products, natural gas, as well as electricity and heat generated on the basis of these fossil fuels. The report also briefly analyses public support allocated to energy-efficiency measures and renewable energy sources in the EaP countries, and discusses the taxation and energy pricing policies that underpin the analysis of energy subsidies.

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