Policy Note

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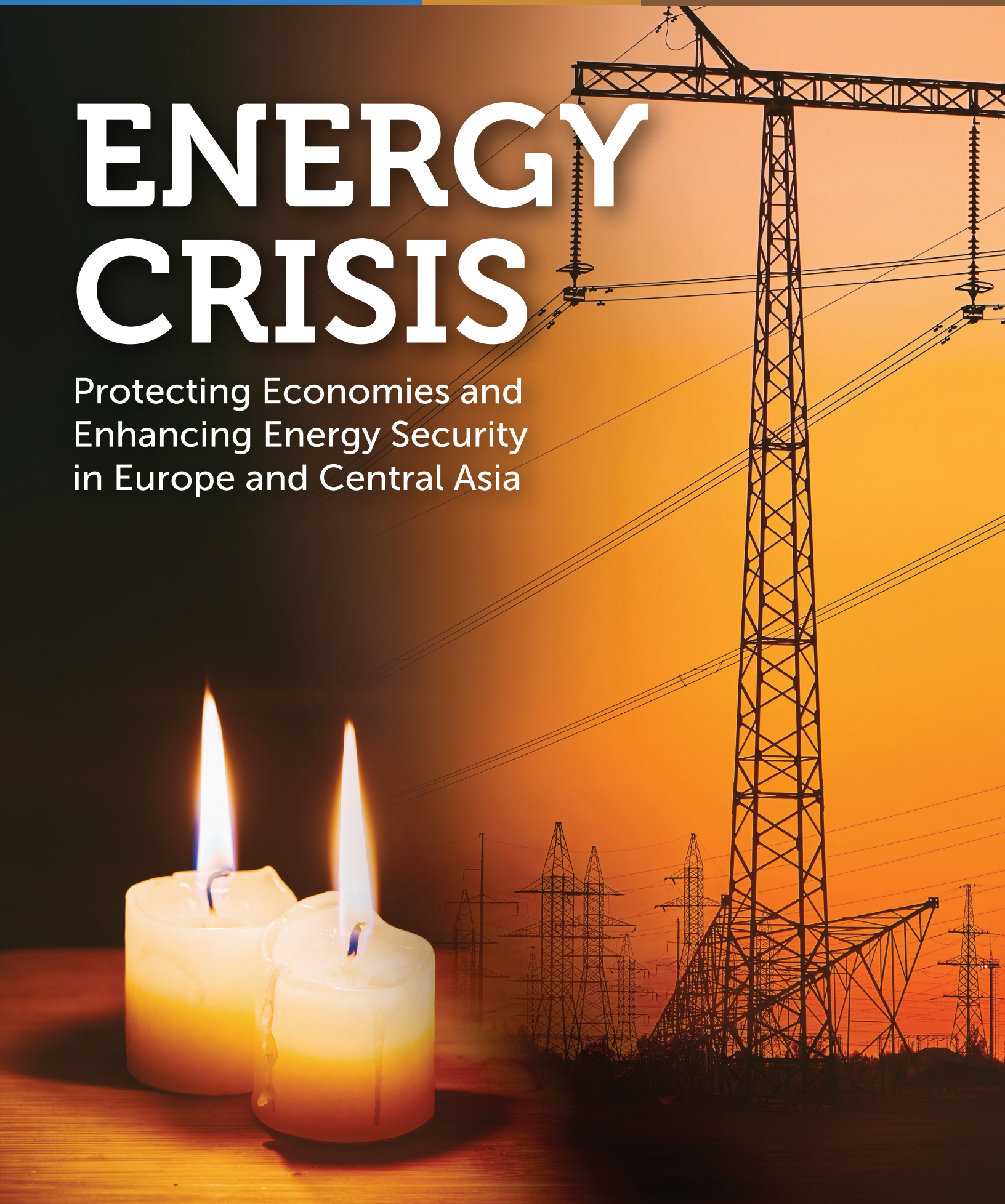
WORLD BANK GROUP

ENERGY CRISIS

Protecting Economies and Enhancing Energy Security in Europe and Central Asia



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Country Codes

Albania	ALB	Latvia	LVA
Armenia	ARM	Lithuania	LTU
Austria	AUT	Luxembourg	LUX
Azerbaijan	AZE	Malta	MLT
Belarus	BLR	Moldova	MDA
Belgium	BEL	Montenegro	MNE
Bosnia and Herzegovina	BIH	Netherlands	NLD
Bulgaria	BGR	Norway	NOR
Croatia	HRV	Poland	POL
Cyprus	CYP	Portugal	PRT
Czechia	CZE	Republic of North Macedonia	MKD
Denmark	DNK	Romania	ROU
Estonia	EST	Russian Federation	RUS
Finland	FIN	Serbia	SRB
France	FRA	Slovak Republic	SVK
Georgia	GEO	Slovenia	SVN
Germany	DEU	Spain	ESP
Greece	GRC	Sweden	SWE
Hungary	HUN	Switzerland	CHE
Iceland	ISL	Tajikistan	TJK
Ireland	IRL	Türkiye	TUR
Italy	ITA	Turkmenistan	TKM
Kazakhstan	KAZ	Ukraine	UKR
Kosovo	XKX	United Kingdom	GBR
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1 Introduction

The Europe and Central Asia (ECA) region is experiencing an unprecedented and widespread increase in energy prices, which started to rise in early 2021 and skyrocketed in 2022, with the prices of oil, gas, and coal rising by orders of magnitude more than in previous years. These increases stem primarily from a gas supply shock that widened after rising demand following a sharp slowdown in economic activity during the COVID-19 pandemic and insufficient investments in renewable energy, energy efficiency, and upstream gas, coupled with supply shortfalls following the Russian Federation's invasion of Ukraine. The ECA region has been hit especially hard, because of its dependence on natural gas from one principal supplier (Russia); dependency on pipeline technology for the transportation of natural gas; close linkage between electricity and natural gas prices; a dry and hot summer, which reduced production of hydropower and power from water-cooled thermal power plants; and technical events that reduced nuclear power capacity in France. Forty percent of total gas imports in Europe used to come from Russia, with the figure even higher in some ECA countries.

These price increases make heating and electricity largely unaffordable, which has led governments to provide widespread, temporary subsidies as households and firms, still recovering from the pandemic, are unable to absorb the price shock. Living at low indoor temperatures poses health risks, especially for young children and the elderly. Increased exposure to cold temperatures will also increase the burden on health systems. The crisis is expected to cause many households to revert to coal and firewood, which will raise already high levels of air pollution. Firms that were recovering from the drop in revenues during COVID-19 are now facing an unprecedented shock. As the shock is having a broad impact on

energy commodities, they find it difficult to substitute for cheaper fuels (World Bank 2022a). In response, national governments have announced targeted social protection measures and financial assistance (including price caps) to household consumers and small and medium-sized enterprises (SMEs) and launched energy conservation programs.

In the short term, ECA countries have sought to find alternate supplies of natural gas, given its primary role in heating, as well as industrial and electricity production, which is facilitated by the emergence of floating liquefied natural gas (LNG) import and transportation infrastructure, albeit at higher prices. Other countries have reverted to using mothballed coal plants on a temporary basis, some are extending the lifetime of coal/lignite power plants, while others are considering the expansion of nuclear power and accelerating the clean energy transition. The benefits of regional market integration and regional trade include a hedge against individual country gas and electricity shortages, but they come at the cost of higher price volatility in a crisis.

The materialization of geopolitical risks has undermined economic prospects and brought to the fore acute concerns about energy security in the region. The energy shock has significant macroeconomic and fiscal implications. Record-high energy prices are feeding into inflationary pressures that started building up before the war in Ukraine, with both headline and core inflation reaching multi-decade highs. As the supply of natural gas is relatively inelastic in the short term because it requires its own regional infrastructure, economies are vulnerable to cuts in supply, which raise prices.

The current natural gas price shock is already longer than typical spikes in the past. It has a far-reaching impact on economies that varies with their energy trade status. Previous spikes in natural gas prices typically lasted only a few months. The current gas supply shock has led to price surges in a broader set of energy-related commodities. In energy-importing economies, higher energy prices reduce the real disposable income of households, raise production costs for firms, and tighten financial conditions. Energy-exporting economies may benefit from improved terms of trade and higher commodity production, but global output is reduced.

The complex geopolitical situation in the region affects natural gas prices. The European Union (EU) has announced plans to ban or phase

out oil imports from Russia in two phases, in December 2022 and February 2023. The Group of Seven has announced a price cap on Russian oil. On August 31, 2022, Russia shut down one of its main natural gas pipelines, Nord Stream 1, to Europe. In September 2022, significant leaks were discovered in the Nord Stream pipelines. Two other pipelines serving Eastern Europe remain operational, although Russia has restricted the flow of gas through them officially because of technical reasons. To address the energy security concerns, countries are filling gas storage levels (EU gas storage is 88 percent full) and securing alternative LNG gas supplies. However, gas shortages in the EU and ECA remain possible this winter, as storage is not sufficient to meet the regular winter consumption, which must be supplemented by continuous production or purchases of gas.

This companion piece to the Fall 2022 *ECA Economic Update* (World Bank 2022c) provides an overview of the policy options available to countries to respond to the energy price shock and examines how this crisis could harness the clean energy transition to enhance collective energy security. The options to support energy markets, vulnerable households, and firms will vary, depending on specific country contexts, including exposure to gas and electricity supply risks and the fiscal space available to mitigate their impact. Well-coordinated and calibrated fiscal and monetary policies are needed to manage the impact of the price shock. Countries will also need to consider the implications of any policy choice on the transition to a greener economy and development trajectories.

This note is organized as follows. Section 2 provides an overview of the broader economic impact of the energy price shock on economic growth, inflation, and public finances in the ECA region. Section 3 provides policy options to help countries adapt to the energy crisis related to managing both demand and supply. Section 4 presents a set of principles to guide the policy response for supporting vulnerable households. Section 5 presents a set of principles to guide the policy response for supporting firms. Section 6 concludes with a summary of recommendations for dealing with the crisis and transitioning to a greener economy.

2 Impact of the energy crisis on economic growth, inflation, and public finance

2.1 Growth and external balances

An extended Russian cutoff of energy supplies to the EU could trigger a recession in ECA in 2023. The impact of Russian energy supply shocks on growth is estimated to be large, primarily because of negative spillovers from the euro area (World Bank 2022a, 2022b). Without policy measures to alleviate natural gas cutoffs, the impact on ECA's EU countries could range from minimal in a typical winter to a drop of more than 6 percent of gross domestic product (GDP) in a harsh one (Ari and others 2022). A shutoff of Russian energy to the EU could reduce ECA GDP growth in 2023 by 1.5 percentage points, with output contracting 1.2 percent rather than expanding 0.3 percent, as envisioned in the baseline (World Bank 2022b). The negative spillovers would be most extensive for economies that rely heavily on Russian energy imports and/or economies in which trade and financial linkages with the euro area and/or Russia are especially tight. Countries through which the natural gas supply routes go that are facing pipeline shutoffs could experience significant natural gas shortages, with an extremely high price to clear the market. The damage is expected to be more moderate in economies with sufficient domestic energy production, alternative natural gas supply routes, and an energy mix that relies less heavily on natural gas.

Energy-related transfers and subsidies announced by some governments in the region to protect consumers and firms from the impact of the shock have reduced the elasticity of energy demand by muting price signals. Artificially suppressed energy prices will lead to increased consumption and may intensify the energy crisis. But allowing gas prices to rise sharply could accelerate the obsolescence of the existing inefficient (energy-intensive, gas-reliant) capital stock and cause significant labor reallocation. The change in relative prices has implications for the competitiveness of gas-intensive, heavy, and chemical industries. If supply constraints persist over the medium term, additional adverse effects from offshoring selected energy/gas-intensive industries are possible. Overall, the shock is likely to result in a slowdown in growth, with downward price rigidity complicating relative price adjustments.

The energy shock also has important demand-side effects in terms of redistributing income to energy exporters/producers that have a lower marginal propensity to consume than energy importers, thus reducing global demand growth over the medium term. It will likely lead to an investment push to diversify energy sources, such as investments in LNG terminals, renewables, coal and nuclear power generation, and energy storage, as well as an increase in energy efficiency. The surge in investment could stimulate aggregate demand and affect equilibrium interest rates. The price shock will have significant adverse consumer welfare effects, however, with the decline in real incomes causing significant distributional shifts. In the short term, there is a potential trade-off between current consumption and investment, with ambiguous effects on overall aggregate demand.

The energy price shock affects external balances. The energy price shock is a large terms-of-trade shock for energy importers. Given the overall increase in fossil fuel prices, there are fewer opportunities for substitution than in previous shocks. As a result, large external imbalances are apparent in several energy importers in the region and beyond. In Bulgaria, Kosovo, Moldova, North Macedonia, Poland, Romania, Serbia, and Türkiye, current account balances are projected to widen by at least 3 percentage points of GDP in 2022 compared with the pre-COVID-19 period; current account balances are projected to exceed 5 percent of GDP in Albania, Armenia, Georgia, Kosovo, the Kyrgyz Republic, Moldova, Montenegro, and North Macedonia. Countries that relied heavily on imports of natural gas are particularly exposed to current account pressures.

2.2 Inflation and the financial sector

In many countries, inflation has reached levels not seen in the region in decades, raising concerns about de-anchoring inflation expectations. Inflation was rising before the war in Ukraine, but the war has sharply increased energy and food prices. The energy price shock has contributed to a surge in inflation in emerging markets and developing economies in the region and is contributing to second-round inflationary effects. On average, higher commodity prices explain more than 60 percent of the increase in headline inflation. In some emerging economies, food inflation has contributed more than energy prices. The magnitude of the energy and food price shocks and second-round effects, including an increase in service inflation and sharp increases in foreign prices, poses an upside risk to inflation. It is projected to be persistent, although inflation is projected to decelerate in 2023 (Guénette, Kose, and Sugawara 2022).

The overlapping crises make the calibration of monetary policy challenging. The standard response to price shocks is to accommodate first-round effects and tighten monetary policy to limit second-round effects. The acceleration of inflation forces policy makers to choose between reining in inflation, avoiding de-anchoring inflation expectations, and warding off recession. High inflation rates and the acceleration of core inflation call for a tightening of monetary policy; real interest rates are still below levels considered to be neutral. But high inflation is eroding real incomes, leading to a deceleration in household consumption and aggregate demand and increasing the risk of recession, notwithstanding large fiscal support packages. This implies a need to proceed cautiously with monetary policy tightening. It is critical that central banks maintain independence and communicate clearly. In countries where their credibility is weaker, the risks of de-anchoring inflation expectations and wage-price spirals are likely higher than in countries where central banks are more credible.

Tighter financial conditions are likely to contribute to increased financial stress among firms, with implications for financial sectors. Some power and gas utilities could come under financial stress, as many entered the current crises from a weakened position because of the COVID-19 crisis, increased costs linked to system losses not transferred to tariffs, and

delays in the compensation of the tariff deficit. State-owned utilities in financial difficulties represent an increase in contingent liabilities for the public sector. The risk of financial stress is also high for households, especially in countries where a large share of household debt, including mortgages, is at a variable rate. More broadly, the increased cost of debt servicing will likely weigh on domestic demand.

Public finances 2.3

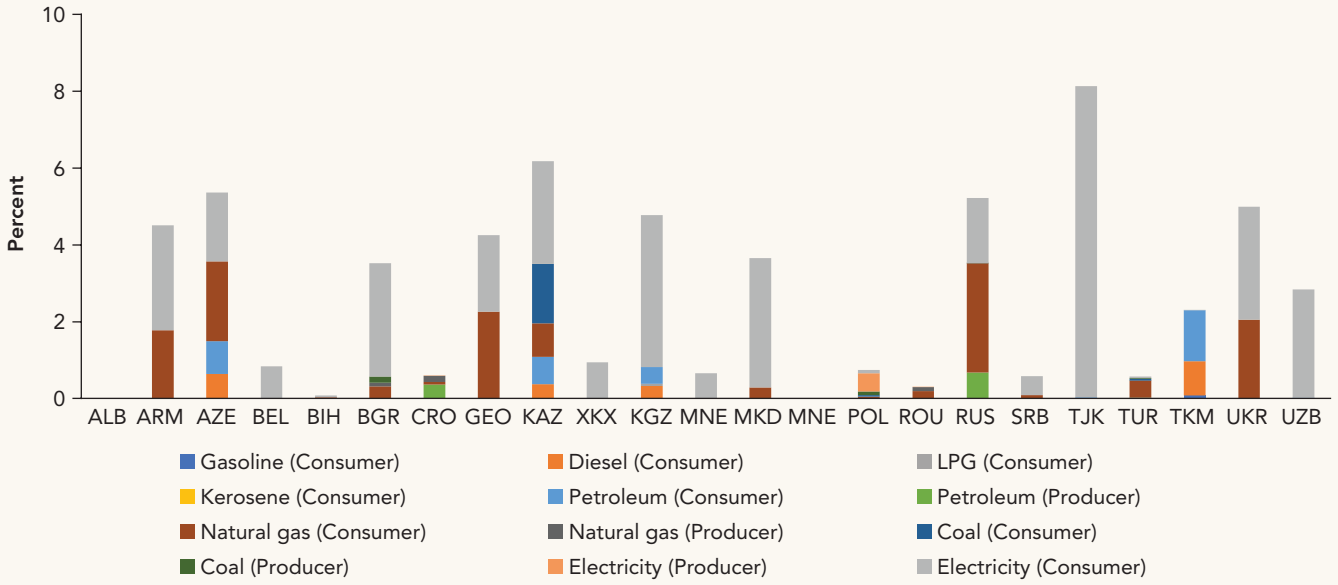
Public finances deteriorated during the COVID-19 crisis; the energy price shocks add to that strain. Government deficits widened in many developing countries in 2022, and debt-to-GDP ratios increased considerably due to overlapping crises and governments' responses to mitigate their impact (World Bank 2022a). Significant losses in real incomes have distributional consequences; increased risks of income poverty and energy poverty, which prompt governments to step in with additional fiscal support, put further pressure on public finances. In countries with substantial fossil fuel subsidies that have limited the pass-through of energy prices to consumers, the fiscal costs are likely to increase markedly.

For energy-importing countries that subsidize energy prices, the risk of increased fiscal pressures is higher in the context of the sharp rise in energy prices. Even before the current price surge, combined subsidies for natural gas and electricity exceeded 3 percent of GDP in Armenia, Azerbaijan, Bulgaria, Georgia, Kazakhstan, Kyrgyzstan, North Macedonia, Russia, Tajikistan, and Ukraine (figure 2.1). The current energy crisis risks further increasing the fiscal burden in these countries, but also represents an opportunity to improve targeting and fairness as governments across ECA countries are looking at ways to shield consumers and firms. In countries with limited fiscal space that cannot adequately compensate fuel suppliers for the increase in energy costs, the risk of fuel supply disruptions is particularly high.

The fiscal impact of the energy price shock will be heterogeneous, determined by existing policies, such as fuel subsidization, and the response to the latest energy price shock. In response to the sharp increases

FIGURE 2.1

Energy subsidies as a share of GDP, by energy carrier in ECA countries



Source: Di Bella and others 2022.

in energy prices that began in summer 2021, countries in the region implemented policies to cushion the impact, most of which were announced as temporary and time bound. Most countries—including Bulgaria, Bosnia and Herzegovina, Croatia, Kosovo, Moldova, North Macedonia, Poland, Romania, Serbia, and Türkiye—implemented measures to mute the energy price increase pass-through (Ari and others 2022). These measures included cuts in consumption taxes (value-added, sales, and excise taxes); reductions in customs duties; reductions in energy bills; and price caps, freezes, and subsidies. Many of these policies are suboptimal, as they benefit all consumers, forgo significant revenues, and reduce the impact on energy demand.

Moreover, taxes such as excises on fuels help internalize negative externalities. Many countries complemented these policies with targeted measures to protect households, such as cash transfers and vouchers, and less targeted support measures, such as personal income tax relief, heating subsidies, and energy efficiency grants and subsidies. The risk to public finances from potential bailouts or recapitalization of energy importers and/or companies deemed strategic to national security has also risen, given the intensification of the energy crisis and contingent liabilities linked to state-owned enterprises (SOEs). Some countries in ECA are considering tax surcharges on windfall profits from non-gas energy

generation. Such measures should be time bound and temporary because they could be counterproductive in the long term if they result in lower investments when increased investments are needed. Other tax designs that are less distortionary—such as taxing excess profits and using the additional fiscal revenues generated to protect vulnerable households and heavily affected viable firms—could be considered.

Fiscal policies play a critical role in cushioning the impact of the energy price shock, but they should reflect countries' fiscal space and not run counter to monetary policy objectives. The response should be time bound. It could include increased transfers and subsidies to consumers to cushion the impact on real incomes and to firms to preserve viable firms. The fiscal response should consider country circumstances, including the strength of social safety nets (World Bank 2018), risks to energy security, and fiscal space.

3 Energy policies

ECA countries are not equally exposed to the energy price crisis. The most exposed countries are those with over 10 percent reliance on natural gas imports for heating, industry, or electricity; and/or over 10 percent reliance on electricity; and/or a high level of coordination with EU energy markets through physical, geographical, or market connections. These ECA countries include Albania, Bulgaria, Croatia, Georgia, Moldova, North Macedonia, Poland, Romania, Serbia, Türkiye, and Ukraine ("***importing ECA countries***" table 3.1). Other ECA countries are less exposed to the current price shocks including oil and gas producers and exporting countries. This energy chapter covers gas and

TABLE 3.1

Gas and electricity import dependency and coordination with EU energy markets in Europe and Central Asia in 2019

Coordination with EU energy markets	Dependency on gas (G) and/or electricity (E) imports		
	High	**Medium**	**Low**
High	Croatia[G,E]	Bulgaria[G,E], Poland[G,E], Romania[G,E],	
Medium	Albania[G], Georgia[G], Moldova[G,E], North Macedonia[E], Türkiye[G,E], Ukraine[G]	Serbia[G,E]	Bosnia and Herzegovina, Kosovo, Montenegro
Low	Armenia[G,E], Belarus[G,E]		Azerbaijan, Kazakhstan, Kyrgyz Republic, Russian Federation, Tajikistan, Turkmenistan, Uzbekistan

Source: World Bank analysis.
Note: For gas, High is a gas share in the total energy supply of at least 20 percent and gas import dependency of at least 30 percent in 2019; Medium is a gas share in the total energy supply of at least 10 percent and gas import dependency of at least 10 percent in 2019. For electricity, High is electricity imports of at least 20 percent or a share of gas-fired power of at least 20 percent and gas import dependency of at least 50 percent in 2019; Medium is electricity imports above 10 percent or gas-fired power of at least 5 percent and gas import dependency of at least 10 percent in 2019. Low is for countries where dependency on both natural gas and electricity imports are low in 2019. Countries classified as low have no superscripts for gas and electricity price shocks. This energy risks assessment excludes vulnerability to oil price shocks, which may also become relevant in the coming months.

electricity price shocks, while excludes analysis of recent oil price shocks, which can also become relevant in the coming months.

In the EU, the share of energy traded on short-term markets has risen, increasing the price volatility in ECA countries with high levels of coordination with EU energy markets. Current gas shortfalls exacerbate this volatility. Bulgaria, Croatia, Poland, and Romania have fully integrated electricity markets with the EU and are the most affected. Albania, Bosnia and Herzegovina, Georgia, Kosovo, Moldova, North Macedonia, Serbia, Türkiye, and Ukraine are partially coordinated with EU electricity markets (physically or institutionally through the European Network of Transmission System Operators for Electricity and therefore also subject to high prices and volatility). The current crisis may also affect low-risk ECA countries, through the opportunity cost of international gas prices, even if domestic prices are regulated, because countries may decide to increase the volume of natural gas they export, limiting domestic supply.

Additionally, dependence on a single supplier and/or a single technology (e.g. a certain pipeline) increases vulnerability of ECA countries. **Countries in ECA vary in their reliance on a single supplier, Russia, for gas, from 100 percent in countries such as Moldova, North Macedonia, and Serbia to 34 percent in Türkiye.** Several ECA countries also rely on a single pipeline for gas imports. For example, countries receiving natural gas from Russia through Friendship II pipeline (transit through Ukraine to EU, Belarus) and TurkStream pipelines (Türkiye, Bulgaria, Serbia, Bosnia and Herzegovina, Kosovo) can face gas shortfalls if ongoing technical and commercial debates are not resolved and result in pipeline shutdowns**.** Political and commercial relationships—long-term or preferential contracts and access to alternative fuels—can mitigate or exacerbate risks. Subregions, cities, and industries in low-risk countries can be highly exposed. The risks are rapidly evolving, as technical and geopolitical events take place and as mitigation measures are being introduced.

Past crises in Ukraine (2015), Japan (2011), Brazil (2002), China (2003), and globally (1970s) witnessed long duration supply shortfalls that resulted in high prices and/or unserved demand in the medium term unless governments intervened. *Importing ECA countries* face such prospects. In contrast, *exporting countries* can benefit from increasing revenues to offset higher domestic subsidy costs or increase investments. In general, wealth will be transferred from importers to exporters.

Based on lessons from previous crises, governments fare well when a few key principles govern interventions (table 3.2):

1. Interventions should be transparent, fully budgeted, and time bound.
2. As price signals are critical, energy consumers, not taxpayers, should bear most of the financial burden. Governments should therefore consider recovering funds over a certain period, at least partially.
3. Price signals will incentivize new energy investments and infrastructure in a competitive manner.
4. Interventions to mitigate impacts on household consumers should be targeted to vulnerable and low-income households.
5. Short-term interventions should not incentivize households and firms to lock in fossil fuels.

Good-practice policies relevant to the current crisis include policies targeted at diversifying energy supply, encouraging energy savings, and

TABLE 3.2

Good-practice energy policies for Europe and Central Asia

Policy sets	Target for natural gas replaced in RePower EU by the end of 2022 (billion cubic meters)	Good-practice policy	Examples
Diversify energy supply by - LNG diversification - Alternative pipeline imports - Renewable gas and hydrogen	64	Boost alternative gas and electricity sources to mitigate supply-side shortfalls and resulting price hikes.	1970s crises, European Union 2022
Save energy and increase energy efficiency in buildings and industry	18	Launch a public campaign for gas and electricity conservation (encouraging firms and households to turn down thermostats in the winter to 18°C–20°C, for example). Design and put in place quota systems for use in times of gas and electricity shortages. Review, update, and publicize rationing plans.	Brazil 2000s, Japan 2011, Ukraine 2015, European Union 2022
Accelerate clean energy	20	Support price signals essential for investment in bioenergy, wind, solar, rooftop solar, electrification, fuel switching, and energy efficiency.	European Union, Portugal, and Spain 2022

Source: World Bank analysis.

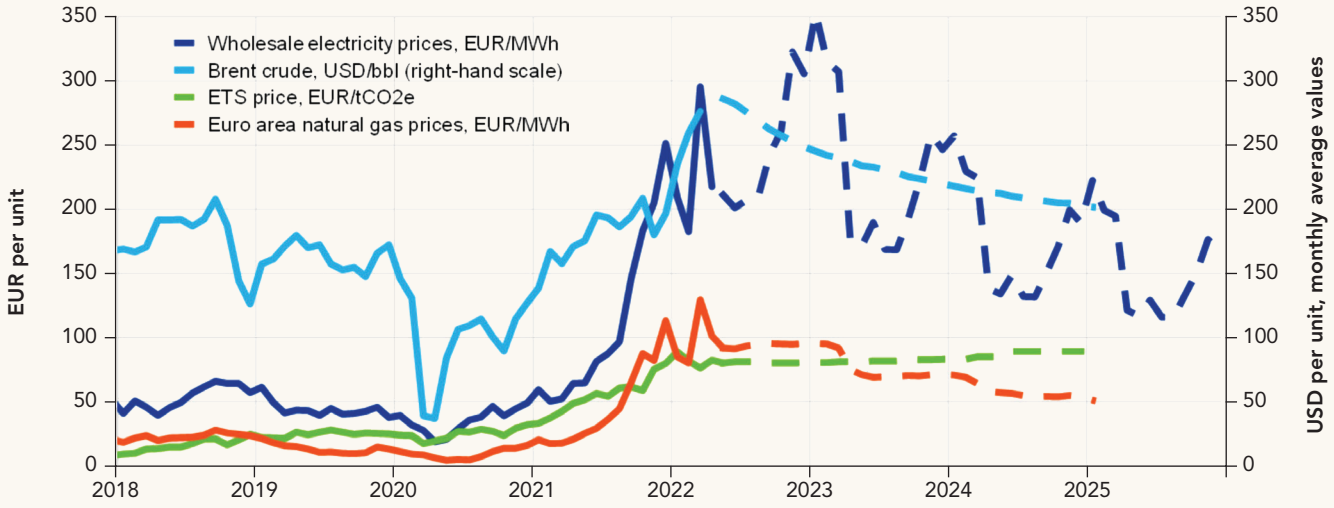
accelerating the adoption of clean energy. All three policy sets are relevant for importing ECA countries. Energy-efficiency aspects of energy savings and the acceleration of clean energy adoption are most relevant for low-risk countries.

Good-practice policies to diversify gas and electricity supply during a crisis 3.1

Energy prices in Europe are expected to remain high through at least 2025, with large spikes in gas and electricity prices in the coming heating season. Upstream European gas investments for domestic production have been declining, and there is limited flexibility in the global gas markets to supply alternative natural gas to the ECA region. The region's largest importer from Russia was the EU, followed by Türkiye. The International Monetary Fund (IMF) estimates that "alternative sources of energy could replace around 80 billion cubic meters of Russian gas in 2022" (52 percent) by the end of 2022. This estimate is higher than the estimate by the International Energy Agency (IEA) of 35 percent. The

FIGURE 3.1

European electricity and natural gas wholesale prices through 2025



Source: Kuik and others 2022.
Notes: Futures curves from April 29, 2022 are represented by broken lines.

IMF and IEA estimates leave a supply gap of 48–65 percent of Russian imports.

The most effective policy responses to the oil crises in the 1970s were the longer-term initiatives to diversify energy supplies and invest in energy efficiency, resource efficiency, and productivity improvements driven by cleaner technology innovations. They were not effective in protecting against carbon lock-in, however. In response to the 1973 crisis, the IEA was formed, in November 1974, to promote energy security and cooperation on energy policy, such as supply diversification and national storage requirements. Some policies adopted in the 1970s led to long-term stagflation and carbon lock-in. Central banks responded to the resulting inflation by delaying interest rate hikes, and many governments introduced price regulations and quota systems for oil. Some measures to increase the diversification of energy supply resulted in new, large-scale coal investments in advanced economies, building on cheap coal reserves. These investments accelerated the climate crisis.

ECA countries with high levels of coordination with EU energy markets (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Georgia, Kosovo, Moldova, North Macedonia, Poland, Romania, Serbia, Türkiye, and Ukraine) can mitigate the impact of supply shortfalls through electricity supply measures:

- **Electricity prices have skyrocketed due to high gas prices.** In coordinated wholesale electricity markets, the highest marginal price, often from a natural gas–based power plant, determines the electricity price for the entire region. All regional electricity generators receive the same price for a unit of electricity they are selling at a given moment. As the current high natural gas prices are reflected in high marginal prices, this price mechanism results in high electricity prices even in countries where the power mix includes little or no natural gas.

- **Fuel and capacity shortages could lead to disruption of electricity systems in ECA as early as this winter.** Almost every power system in the world has been subject to some form of shortage and/or service disruption because systems are not designed to respond to unforeseen, unprecedented disruptions and shocks, such as the current crisis in Europe. However, a few examples of long-duration energy crises would be most relevant for the current crisis. In 2011, an earthquake and tsunami struck the eastern part of Japan, putting several large

nuclear and thermal power stations out of service for an extended period. In Brazil, which relies heavily on hydropower, energy-rationing measures are often necessary during unexpected hydrology and weather events. China faced similar challenges in 2003, Uruguay in 2008–09, and Albania in 2009 and 2013.

- **To date, the interconnected European electricity system has managed to cushion power sector consumers in several ECA and EU countries from rationing or power cuts often associated with historic shortages.** Balancing electricity in a wider geographic area means that shortage in one country can be offset by surpluses in other countries. Regional coordination can expand to the coordination of actions and policies; regional trade; physical infrastructure, such as interconnections; regional purchases; and emergency collaboration, extending the limited reach and scale of individual ECA countries.

- **In the short term, ECA's electricity crisis response should focus on emergency generation capacity and the availability of existing units.** In addition to a country's long-term electricity expansion plan, there are often short-term opportunities to improve the performance of existing power generation assets. They include improving maintenance and repairs on existing generation systems and reducing losses in electricity transmission and distribution networks.

Importing ECA countries (Albania, Croatia, Georgia, Moldova, North Macedonia, Poland, Romania, Serbia, Türkiye, and Ukraine) can mitigate the impact of supply shortfalls through gas supply measures, such as the following:

- **Prioritize sourcing natural gas from alternative suppliers, and expedite ongoing projects, as countries did during the 1970s oil crisis.** Regional opportunities include imports from Azerbaijan, Qatar, the United States, and West Africa. Some ECA countries—including Azerbaijan, Croatia, Kazakhstan, Romania, Turkmenistan, and Uzbekistan—could increase domestic gas production. However, the new natural gas supply for most ECA countries is limited by existing pipelines and LNG infrastructure. In the short term, ongoing gas infrastructure projects—such as proposed LNG terminals in Croatia and Türkiye, the Greece-Bulgaria gas interconnector, and the Romania Black Sea gas platform—could be expedited. To decouple from Russian gas imports, Poland is now finalizing the Baltic Pipe, to bring gas from Norway.

- **Optimize gas system operations and maximize storage levels.** ECA countries should optimize gas system operations by removing infrastructure bottlenecks, including reverse flows, and maximizing gas storage levels, something many countries are now doing. Natural gas storage can secure flows during peak demand; however, it is not a long-term replacement for piped imports. In the EU, total storage capacity represents only about 20 percent of annual consumption, and 78 percent of storage capacity is concentrated in only six EU countries. The average gas storage capacity in ECA countries is even lower than the EU average. Within the region, Ukraine has the largest gas storage capacity equaling 33 billion cubic meters (bcm) (the third largest in the world, after the United States and Russia, equivalent to 30 percent of total EU storage capacity). Türkiye's gas storage capacity is much lower, at 6 bcm.

- **Even with storage 90–95 percent full, if Nord Stream 1 remains closed, several EU and ECA countries could face gas disruptions in the second half of this winter season**. EU gas storage levels were at 88 percent full, while the Ukraine gas storage at 30 percent full as of September 28, 2022. For this winter, gas storage is being filled at historical high natural gas prices, unaffordable to most EU and ECA consumers and firms. For the winter season of 2023–24, there is even more uncertainty about how countries can maximize and utilize storage levels.

- **Improve gas security.** Countries can update the security of gas supply definitions to include dependence on a single supplier and a single technology (pipelines) to prepare for supply shocks. The EU security of gas supply regulation (N–1 formula) for the EU does not cover the disruption in the current crisis, as it requires sufficient gas infrastructure in the event of disruption of the single largest gas infrastructure, not the largest supplier nor the largest technology.

- **Invest in new gas system flexibility tools, such as new storage capacity, and alternative gases, such as biogas and hydrogen.** Several countries, including Bulgaria, Poland, Serbia, and Türkiye, are increasing their gas storage capacity. Serbia recently announced new gas storage capacities of 1 bcm and 0.65 bcm by 2023; Bulgaria announced 1 bcm of new gas storage capacity by 2024. Additional flexibility can also come from floating LNG terminals deployed in the ECA region, such as the only floating LNG capacity serving the Western Balkans, which is located in Croatia with 2.9 bcm capacity, being extended to 6 bcm.

Government interventions to offset the impact of the energy crisis on tariffs and utilities were required in most past crises and the current crisis is not an exception; the energy crisis is an opportunity to revisit and rationalize existing tariff structures, for instance to better target subsidies towards the poor and vulnerable and align tariffs with the consumer price index. The impact of the current crisis on ECA consumers and utilities will highly depend on the existing tariff-setting frameworks in place in every country, and the structure of the gas and power sectors: liberalized, separate and legally independent generation, transmission, and distribution companies as well as power market operators. The severity of impacts on utilities will depend on utilities' commercial contracts, cost structure, degree of leverage, availability of cash, and borrowing space. As of 2022, many ECA utilities are still affected by and are recovering from the financial distress caused by the reducing consumption during the pandemic and the increasing market prices that followed. There is a risk that should needed tariff reforms be significantly delayed as a result of the price shock, with further deterioration of the financial sustainability of utilities, leading to further under-investments, and making it more difficult to achieve cost recovery in the future.

Good-practice policies to save energy and energy efficiency in a crisis

3.2

Many no-regrets energy-saving options could reduce short- and long-term gas and electricity demand in ECA countries, which are much less energy efficient than the EU 27.[1] High prices induce reductions in demand, although the short-term price elasticity of energy is very low because of a lack of alternatives and investment barriers for energy efficiency. For this reason, price signals should be balanced with public energy-saving campaigns, quotas, and rationing policies for electricity and gas users. The balancing needs to consider the impact of quotas and rationing on industrial production, jobs, and GDP.

1. ECA countries are among the most energy intensive (energy use per unit of GDP) in the world, with Uzbekistan, Bulgaria, Belarus, Bosnia and Herzegovina, Moldova, Tajikistan, Kazakhstan, Serbia, Russia, Ukraine, the Kyrgyz Republic, and Turkmenistan among the highest (50–250 percent higher energy intensity than EU-27 countries).

Importing ECA countries must prepare for gas shortages and put in place emergency plans to mitigate the most severe economic impacts through public communication campaigns and prioritization of gas consumer groups. In July 2022, the European Commission accepted the EU–level gas rationing plan, which includes a 15 percent reduction in gas consumption in a crisis situation. The EU plan is directly applicable to Bulgaria, Croatia, Poland, and Romania. All medium- and high-risk ECA countries would benefit from a similar policy. Harmonization of emergency planning actions across neighboring countries is recommended.

In importing ECA countries, quotas for electricity and gas can reduce demand in a crisis while giving flexibility to consumers on how to do so. Price and rationing mechanisms can be used simultaneously. To be efficient and cost-effective, rationing must incentivize consumers to reduce their lowest-value consumption. A useful principle is to assign each customer a quota, as Japan did after Fukushima. If consumption exceeds that quota, a financial penalty is imposed. If consumers use less than the quota, they can receive a bonus. In Brazil in 2002, 91 percent of households changed consumption habits during rationing, and 65 percent maintained savings in the longer term, resulting in a 20–25 percent reduction in annual energy use (Maurer, Pereira, and Rosenblatt 2005). These savings allowed industrial production to grow and GDP to remain roughly stable. Rationing saved an estimated 1.0–1.5 percent of GDP.

In all ECA countries, the energy crisis is likely to affect heating, which accounts for 30 percent of energy demand. Most district heating utilities rely on gas or coal. Major price increases and supply disruptions are projected for both fuels. Some low-risk countries (for example, Central Asia, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Kosovo, and Montenegro) may see limited impacts. Others (including EU member states, Georgia, Moldova, North Macedonia, Türkiye, and Ukraine) are at high risk of adverse impacts. In the short term, energy savings are more feasible than fuel switching for larger heating systems, but some smaller-scale options (such as heat pumps) can be implemented in the near term.

In all ECA countries, heating systems (including district heating networks, centralized building heating systems, and individual boilers) remain heavily reliant on fossil fuels, often with energy-inefficient infrastructure, poor service levels, and high subsidies. Globally, buildings consume about 30 percent of energy. In ECA, about 60–75 percent of building energy use is for space heating. ECA's high share of heating demand

is exacerbated by the inefficient building stock and district heating networks. Most buildings in the region are more than 40 years old, and they often consume two to three times more energy than their counterparts in Western Europe. Many countries in ECA also report substantial underheating and much lower overall per capita energy use because of high levels of energy poverty and affordability. The current crisis is already causing many households to backslide into poverty and revert to dirtier fuels (such as coal and firewood).

Importing ECA countries can mitigate the impacts of the energy crisis by saving energy, which can ease demand and improve affordability *this winter*, by taking the following actions:

- **Reform energy subsidies so that they target the poor and vulnerable.** Broad energy subsidies will lead to high fiscal pressures and encourage more consumption. The energy price crisis is an opportunity to revisit and rationalize tariff structures.

- **Launch awareness and behavior change campaigns on energy conservation.** These campaigns should include measures households can take to lower energy use, such as lowering the thermostat by 1°C–2°C, resealing windows, taking shorter showers, and turning off unused lights. After Fukushima, Japan's national energy savings campaign, combined with rationing and quotas, reduced energy use by 15 percent (IEA 2011).

- **Promote short-term energy-efficiency measures.** Financing, subsidies, information, and other mechanisms (such as bulk purchases) can support building renovations, appliance replacement, and fuel switching (replacing old heating appliances, adding insulation/new windows, and promoting heat pumps). These efforts can be complemented by online trainings for energy auditors, designers, and installers on applications for heat pumps.

- **Introduce demand response schemes.** In the short term, demand response programs reduce electricity capacity constraints by utilities issuing a call to reduce consumption for larger customers or households, who can reduce energy use, shift use to off-peak hours, or use onsite generation. An example is the Flex Alerts system triggered by the California Independent System Operator in August-September 2022, which

saved over 4 percent of peak demand by calling on the public to adjust thermostats and turn off appliances and lights during peak hours.

- **Introduce fiscal measures and standards to support energy efficiency and cleaner heating.** These measures can include incentives for building renovation and cleaner heating appliances (for example, insulation, windows, and heat pumps); the removal of subsidies and/or the introduction of new taxes for inefficient or dirty heating (for example, coal and gas boilers, low-efficiency appliances, and coal); and strengthened efficiency standards, including bans on very inefficient equipment.

3.3 Good-practice policies to accelerate clean energy in a crisis

This crisis provides an opportunity to harness the cost competitiveness of renewable energy and improve energy security and sustainability. Price increases in all fossil fuel technologies increase the cost competitiveness of renewables. Countries can streamline power plant permitting and licensing; expedite new auctions for renewable energy; increase distributed energy resources (for example, rooftop solar PV) and energy storage; and consider piloting emerging technologies, such as hydrogen. Electricity supply-side diversification policies include (a) improving the efficiency of generation and transmission; (b) rehabilitating existing generation, such as delaying decommissioning of power plants (for example, Germany delayed decommissioning of nuclear power plants); (c) expediting ongoing renewable energy projects; and (d) signing new contracts or providing subsidies for clean energy, including low-carbon hydrogen. To avoid risks of lock-ins, these policy measures must result in no new investments in fossil fuel technologies, as they did in the 1970s.

To spur green energy investments and maintain the reliability of power systems with increasing shares of variable renewables, regional electricity markets play an essential role in providing price signals and the ability to trade close to real-time for all stakeholders. Solar and wind producers and utilities need short-term markets to offset their long-term positions in close to real-time. Trade is also increasingly essential for hydro

producers because of climate change. The 1970s oil crisis led to a significant increase in long-term energy contracts, something to be avoided as much as possible during the current crisis. Acknowledging the importance of markets and price signals, the European Commission has minimized interventions in essential electricity and gas market mechanisms (box 3.1).

Energy efficiency should be promoted economywide to reduce the impact of higher energy prices in the upcoming years. Policy makers could encourage energy efficiency in factories and businesses to ease the impact of higher energy prices and help them increase their competitiveness by investing in new equipment, optimization of industrial processes, automation, alternative fuel sources, and non-capital measures (by improving operations and maintenance and energy management and shifting production hours). Governments can also accelerate building renovation and efficient heating upgrades by increasing incentives for national-scale building renovations and cleaner heating systems, accompanied by bulk purchase schemes; innovative financing (for example, on-bill financing and leasing); and access to credible information and know-how. World Bank–supported public building renovation programs (in Bosnia and Herzegovina, Kazakhstan, Montenegro, North Macedonia, Poland, Serbia, Türkiye, and Uzbekistan, for example) could be scaled up and expanded to the residential sector. Energy-efficiency and related agencies should be resourced to design and deliver energy-efficiency programs at scale. They should be able to assess and formulate conducive policies, collect and analyze market data, develop strategies to promote behavior changes, design innovative financing schemes, implement programs, and evaluate and adjust programs.

Governments should develop sustainable heating strategies and roadmaps. The acute exposure of the heating sector to gas and the high dependence of heating on fossil fuels will require governments to develop sustainable heating plans and programs. These programs should help transition viable district heating networks from gas and coal to low-carbon heating fuels (sustainable biomass such as wood chips or pellets, geothermal, solar heating, biogas, and industrial waste heat) through resource-mapping exercises. District heating systems that are not viable or do not have access to affordable, cleaner heating resources may have to be phased out. At the household level, traditional heating will have to be phased out in favor of renewable energy and electricity (for example, heat pumps).

BOX 3.1

Navigating EU energy market interventions

Government interventions in liberalized markets to reduce volatility or price levels are not uncommon in an energy crisis, but such interventions carry risks that need to be carefully evaluated. Since the summer of 2022, several countries in the European Union, including Belgium, France, Italy, Greece, Portugal, and Spain, have called for a decoupling of gas and electricity prices.

Historically, wholesale natural gas price caps and wholesale electricity price caps have reduced supply, often resulting in rationing and rollover effects on utilities because of tariff deficits. In 2022, Portugal and Spain implemented gas price caps. The impact on supply was limited, because their isolated markets have significant supply-side flexibility because of their extensive gas import infrastructure. The connection of Portugal and Spain with the European electricity market through France is limited; this measure is not expected to distort the regional European market. Instead of a wholesale price cap, the European Commission announced on September 14, 2022, a temporary revenue cap of €180 megawatt hours (MWh) for nuclear, lignite, and renewable power producers; any revenue above this level will be used to alleviate the impact of high energy prices on consumers. Ongoing implementation faces challenges in many countries (for example, different windfall profit taxes were already implemented ahead of this guidance).

According to credit rating agencies, the liquidity issues facing European utilities (which can lead to bailouts and nationalizations) are less likely to lead to longer-term creditworthiness consequences, because European Commission interventions (such as the €180/MWh cap) support conservative business plans for clean power producers. In September 2022, two types of utility bailouts were the most common in Europe: (a) gas or electric utility bailouts, which caused a rise in the cost of gas or power and the inability to pass the increases through to consumers, and (b) bailouts in response to the liquidity crisis of power generators, caused by the increased collateral requirements for derivatives trading.

The European Commission is also working on a complementary transactions-based price benchmark that more accurately reflects the market for gas imports, with possible consequences for countries in Europe and Central Asia (ECA). In September 2022, there was no comprehensive database reflecting the prices and volumes of gas imports into the European Union. Proxies, such as the price of gas already in the pipeline network ("entry-paid" gas), were therefore used. These proxies are not representative of supply and demand conditions in international gas markets. The majority of liquefied natural gas (LNG) imports into the European Union and ECA are linked to prices at European trading hubs that are no longer suitable proxies for the broader LNG market. Recently, these prices have consistently been higher than the gas price on international markets.

The impact of these evolving EU policies on ECA countries will vary and needs further assessment, but the impact will be highest in countries with high -level coordination with EU energy markets.

4 Policies for protecting vulnerable households

The 2022–23 crisis presents a more severe challenge than other crises and requires new ways to think about the role of social assistance that goes beyond support to typical beneficiaries. The crisis of surging energy prices will push many households into poverty. In addition, the extreme magnitude of this energy price shock could make it difficult or impossible for many nonpoor households to keep their homes warm.

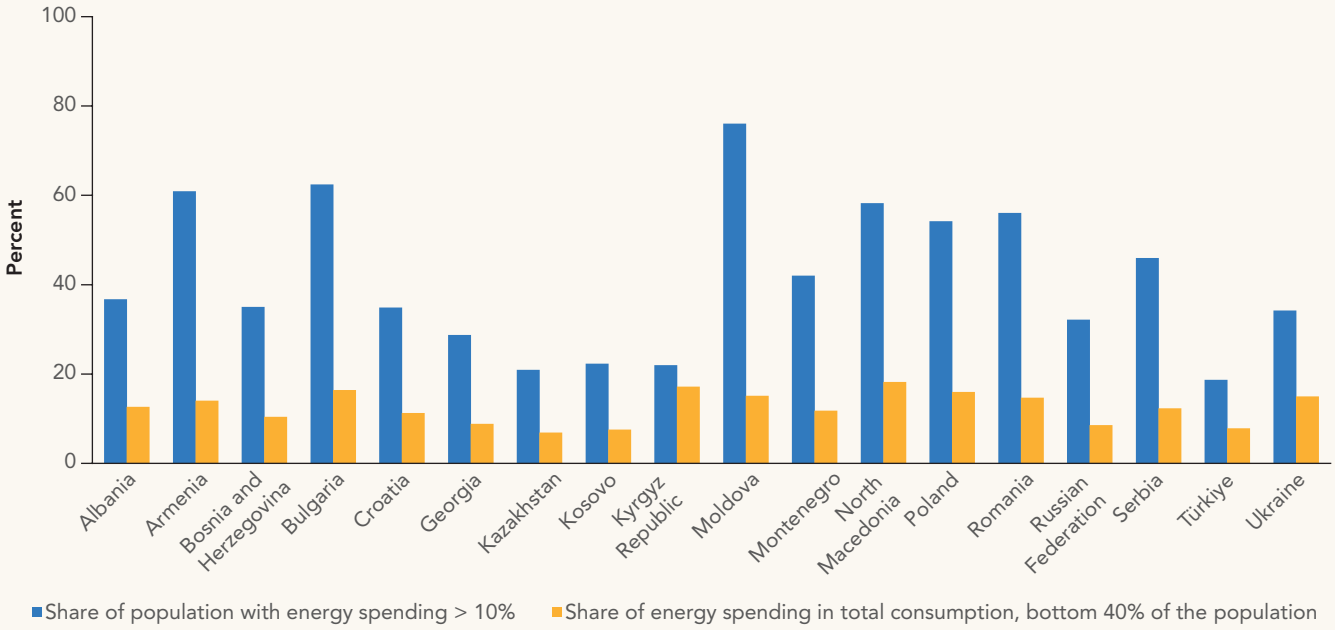
Energy poverty is likely to rise. Expenditure on energy is higher in ECA than in other regions. In many countries, the average share of spending on energy among the bottom 40 percent of households by income (B40) was well over 10 percent of their income even before the current crisis (figure 4.1). Sharp rises in energy costs will increase the number of people who pay more than 10 percent of their income on household energy costs, one definition of energy poverty. Energy poverty is already high in the region. The low elasticity of energy consumption prevents households from adjusting their consumption or easily substituting sources of fuel. Households using natural gas or electricity for heating at home or gas-fired district heating are especially vulnerable to price shocks this winter.

Health and well-being will be adversely affected. Evidence based on excess winter deaths highlights the health risks of people, especially young children, and the elderly, living at low indoor temperatures. Health problems will increase the burden on health systems.

The energy crisis may cause substitution toward more polluting fuels and inefficient energy consumption. Households struggling to pay for

FIGURE 4.1

Household energy spending as a share of total expenditure and percent of energy-poor households in countries in Europe and Central Asia (percent)



Source: World Bank staff estimates and imputation based on the latest available household budget survey for each country.
Note: The survey data were harmonized to make fuel and total consumption aggregates comparable across countries. Survey years range from 2015 to 2020.

heating in rural areas may switch to more polluting sources of heating fuel when energy poverty increases. Ill-designed social support measures introduced in response to the energy cost shock could mute the role of market prices or even subsidize the consumption of cheaper, dirtier inefficient energy.

In the short term, many ECA governments will have no option but to scale up social assistance. A critical social protection challenge in ECA countries is ensuring sufficient coverage and adequate energy assistance to those who need it the most. Few countries in the region have targeted energy assistance. In countries where such assistance programs exist, they are inadequate in coverage and amount provided, as they are often tied to the recipiency of existing anti-poverty programs. Going into the heating season, the impulse in many ECA countries is to extend benefits to the entire population by capping prices below cost-recovery levels or to support a narrow group of formally defined poor households. Price controls and finely targeted compensatory mechanisms represent two extremes. Price controls provide universal support, which is thus thinly spread out and expensive. Finely targeted support lacks the scale to cushion the shock that is affecting the B40. While utility rationing should be avoided, in cases

of interruptions of energy or heating provisions, governments could follow the protocols of public service obligations that define the priorities of energy and heating delivery to the most vulnerable groups of the population (elderly, households with children, and disabled) (Energy Community Secretariat 2020).

ECA countries should aim for social assistance that is adequate in the level of support, adequate in coverage (inclusive of the bottom 20–40 percent of the population by income), and targeted, scalable, fiscally prudent, and market oriented. Ukraine has a comprehensive energy assistance program and the largest fiscal allocation relative to GDP in the ECA region. It effectively reduced energy poverty by combining the elimination of a general energy subsidy in 2015 with a scaled-up, means-tested energy assistance program (box 4.1).

BOX 4.1

Navigating the Ukrainian energy crisis of 2015

In 2015, Ukraine raised the price of natural gas sevenfold, to bring it in line with international gas markets. The price of district heating was also raised. The actions eliminated the implicit subsidies to natural gas consumption, which in 2015 accounted for some 5 percent of gross domestic product (GDP).

To reduce the burden on the population, the Ukrainian government scaled up its means-tested energy assistance program, the Housing Utilities Subsidy (HUS). The HUS covered, at certain times, up to half of all households. Such broad coverage provided political buy-in. The benefit was designed progressively and increased for households that were suffering the most from fuel poverty. HUS became the largest social assistance program in Ukraine, costing about 2.5 percent of GDP at its peak coverage.

Until 2019, the assistance—which is calculated according to a formula based on income and normative consumption—was deducted from a household's bills. In May 2019, the government "monetized" the HUS, providing households a cash transfer instead of a bill discount.

The HUS combines income assessment and the expected volume of energy consumption, which are not typically applied jointly to target vulnerable customers with high energy burden. With HUS, Ukraine managed to transition to a liberalized residential natural gas market in which consumers paid market-based prices. The program helped reduce the energy bill share of household income by as much as 10 percentage points and cut energy poverty in half. One-third of households continued to meet the definition of energy poor, even with the HUS in place, however.

Source: Alberini and Umapathi (2021).

All ECA countries are currently considering some form of social support. There is a risk of governments mobilizing unsustainable, insufficient, and inefficient measures. Many of the approaches shown in table 4.1 do not satisfy the criteria for effective energy assistance mentioned above. Some fall into the category of untargeted subsidies, indiscriminately subsidizing energy inputs via price controls that are below cost recovery and providing poorly designed tax reduction that is distributionally regressive and could lead to substandard supply and service interruptions (Timilsina, Sapkota, and Steinbuks 2018); inadequate investment in production, transmission, and distribution infrastructure (McRae 2015); adverse environmental consequences; and fiscal health issues (Coady, Flamini, and Sears 2015). Explicit subsidies for natural gas and electricity already exceed 3 percent of GDP in Armenia, Azerbaijan, Bulgaria, Georgia, Kazakhstan, the Kyrgyz Republic, North Macedonia, Russia, Tajikistan, and Ukraine (Di Bella and others 2022). The current crisis is forcing more countries to introduce across-the-board energy subsidies, with the attendant risk of increasing the fiscal burden and incentivizing households and firms to revert to (or lock in) fossil fuels. Responding to this crisis requires governments to consider the above criteria in choosing the appropriate crisis response options.

Even if existing social assistance is scaled up, it will be insufficient to cushion the shock. Safety nets should be expanded to cover "nonstandard" beneficiaries with incomes above the poverty line who may be unable to keep warm at current prices. Additional measures are needed to share the burden between the energy sector and households. This burden-sharing

TABLE 4.1

Types and examples of social assistance support for mitigating energy price shock

Type of transfer	Beneficiaries	Examples
Targeted	Standard	Top-up of categorical or means-tested poverty benefits
		Social tariffs or utility bill subsidies
	Nonstandard	Energy poverty benefits
Untargeted		Price controls, caps, and tax discounts
Hybrid		Dual pricing (line tariffs)

Source: World Bank.
Note: Standard beneficiaries are defined as existing beneficiaries or beneficiaries who are easily identifiable via social registries or existing legislation that defines eligibility. Energy poverty benefits target low-income households that cannot heat their homes without incurring a prohibitive cost relative to their income. These households are not the standard beneficiaries that typical safety nets are tooled to support. Block tariff/dual pricing refers to subsidizing an initial block of energy consumption.

arrangement could come from consumption-smoothing assistance, firm-level support, and/or pricing regulation to reduce excessive profits.

Preventing a decline in well-being from the energy shock will depend on the scalability of safety net systems. A challenge to address for social protection systems in ECA is their limited administrative and fiscal capacity to scale up quickly. Administrative capacities include the ability to identify and verify households in need, scale up the distribution of payments, and control fraud. When fiscal limitations are tight and administrative capacity weak, governments are tempted to adopt price controls below average cost, because of the ease of implementation. Such measures are fiscally unsustainable and produce mixed results, as the cushioning effect of the policy is diluted over a large base of beneficiaries, leading to prohibitively high costs but inadequate support for the most vulnerable.

The fiscal resources needed for fully compensating the bottom 20 percent (B20) of households using targeted measures are sizable but not prohibitive for many countries (Perry, Black, and Vernon 2022). Targeting the B20 to protect them from the 2021–22 price surge costs would cost 0.4 percent of GDP on average (Perry, Black, and Vernon 2022). Most ECA countries have medium fiscal capacity and could sustain such an increase in spending during 2022–23. Ukraine is an exception (see box 4.1); its flagship energy assistance program cut the rate of energy poverty in half but at a price tag of 1.0–2.5 percent of GDP in 2016–18). The Ukrainian experience suggests a need not just to cover the B20, but also to extend support to B40 households. Despite the high cost of covering B40 households, the Ukrainian approach was more cost-effective than price controls. The economic benefits of targeted support go beyond fiscal health; they do not undermine energy sector competitiveness as general subsidies do and are less encouraging of wasteful energy consumption behavior.

What social protection options do ECA countries have? The extent and type of social protection response will also depend on administrative capacity and fiscal space. Not all countries have advanced administrative, data exchange, and targeting capacities for quickly scaling up well-designed energy poverty assistance programs. Moreover, countries with high macro-fiscal stress risk have a lower fiscal capacity to expand safety nets.

ECA countries with high administrative capacity could consider a tapered benefit approach that varies the intensity of support by income and household energy use characteristics. In this approach, assistance is

provided to a broader group (the B40) that includes low- and lower-middle-income households. The benefit could be designed to maintain the ratio of costs of energy consumption to incomes at a level that prevents energy poverty. This approach combines information about household resources and an allowance for a basic minimal volume of energy consumption (normative consumption) that depends on household characteristics and the type of fuel used. When the ratio of basic energy allowance relative to income exceeds a certain threshold, it triggers eligibility and the corresponding value of the assistance. The remaining benefit parameters determine the level of mandatory out-of-pocket payments based on a sliding scale that increases with income. Tapered assistance can be provided as cash via the banking sector, with provision for help for households that use solid fuels, especially in rural areas. Such an inclusive design could achieve good targeting performance with appropriate targeting and administrative capacity.

In countries with high administrative capacity and high macro-fiscal stress risks, a tapered benefit that varies with income and housing conditions could be optimal. This approach could achieve high coverage, adequacy, and targeting. If a country has a strong targeting system, social tariffs could also be an option. However, they would require coordination between the welfare agency and utility companies and represent a more complex instrument without advantages over well-designed energy assistance provided in cash. Given the scale of the crisis, a key principle for all countries is to incorporate targeting features that minimize exclusion errors, even at the cost of some inclusion errors.

Countries with low administrative capacity and high macro-fiscal stress risk could scale up existing programs and provide top-up benefits to standard beneficiaries, such as the poor and categorical vulnerable groups the system already targets. Doing so would result in better adequacy of protection for the most vulnerable groups, although it would not fully cushion the impact of energy poverty. A lifeline tariff paired with an energy benefit top-up to existing benefits could be an option toward that goal.

For countries with low administrative capacity and low macro-fiscal stress risk, a well-calibrated lifeline tariff combined with additional measures that target the poorest could be used. Restricting price subsidies to the initial block of consumption is less costly than across-the-board

price subsidies and preserves the inclusive social protection feature. Lifeline rates are easy to implement and involve minimal administrative costs, but they may be regressive. They can also distort the behavior of utilities and consumers, as the price paid would not reflect the marginal cost of the service. Lifeline tariffs can benefit richer groups while excluding poor households. Authorities could use existing targeting systems to provide additional assistance for vulnerable groups and expand the generosity of existing programs via heating season top-ups. That assistance could be provided as flat-amount transfers or cash benefits that vary by eligibility bands.

Many households may require support only to manage energy bill volatility. To protect nonpoor households, governments could consider subsidizing energy consumption-smoothing that spreads the impact of short-term price surges over several years. This kind of mechanism can be provided at the level of the utility or energy service provider (for example, gas, electric, or district heating provider) by amortizing the costs of energy during energy price spikes over a longer period. Such interventions could take the form of price pass-through and billing cycle regulations designed to smooth the transmission of price shocks to consumers, spreading the energy costs over one or more years. This type of intervention allows the high utility costs in the winter months to be paid for throughout the year. In combination with energy poverty assistance, such a hybrid approach provides a better way of letting the markets drive prices and target public resources than untargeted approaches, such as controlling prices.

The net effect of government policies will depend on how the impact is distributed and who bears the burden of protecting households. There is a case for policies that support arrangements that equitably distribute the burden across private firms, SOEs, and households. This raises the issue of which firms and households should receive protection and how much protection they should receive.

5 Policies for supporting firms

5.1 The impact of high energy prices on firms

The impact of high energy prices is highly heterogeneous across firms, sectors, and countries. Energy costs amount to 11 percent of total costs for the average firm and 6 percent for the median firm across ECA countries, according to World Bank Enterprise Surveys data. However, this average hides significant differences between and within sectors. For example, the cost of energy ranges from 5 percent for the manufacture of radio, television, and communication equipment, to 21 percent for land, water, and air transport. Differences between firms within industries are driven by factors such as management, organization, and technology adoption. Across countries, firms' energy use can also be influenced by a country's energy policies, local energy resources, energy pricing, and other factors. In ECA, the share of energy in firms' costs ranges from 7 percent in Czechia and Croatia to 18 percent in Albania and 22 percent in Kosovo. Differences between firms are even larger, with the share of energy costs in total costs ranging from 2–3 percent to 44 percent in countries with the highest energy dependence.

Firms respond to an increase in energy prices in different ways. An increase in energy prices can lead to an increase in prices (pass-through), an increase in efficiency (upgrading), operational changes (for example, reducing production, shifting production to off-peak hours, increasing self-generation capacity, or outsourcing energy-intensive processes), and/or a reduction in profits. If profitability becomes low, firms may decide to decrease production or temporarily shut down. The specific response

depends on a number of factors. The ability of firms to increase prices depends on the level of competition, the firm's market power, and the demand elasticity of consumers. Marin and Vona (2021) and Cali and others (2022) suggest that an increase in energy prices can have significant effects on spurring energy efficiency, but the improvement in energy efficiency may depend on the scope for upgrading and the distance from the efficiency frontier. It can also be impacted by a firm's access to newer technologies and capital. The ability of a firm to absorb the cost shock and reduce profits depends on the initial level of its profitability: the larger the profit margin, the more a firm will be able to accommodate the price shock (Rentschler and Kornejew 2017; Draca, Machin, and Ven Reenen 2011).

5.2 Policy recommendations for when and how to protect firms from high energy prices

Supporting firms should be done carefully. Governments are quickly putting together packages to support businesses, and there is a good case to be made that even if the price surge is short lived, it is important to support viable businesses that could otherwise fail. However, governments need to be careful to provide support schemes that *provide incentives for energy savings and do not introduce distortions*. At the country level, it is important to ensure that any fiscal support extended to firms remains consistent with the level of macro and fiscal stress risk faced and the firm's exposure to supply risk. At the firm level, the key aspects to consider are the levels of efficiency and exposure to energy costs or dependence on energy.

Principles for supporting firms

Policy makers should consider the following principles in crafting policies to support firms:

1. *Target support.* **All countries need to target and differentiate among firms to ensure efficient government support. Doing so is crucial for countries with higher macro and fiscal stress.** *Countries that are under higher macro and fiscal stress should put in place clear mechanisms that target viable firms.* Viability requires considering solvency and vulnerability. Vulnerability could be proxied by the median level of energy as a share of total costs for firms in a specific sector and of a certain size. For viable firms, support should target easing liquidity challenges and address solvency risks.

2. *Prioritize efficiency and savings.* **Support should be contingent on savings through energy efficiency efforts.** *Countries with higher macro and fiscal stress, especially countries with higher energy supply risk and those that may face rationing,* should condition support based on measurable savings and improvements in energy efficiency. The target for energy efficiency should be driven by firms' efficiency levels relative to average sectoral efficiency, with inefficient firms required to make greater efforts to receive support. This conditionality would help avoid distorting and reducing the incentives to reduce energy costs, which would be key during the crisis and could help reduce greenhouse gas emissions and improve energy efficiency in the longer term.

3. ***Put jobs at the center.*** *For countries with higher energy supply risk and those facing rationing,* policy makers should maximize the returns on investment in terms of potential saved employment per dollar spent. To ease liquidity constraints and prevent layoffs, governments could introduce temporary and partial wage subsidies for the firms most affected by the crisis.

4. ***Make support contingent on efforts to improve energy efficiency.*** This principle is relevant for all countries, especially those exposed to higher energy supply risks and firms with higher vulnerability. To avoid lock-ins into irreversible subsidies, liquidity support should be state contingent and tied to specific levels of energy prices. These conditions would reduce uncertainty for firms about how long support will last and prevent wasteful subsidies when prices decline. Governments should assess the level of energy costs as a share of total costs based on historical energy bills and target firms above a certain threshold.

Policies for supporting firms

Policies to support firms can be grouped into three broad categories:

1. **Policies that support and incentivize energy-efficiency improvements.** Improving energy efficiency should be pursued as a central objective, not only because it will help firms reduce the impact of high prices, but also to be more competitive and achieve the longer-term goal of reducing emissions. Firms respond to incentives to improve energy efficiency. Fuel subsidies distort such incentives, pointing to the importance of avoiding subsidizing prices (Schweiger and Stepanov 2022). To incentivize energy efficiency, governments could offer larger and more established firms fiscal incentives, such as accelerated depreciation for investments in efficient capital equipment, lighting, and insulation. For SMEs, supporting investments in energy efficiency could include grants, vouchers, and/or concessional credit lines that incentivize energy savings, in addition to helping firms at a critical juncture. Policies should also encourage simpler, non-capital measures (improved operations and maintenance, energy management, and shifting of production hours) as these can be done much quicker and without the need for financing. In the short term, these policies are especially important for countries most exposed to energy supply risk; in the medium to longer term, other countries would also benefit from these programs.

2. **Policies that address liquidity constraints.** *Countries with higher energy supply risk that also face higher levels of fiscal stress* to address liquidity concerns while incentivizing energy-efficiency gains could mobilize sustainability-linked loans and credit guarantees. These instruments can incentivize firms' sustainability performance by linking terms and conditions (interest rates, fees, and tenors) to the achievement of predefined targets (for example, improvements in the energy-efficiency rating of buildings and/or machinery owned or leased) without mandating the uses of the proceeds. Sustainability-linked financial instruments have been growing over the past few years, becoming an important segment of the environmental, social, and governance market. Sustainability-linked instruments offer more flexibility than green loans and guarantees, allowing firms to finance other working capital or investment needs. Countries facing higher macro and fiscal risks will have to rely on financial instruments rather than fiscal instruments and grants.

3. **Policies that address longer-term solvency issues.** *Firms facing higher exposure to energy costs and countries exposed to higher energy supply risk* should design targeted recapitalization programs to ensure the long-term solvency of viable firms. With many firms exiting the pandemic with over-indebtedness and undercapitalization in a high interest rate environment, the current energy crisis will only compound solvency risks among otherwise viable businesses, especially firms with higher vulnerability because of their exposure to energy costs. Governments should consider programs aimed at recapitalizing the corporate sector to complement temporary liquidity schemes. The selection of policy instruments will be driven by the size of the firm and the development of capital markets in the country. Large firms could benefit from direct equity injections; quasi-equity instruments providing capital relief under national accounting and insolvency regulations might be appropriate for SMEs. Grants or subordinated/convertible loans may be the only option for micro firms. In all cases, incentives for the private sector should be designed to avoid privatizing gains and socializing losses, and safeguards should include robust ex ante verification mechanisms and ex post risk-based audits.

Firms whose failure could cause a disruption to a community or the wider economy may warrant support. Large firms that could hurt multiple suppliers and lead to further business closures should be considered for special assistance if they are at risk of defaulting on their debt because of a liquidity crunch. Special consideration should also apply to firms that play a critical role in importing and distributing energy. To maintain their solvency, these companies should be allowed to pass on cost increases to end-users on otherwise fixed-price contracts (governments could shield vulnerable households with targeted income support). Energy companies may also need liquidity support to meet margin calls. During periods of interruptions of energy supplies or blackouts, priority support for firms and organizations should be determined by the regulations (public service obligations) specified in the countries' energy laws (Energy Community Secretariat 2020).

6 Short- and longer-term recommendations

Short-term policy recommendations 6.1

Improving energy security

Energy policies should be guided by the principle of being transparent, fully budgeted, and time bound, preserving price signals, and avoiding incentivizing the lock-in of fossil fuels. Interventions should be transparent, fully budgeted, and time bound. As price signals are critical, energy consumers, not taxpayers, should bear most of the financial burden. Governments should therefore consider recovering funds over a certain period, at least partially. Price signals will also incentivize new energy investments and infrastructure in a competitive manner. Finally, short-term interventions should not incentivize households and firms to lock in fossil fuels.

For the upcoming winter, ECA countries at medium to high energy risk should launch public campaigns to save energy, boost energy efficiency, and implement quota/rationing plans. To be efficient and cost-effective, rationing should be designed to provide incentives for consumers to reduce their lowest-value consumption. Simple measures like reducing the temperature, resealing windows, adding insulation, cleaning radiators, and taking shorter showers require minimal investment and have immediate impacts.

Securing alternative gas and electricity supplies should be a priority for ECA countries at medium to high energy risk, to mitigate supply-side shortages (and resulting price hikes). Measures can include increasing the capacity and efficiency of domestic supply; increasing storage; and using alternative fuels, such as biogas and hydrogen.

All ECA countries should expedite investments in clean energy. The economic and business case for energy efficiency, renewable energy, and energy storage is stronger than ever as they are affordable, domestic, and scalable. These investments can reduce dependence on imported fuels, increase a country's resilience, and contribute to existing climate commitments. While security benefits of energy trade remain high in ECA, the economic and business case for energy efficiency, renewable energy, and energy storage is also stronger than ever as they are affordable, domestic, and scalable.

Protecting vulnerable households

Social assistance should be guided by the principles of being adequate in the level of support, adequate in coverage (inclusive of the bottom 20–40 percent of the income distribution) and targeting, scalable, fiscally prudent, and market oriented. In many countries, scaling up existing social assistance will be insufficient to cushion the shock of high energy prices. Safety nets should be expanded to cover the "nonstandard" beneficiaries with incomes above the poverty line but who may be energy poor and unable to keep warm at current prices.

The extent and type of social protection response depend on fiscal stress risk and administrative capacity. ECA countries with medium to high fiscal stress risk and medium to high administrative capacity should consider a tapered benefit approach, which varies the generosity of support by income and energy use profile. Countries with medium to high fiscal stress risk and low administrative capacity should scale up existing programs and provide top-up benefits to standard beneficiaries such as the poor and categorical vulnerable groups that the system already targets as vulnerable populations.

Protecting firms

Support for firms should be targeted, contingent on increased energy efficiency, keeping jobs at center, and making government support state contingent to reduce policy uncertainty. Supporting firms during the energy crisis is important but should be done consistently with the level of macro and fiscal stress risk faced and the level of exposure to the energy supply risk. Governments must be careful to provide support schemes that do not introduce distortions and provide incentives for energy savings.

Government support should provide incentives for energy efficiency and address liquidity and longer-term solvency constraints where

needed. Improving energy efficiency should be pursued as a central objective in providing support because it will help firms reduce the impact of high prices and achieve the longer-term goal of reducing emissions. In countries with higher energy supply and fiscal stress risks, government support may need to include liquidity and solvency support for viable firms. Special attention may also be required to deal with systemic firms.

Long-term policy recommendations 6.2

Fiscal policies play a critical role in cushioning the impact of the energy price shock in the short term; over the medium term, they need to be complemented with structural reforms. These reforms should ensure increased energy efficiency and the transition to greener energy sources. An accelerated transition to low-carbon energy is needed to reduce dependency on fossil fuels. Effecting this transition will require additional investment in electricity grids; cleaner energy sources, including renewables; and improved energy efficiency. Climate-smart regulatory frameworks, adequate incentive structures, and stronger land use regulations are needed to achieve these objectives.

Over the medium term, the large change in relative prices, tightening of energy supply, and energy security concerns could unleash a new wave of technological progress. It would help diversify away from gas in Europe and fossil fuel imports from Russia and increase energy efficiency. Spillovers from related research and innovation to decarbonization and greater energy efficiency may improve potential output in the longer run.

Coal lock-in should be avoided. Some ECA countries may revert to coal use temporarily because of supply shortfalls (as the EU, the United States, and China have). New investments in coal will not be sustainable and would increase the cost of the energy transition. Permitting new coal investments or expansion of existing ones should therefore be prohibited.

Government interventions in liberalized markets to reduce volatility or price levels carry risks that need to be carefully evaluated. Historically, wholesale natural gas and electricity price caps have exacerbated supply gaps, often resulting in rationing and rollover effects on utilities because of tariff deficits.

In all ECA countries, interventions to ease the impact of the energy crisis should not adversely affect the financial position or creditworthiness of utilities. The creditworthiness of utilities is essential for energy security and decarbonization. Government interventions may be short term (addressing liquidity) or long term, with implications for long-term retail energy prices.

Energy-efficiency policies and programs should be implemented in all sectors. They include promoting energy efficiency in factories and businesses, accelerating building renovation and efficient heating upgrades, standards, and codes; access to financing; and credible information and know-how. Energy- efficiency and related agencies should be resourced to design and deliver energy-efficiency programs at scale.

6.3 Directions for further analysis

Further analysis could extend the scope of this paper by incorporating analysis of oil, renewables, and all end-use sectors, including transport. A holistic energy system analysis could assess the regional potential of the proposed ECA energy policy measures (supply diversification, energy savings, and clean energy) by 2024 and 2030, the role of different technologies, sectorial policies, and associated financing, investments, and carbon dioxide emissions. A balanced regional ECA analysis (similar to the World Bank's Country Climate and Development Reports) could be conducted using macro and least-cost techno-economic energy system modeling to investigate scenarios spanning different pathways for green growth, energy security, and decarbonization. Deep dives into specific topics—such as the impact of the crisis on ECA tariff reforms, on ECA utilities and SOEs by country, the impact of European Commission rules on individual ECA country clean energy policies, and sustainable heating—could help develop more effective policies.

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