United Nations Development Programme

Moldova

SDG PUSH FRAMEWORK

Unlocking New Pathways to SDG Acceleration

2024

Acknowledgements

The SDG Push Framework **is led by the government** as part of their journey of developing roadmaps to achieve the SDGs in the country through a structured approach to identifying the accelerators.

This SDG Push publication is led by the SDG Integration Team of UNDP, the country office, and a team of national experts. The national experts include a policy advisor, economist, data analyst, and engagement facilitator. We thank several UN agencies for their valuable comments on the design and implementation of SDG Push.

How to cite the Report:
UNDP (2024). Moldova SDG Push Framework: Unlocking New Pathways to SDG Acceleration. New York, NY: United Nations Development Programme.

With generous support from:
Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ), on behalf of Federal Ministry for Economic Cooperation and Development (BMZ).

Moldova SDG Push Framework
Unlocking New Pathways to SDG Acceleration

Table of Contents

This initiative is developed by the UNDP SDG Integration team, in cooperation with Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ), on behalf of Federal Ministry for Economic Cooperation and Development (BMZ) in support of countries to recover forward.

Acronyms

BAU	business-as-usual
CGE	Computable General Equilibrium
EU	European Union
EVIS	Energy Vulnerability Information System
EVRF	Energy Vulnerability Reduction Fund
GAP	Government Action Plan
GDP	Gross domestic product
GDPR	General Data Protection Regulation
HBS	Household Budget Survey
IMG	International Monetary Fund
INFF	Integrated National Financing Framework
MDL	Moldovan Leu
MLSP	Ministries of Labour and Social Protection
MS	micro-simulation
NDS	National Development Strategy
NSAEP	National Social Assistance Electronic Platform
PPP	Purchasing power parity
SAM	Social accounting matrix
SDG	Sustainable Development Goal
TFP	total factor productivity
UNDP	United Nations Development Program
UNSDCF	United Nations Sustainable Development Cooperation Framework

1. Executive summary

The Republic of Moldova has faced multiple challenges in recent years, including a constitutional crisis, economic downturn due to COVID-19, weak governance, limited institutional capacity, an unfavorable business environment, and high emigration rates.

Moldova's reform efforts have been further hampered by the Russian Federation’s invasion of Ukraine, leading to an influx of refugees, straining public services and infrastructure. The macroeconomic landscape deteriorated significantly in 2022, with inflation exceeding 30 percent, widening public deficits, and stagnant GDP growth. These pressures exacerbated pre-existing vulnerabilities, including an inefficient state-owned enterprise sector, ineffective governance, and pronounced energy insecurity due to historical reliance on a single energy source and supplier.

In 2022, the Government of Moldova, with technical support from the United Nations Development Programme (UNDP), piloted an adapted version of UNDP's SDG Push Framework to explore new policy options for addressing development setbacks caused by the pandemic and other domestic and external pressures. The SDG Push process in Moldova, supported by the Ministries of Labour and Social Protection (MLSP), and Economy and Digitalization, aimed to assess policies to reduce energy poverty and vulnerability. It focused on analyzing the impact of current short-term household compensation and how it can be institutionalized for longer-term energy efficiency and Sustainable Development Goal (SDG) achievement.

With UNDP's support, the Government deployed a rapid digital solution, the Energy Vulnerability Reduction Fund (EVRF) platform, to facilitate citizen applications for energy compensation. The EVRF aims to mitigate energy vulnerability, support energy-poor households through short-term compensation and longer-term energy efficiency and raise awareness. The SDG Push process emphasized evaluating the digital system's effectiveness for household registration and leveraging the EVRF's success in reducing poverty and increasing household welfare.

The analysis involved:

1. Assessing the EVRF's impact on energy and income poverty using Household Budget Survey (HBS) data.
2. Using a Computable General Equilibrium (CGE) model to assess the crisis' effects on macroeconomic indicators and explore targeted price subsidies and cash transfer alternatives.
3. Evaluating the Energy Vulnerability Information System (EVIS) digital platform's functionality during household registration for energy bill compensation.

Key findings:

- Energy subsidies under the current EVRF mechanism had strong positive effects on reducing energy poverty, particularly for natural gas users.
- The mechanism significantly decreased income poverty across all vulnerability categories, benefiting high and very high energy vulnerability households the most.
- Elevated energy costs, especially for natural gas, adversely affected GDP, consumption, and unemployment.
- Targeted cash transfers performed more effectively than price subsidies, enabling households to allocate supplementary income according to their preferences.

The SDG Push Framework in Moldova highlighted three key lessons:

1. While the EVRF significantly reduced vulnerability at a time of uncertainty, current support mechanisms cannot fully offset the negative effects of energy price shocks. This necessitates determining the ideal subsidy rate (cash/income transfer) that assists households in sustaining their consumption at pre-shock levels while also encouraging a shift away from natural gas.
2. As a part of Moldova's 2030 Digital Transformation Strategy, the development and deployment of the EVIS platform was a first step to providing equal access to quality public services in health, education, sanitation, and e-government. While the system has provided equal access to all households, the categorization algorithm used to assess the vulnerability of households and the simplification of the registration process may ensure better identification, targeting and enrollment of households in need, including those in lower vulnerability categories.
3. The key challenges that were identified relate to technological and institutional arrangements. These challenges affected data access and quality, highlighting the need for effective data governance measures to ensure timely information for energy vulnerability reduction efforts. Future improvements in EVRF administration lie in developing a data governance framework that defines the roles and responsibilities of various stakeholders involved in the EVRF and outlines the processes and key policies for managing the data. In addition, data quality needs to be a key priority; thus, investing in tools and technologies is necessary to ensure data accuracy, completeness, and consistency.

Future improvements in EVRF administration lie in developing a data governance framework that defines stakeholder roles and responsibilities, outlines data management processes and policies, and prioritizes data quality through investment in tools and technologies.

2. Introduction

The SDG Push Framework is a set of comprehensive and country-specific tools developed by the United Nations Development Programme (UNDP) to accelerate progress towards achieving the Sustainable Development Goals (SDGs). In 2022, the Government of Moldova, with technical support from the UNDP, piloted a scaled-down version of the SDG Push to investigate new policy options to address development gains threatened by the impacts of the COVID-19 pandemic and other domestic and external pressures.

The SDG Push Framework aimed to reimagine and recalibrate how development interventions are planned and implemented to create meaningful progress in sustainable development. The framework was designed to adapt to the unique challenges and opportunities each country faces. It considers individual countries' specific contexts, priorities, and development trajectories. It allows for addressing various constraints and issues countries face to achieve the SDGs.

The framework combines the power of data, state of the art modelling, and finance to enhance the effectiveness of development interventions. By leveraging data and evidence-based approaches, fostering innovation, and mobilizing financial resources, the SDG Push Framework seeks to make interventions more impactful. It recognizes the importance of a participatory approach, i.e., collaboration and partnerships, in achieving the SDGs. It aims to bring together various stakeholders, including governments, civil society organizations, private sector entities, and international agencies, to work collectively towards common goals.

The goal of the SDG Push Framework is to expedite the progress toward achieving the SDGs by providing countries with a comprehensive toolkit and support. It aims to accelerate positive outcomes and make a tangible difference in sustainable development.

This report synthesizes the main findings of the SDG Push Framework in the Republic of Moldova. It provides information and an analysis of the country's socio-economic and political context followed by an overview of development priorities. The second part summarizes the outcomes of the economic analysis of the energy compensation scheme and provides recommendations on how the Energy Vulnerability Reduction Fund (EVRF) can be improved.

Socio-economic challenge and political implications

Moldova is a lower-middle-income country with a GDP per capita of around 30% of the European Union (EU) average in 2020. Despite solid economic performance over the past two decades, Moldova remains one of Europe's poorest countries. Its growth model, reliant on remittance-induced consumption, had become less sustainable before the COVID-19

pandemic due to declining remittances and a shrinking and aging population. Public spending is inefficient and poorly targeted, while private investment and productivity are constrained by an unfavorable business environment and underperforming state-owned enterprises.

In recent years, Moldova has faced multiple crises - the COVID-19 pandemic, the energy crisis, and the Russian Federation invasion of Ukraine. The latter has generated an unprecedented humanitarian crisis, with over 100,000 Ukrainian refugees remaining in Moldova, straining fiscal resources aimed at long-term development priorities. Additionally, Moldova is critically reliant on natural gas imports from Russia, and disruptions are expected to erode competitiveness and household incomes.

Since August 2021, Moldova's reform-oriented government has aligned powers to support an ambitious reform agenda focused on justice sector reforms, good governance, and anti-corruption efforts. However, systemic corruption and weakened rule of law institutions continue to hamper investment and productivity growth.

The energy crisis since September 2021 has had major socio-economic and political implications, with inflation reaching around 34% year-on-year in September 2022, largely due to soaring natural gas prices from Russia. International support, including macro-financial assistance from the International Monetary Fund (IMF) and the EU, and direct budget support from development partners, has been critical in mitigating crises and increasing resilience.

The ‘Europeanization’ of reform

Despite corruption and governance challenges, in June 2022, the EU granted EU candidate country status to the Republic of Moldova, having achieved a positive assessment conducted by the European Commission of political and economic criteria. EU candidate country status marks the beginning of new economic, political, and social transition characterized by comprehensive EU monitoring that will not only reduce the room for corruption but will incentivize decision makers to implement more comprehensive institutional reforms. Currently, with the view to start EU accession negotiations next year, Moldova is engaged in fulfilling the nine policy reform commitments in such areas as justice reform, the fight against corruption, quality public services including by stepping up implementation of public administration reform, public financial management, macro-financial stability, and protection of human rights.

Attaining candidate country status facilitates the expansion of financial support diversification and an increase in non-repayable funds from the broader pool of financial aid provided by the EU. This extends beyond conventional methods such as macro-financial assistance and

other forms of aid. Additional financing sources could help the country tackle the ongoing energy crisis by expanding the social protection system and developing digital platforms that could help build responsive, inclusive, and participatory decision-making processes.

Digitalization at the forefront

The Government of Moldova, through its Programme of Actions, made a bold decision to accelerate digital transformation of the nation by making use of the existing opportunities and exploring a 'whole-of-society' approach, thus ensuring that transformation is inclusive and sustainable. The digital transformation is seen as a cross-cutting enabler through almost all the priorities or areas that can promote transformational change developed for the United Nations Sustainable Development Cooperation Framework (UNSDCF). In particular, the priorities areas are equal access to quality public services in health, education, sanitation, e-government (top priority) and other priorities for which digital transformation is a key enabler.

Energy security has been a long-term challenge for Moldova, and the war in Ukraine made it a critical short-term problem. Digitalization with compensation by the government to reduce the vulnerability of households helped lay a foundation for support to households. In addition, the Government invested in parallel in finding alternative energy sources and improving energy efficiency.

Energy compensation scheme

Research from the UNDP Global Policy Network in 2022 revealed a significant rise in utility prices, with a 105 percent increase in September 2022 compared to the previous year. This surge compelled Moldovan households to redirect funds from essential goods like food, exacerbating the risk of poverty for around 640,000 people, or approximately 35 percent of the population, if the energy crisis persisted. To address this urgent issue, both supply and demand interventions were imperative to alleviate energy poverty and prevent households from sacrificing necessities like food for energy.

As a response, the Moldovan Ministry of Labour and Social Protection, with UNDP's technical assistance, introduced the Energy Vulnerability Reduction Fund (EVRF) through Law 241/2022 in July 2022, effective from September 2022. The EVRF aims to mitigate energy vulnerability, enhance energy accessibility for vulnerable consumers, and promote energy efficiency. The fund finances various measures, including compensations for energy bills and subsidies for energy resource efficiency.

Part of this initiative was the launch of the Energy Vulnerability Information System (EVIS) in October 2022, an online platform facilitating registration and processing of compensation

requests. EVIS implements a differentiated compensation scheme based on households' energy vulnerability, determined by factors like income level, household composition, and heating source. Subsequently, households are categorized into five vulnerability tiers, with their energy tariffs recalculated accordingly to reflect actual subsidies.

During the online registration, data are cross-referenced with official government datasets to ensure accuracy and prevent duplication. By March 2023, over 850,000 households, representing more than half of Moldova's households, had registered for the compensation scheme. Subsidies vary based on vulnerability category and energy type, with the most vulnerable households receiving two to three times more than low-vulnerability households to alleviate financial strain and combat energy poverty.

For more detail on energy use and subsidies per category of vulnerability see Annex I and data challenges see Annex II.

3. SDG Push Pilot: Moldova

3.1 Scoping phase

The development of Moldova's SDG Push began with a thorough review of strategic policy and planning documents. This review aimed to analyze the country's socioeconomic, institutional, and environmental landscape, identifying gaps in achieving the SDGs, evaluating progress, and pinpointing potential interventions to expedite progress towards the 2030 Agenda for Sustainable Development. Additionally, the review identified challenges in data availability, disaggregation, and consistency for monitoring progress over time.

The process of nationalizing the 2030 Agenda for Sustainable Development in Moldova began with mapping and identifying the relevance of SDGs and targets from July 2016 to March 2017. This involved analyzing the correlation between the national policy priorities and the 2030 Agenda, adapting the goals and targets accordingly, and defining the data ecosystem for monitoring and evaluation. Subsequently, the adapted SDGs and targets were integrated into the initial draft of the NDS 'Moldova 2030' in 2018, which underwent revisions to align with changing political priorities and emerging crises.

The Government Action Plan (GAP) serves as the principal policy planning document outlining government priorities and resource allocation. The latest GAP covering the 2021–2022 period amalgamates initiatives aimed at fulfilling sustainable development goals, including international commitments such as the Association Agreement with the EU and the 2030 Agenda for Sustainable Development. Approximately 31 percent of the policy measures in the GAP focus on advancing SDG 16, with varying percentages allocated to other SDGs.

An essential component of the scoping process was the SDG Push Diagnostic Simulator, which utilized machine learning techniques to identify disparities in SDG advancement nationally. This simulator conducted an in-depth analysis of national data and knowledge reservoirs, highlighting critical areas for development. It categorized progress according to the ‘five Ps’ of sustainable development: People, Peace, Planet, Prosperity, and Partnership, with machine learning algorithms revealing the most prominent SDGs referenced in national policy documents.

The national priorities and progress analysis explicitly acknowledged the pivotal role of digital transformation in the country's sustainable development across governance, society, and the economy. Recognizing digitalization as a cross-cutting enabler, the government sought to leverage it to address various priorities, including the ongoing energy crisis. As part of this effort, the SDG Push initiative explored the feasibility of implementing digital-powered energy compensation interventions.

The effectiveness of Moldova’s digital system and social protection, particularly EVRF, emerged as the entry point for the SDG Push initiative. Its objectives include understanding the impact of short-term compensation, informing long-term energy efficiency strategies, and identifying households potentially left behind by the fund, especially concerning digital registration and vulnerability level assignment.

For more detail on the scoping phase see Annex III..

3.2 Modelling

The effects of EVRF on energy and income poverty (micro-simulation).

Given the significance of the residential sector in terms of energy consumption, a comprehensive understanding of households’ energy consumption patterns and choices was imperative. The micro-simulation examined household spending in November and December 2022 withou.t reduced bills to simulate total electricity and gas expenditure based on market prices. It evaluated whether the EVRF reduced energy poverty.

Market prices, obtained directly from energy distributors, were used for simulation. The impact of EVRF on energy poverty was assessed using data limited to November and December 2022 from the Household Budget Survey (HBS). Detailed methodology is described in Annex IV.

It emerged that energy subsidies have strong effects on the energy poverty rate. In the case of gas, the share of very highly vulnerable households in energy poverty increased by 71 percentage points, or 272 percent, and in the case of electricity by 12 percent if the households were not subsidized. An electricity price increase resulted in much lower energy poverty levels than gas price increases. Looking at different categories of vulnerability, it was

observed that the impact of EVRF is progressive in the case of gas, i.e. the percentage change increase in the number of low vulnerable households facing energy poverty after a price increase is several times higher than for very high vulnerability households, which suggests that EVRF benefited the latter group more.

However, there was a significant difference between the type of fuel being used: an increase in electricity prices benefit low and medium vulnerability households, while an increase in gas prices has a disproportionately higher detrimental impact on low vulnerability households, and to a certain extent, medium vulnerability households. For low vulnerability households, subsidies for gas eliminated energy poverty and reduced it to 12 percent for highly vulnerable households. Subsidies for electricity reduced energy poverty by about 31 percent for highly vulnerable households.

The decrease in income poverty was substantial across all vulnerability categories, with a 43 percent reduction for highly vulnerable households. The reduction in income poverty increased progressively with vulnerability category, benefiting high and very high vulnerability households the most.

Using EVRF applicant registration data from November 2021 to February 2022 and November 2022 to February 2023, a panel-data random-effects model was employed to examine the impact of energy compensation on households' energy consumption. The effects of gas compensation decreased with increasing vulnerability level, while electricity compensation decreased consumption for low vulnerability households but increased it for others.

Thermal energy subsidies decreased consumption across all vulnerability groups, albeit less for highly vulnerable households than for medium vulnerability ones. Microsimulation findings suggest that energy subsidies primarily benefit highly vulnerable households. However, further research is needed to assess the impact on other energy sources, considering household characteristics for better targeting.

The findings from the micro-simulation suggest that energy subsidies benefit those in the very highly vulnerability category the most. Given its success, it could be applied to other type of energy sources, but this would require a more detailed dataset that not only includes household characteristics that are necessary for better targeting, but also details on households that did not receive such a compensation to evaluate the true causal impact of the scheme.

A caveat that concerns this analysis is that the microsimulation was conducted only for the months of November and December 2022, without considering the entire winter period, from November 2022 to March 2023, due to data limitations at the time of conducting the analysis. In addition, the EVRF applicant registration data had limited household

characteristics that could be useful to gauge the impact of the compensation to a more disaggregated level and types of households, dwellings, etc. In general, there is also a lack of theoretical consistency with the existing energy poverty metrics. This requires research on the development of microeconomic foundations that allow transparency, homogeneity, and replicability of these metrics.

Future research could address some of these challenges and take a step further by examining how incorporating an energy efficiency measure such as the inability to reduce energy consumption when facing higher energy prices can be linked to low energy efficiency levels. For more detail on microsimulation data see Annex V.

Computable General Equilibrium (CGE) modelling

For the Government and policymakers to understand how interventions in a particular area impact the desired targets, it was necessary to use a comprehensive and systematic framework to analyse the entire economy, capturing the interconnections between various sectors, industries, and agents. This allowed for a more holistic analysis of the economy's response to different policy measures and helped make informed decisions and design policies that are more likely to achieve desired economic outcomes.

The SDG Push employed a Computable General Equilibrium (CGE) model to understand the potential impacts of interventions. This model was used to build a case for policy intervention and assist policymakers in understanding the extent to which some sectors of the economy might be affected by change. Its main advantage is its flexibility, which allows to focus on the structure and details of agent-specific behavior and capture the detailed economic relationships and connections that would otherwise be missed in other models. This complexity allows the models to be applied to a wide range of 'what if' questions (see Annex VI for further details).

3.3 SDG Push Scenarios

A series of scenarios were run baseline scenario; an external gas price shock; and two alternative policy responses to the external shock.

In the baseline scenario, labor supply increases in line with population growth, and total factor productivity (TFP) was adjusted to mimic IMF GDP projections. The 2021 projections for 2022–2025 were used because they do not include price shocks due to the war in Ukraine.

In the external price shock scenario, TFP remained constant compared to the baseline, while changes in the international price of natural gas from 2022 to 2024 were introduced. Data from the World Bank's commodity price forecasts were used for this calculation, comparing price projections before and during the war in Ukraine. The price of natural gas

on the European market more than doubled in 2022 due to the war, posing a significant negative shock for gas-dependent economies like Moldova's.

In the targeted price subsidy scenario, the Government introduced a subsidy on natural gas consumption for households to counter rising prices. Gas prices were assumed to return to pre-war levels by 2025. The model determined household-specific subsidy rates consistent with the total funds allocated, with the most vulnerable households receiving the highest rates. The total subsidy over three years (2022–2024) amounted to 0.72 percent of the 2021 GDP, with the Government contributing 42 percent and external transfers covering 52 percent. The Government's contribution is drawn from its savings, potentially reducing its investment capacity.

Various methods exist to deliver subsidies, each with different efficiency costs and household incentives. As an alternative, the authors explored a cash transfer intervention where eligible households receive a set amount from the Government based on their energy vulnerability. For the modelling scenario, the single household cash transfer is determined endogenously, so that the overall amount spent on this intervention remains equal to the scenario with price subsidy. The structure of financing the intervention remains the same as in the case of price subsidy.

Wider economic impact

The SDG Push analyzed the increase in the world price of natural gas starting in 2022, which rose by 219.84 percent compared to the baseline. Projections indicated further increases in 2023 and 2024 by 106.52 percent and 91.01 percent, respectively, based on comparisons between natural gas prices in 2021 and 2023.

An increase in natural gas prices leads to a decline in the country’s GDP. Higher natural gas prices raised consumer costs and diverted household spending away from other goods. This shift in resources towards gas distribution, mining, and related services reduces both supply and demand in other sectors, impacted overall economic activity.

Income for all market agents, except some households, decreased year-on-year across all scenarios. In a targeted cash transfer scenario, income transfer offsets income loss caused by external price shocks for certain households. However, overall income growth remained below baseline levels throughout the intervention period.

Highly vulnerable and medium vulnerable households fare better than others, with income surpassing baseline levels in 2023 and 2024, respectively. However, all households reduced consumption due to the shock, alongside lower economic activity and resulting changes in tax revenues. Income and consumption gradually recover after natural gas prices return to normal.

Exports declined across all products, while imports, particularly of agricultural commodities and services, continued to rise. Savings decreased for firms, households, and the government during the intervention, with government savings continuing to decline even after natural gas prices stabilize.

Investments declined throughout the simulation period due to rising prices of investment goods and reduced demand, with a turning point expected in 2025 when investments start increasing again. Consequently, GDP declines relative to the baseline, accompanied by increased unemployment following the price shocks.

The two subsequent scenarios explored the impacts of the two distinctive designs of a fiscal intervention, i.e. a targeted price and income support to the households reflecting their energy vulnerability:

- **Scenario 1**: An increase in the world price of natural gas and a targeted price subsidy for natural gas consumption according to the energy vulnerability of the households.
- **Scenario 2:** An increase in the world price of natural gas and a targeted income transfer according to the energy vulnerability of the households.

The increase in the import price of natural gas has severely affected Moldova's economy due to its high dependency on energy imports and lack of diversification among the fuels and sources. The subsidy policy has helped to mitigate negative effect of price shocks. The targeted cash transfer is better than the targeted price subsidies. Although the difference is not significantly higher, the cash transfer reflects the households' preferences, including using the additional income for savings.

Neither price subsidies nor cash transfers of this order of magnitude can fully offset the negative impact of higher natural gas prices. This calls for finding an optimal subsidy rate (cash transfer income) to help households maintain their pre-shock levels of consumption while incentivizing substitution away from natural gas as part of the long-term goal of increasing energy efficiency.

This is a short- or medium-term analysis of energy price subsidies aiming to reduce energy poverty incidence in Moldova. In the longer term, energy price subsidies may constitute an incentive for, or a deterrent from, innovation, technological development, and productivity growth. They may also affect individuals’ decisions in the allocation of factors and distribution of consumption over time. Through their impacts on relative prices and investment decisions of the firms, energy price subsidies may have significant adverse

effects on allocating resources across sectors and economic agents, as the resulting price signals may not reflect the overall social costs of energy use.[1]

The Government's limited fiscal space might be another factor to consider. Its use for energy subsidies might reduce the ability of the Government to meet other immediate fiscal needs. The United Nations Secretary-General's SDG Stimulus to Deliver Agenda 2030 lays out a blueprint to provide the means to implement energy subsidies by providing liquidity to support recovery in the near term, enhance debt relief for vulnerable countries, and better leverage lending.

4. Recommendations

Based on the insights gained through the SDG Push process, the following interventions are proposed for further digitalization of public system services and for the future disbursement of energy subsidies through the EVRF platform:

1. Enhanced Integration of ministry systems: There is a need to further consolidate the systems within the MLSP into a unified collaborative platform. This integration will facilitate seamless connectivity with internal data from other agencies. Such streamlining will improve data availability and enhance their quality.
2. Establishment of a national master database: This centralized repository would compile data from various governmental databases, yielding multiple benefits for both governments and citizens. This unified database can provide accurate, current, accessible, and comprehensive data, which can guide energy policy decisions and foster better inter-agency collaboration.
3. Incorporation of standardized data from private energy suppliers: Collaboration with suppliers on standardized data from private energy, gas and heat suppliers holds potential for offering valuable insights into energy consumption trends. This collaborative approach can lead to cost reductions and provide the basis for informed interventions to mitigate energy vulnerability.
4. Integration of data from local public administrations: Integrating data sourced from local public administrations can furnish a clearer understanding of energy consumption patterns at the community level. This localized insight can pinpoint areas requiring the most urgent interventions.

[1] Caution is advised in interpreting fiscal multipliers as a measure of policy impact due to circularity issues with these estimates. Context is crucial for interpreting results, as the analysis has limitations. Elasticities and assumptions regarding production and consumption parameters significantly influence pass-through effects and overall macroeconomic impact. Sensitivity analysis was conducted to address these uncertainties.

5. Capacity building and staff training: Given the substantial personnel involvement in the EVRF registration process, it is advisable to establish a dedicated staff training center or utilize existing centers for enhancing data management skills. This training initiative will ensure improved data quality and proficiency among staff members.

In addition to specific recommendations related to the EVRF platform above, the MLSP should:

- Formulate and communicate a comprehensive data governance plan for the Ministry, uniting efforts related to data governance. It should also establish an internal data governance framework within the Ministry, outlining the roles and responsibilities of the various stakeholders engaged in the EVRF. Additionally, delineate processes and key policies for managing the data. This framework should undergo periodic evaluations and updates by the Ministry of Labour and Social Protection to ensure its continued relevance and efficacy.
- Give paramount importance to data quality by elevating data quality concerning the EVRF (and related systems) to a central priority. It should allocate resources to acquire the necessary tools and technologies, crucial for guaranteeing the precision, completeness, and uniformity of data. This encompasses regular data cleansing and standardization processes, combined with continuous monitoring and validation.
- Ensure robust data security by initiating the development and enforcement of an internal data privacy and security policy within the Ministry of Labour and Social Protection. It should also establish a dedicated working group to oversee how data are stored and utilized within the EVRF framework and align these practices with the General Data Protection Regulations (GDPR), adhering to EU standards.
- Streamline the registration process by simplifying it. This can be achieved by minimizing the number of required steps and information during the registration procedure. Such simplification enhances user convenience, facilitating their registration and access to compensation.

References

Decaluwé, B., Lemelin, A., Robichaud, V., and Maisonnave, H. (2013). PEP-1-t (Single-Country Dynamic Version). Partnership for Economic Policy (PEP). www.pep-net.org/pep-1-t-single-country-dynamic-version

Deaton, A., and Muellbauer, J. (1980). An almost ideal demand system. American Economic Review, Vol 70, no.3, pp.312-25.

Gray Molina, G., Montoya-Aguirre, M., and Ortiz-Juarez, E. (2022). Addressing the cost-of-living crisis in developing countries: Poverty and vulnerability projections and policy responses. UNDP, New York.

International Monetary Fund (2021). World Economic Outlook: Managing Divergent Recoveries. Washington, DC, April.

Luposur, A., Fala, A., Cenusa, D., and Madan. S. (2022). Republic of Moldova 2022 – State of the country report. Expert-Grup. Chisinau.

Kirchner, R., Chervyakov, D., Kuzentsov, A., Stiewe, C., and von Mettenheim, M. (2021). Gas price shock in Moldova: Compensation schemes for protecting the population. Berlin Economics. Berlin/Chisinau.

UNDP (2022). Moldova: targeted cash transfers to vulnerable groups to compensate for increased food and energy prices. UNDP, New York.

World Bank (2021a). Moldova Economic Update. Washington, DC. https://thedocs.worldbank.org/en/doc/7bf12b95f10a3daf7b570718b2100e15-0080012021/original/Moldova-Economic-Update-Spring-2021-FINAL-eng.pdf

World Bank. Moldova (2021b). Online consultations: Systematic Country Diagnostic Update for Moldova. SCD Update. www.worldbank.org/en/country/moldova/brief/systematic-country-diagnostic-update-for-moldova

Technical Appendices

Appendix I. Susbsidies per category of vulnerability

On average, highly vulnerable households that consumed natural gas received over MDL 1,000 more subsidies than medium and low vulnerability households, which received MDL 853 and MDL 359, respectively. Similarly, highly vulnerable households using thermal energy saw their bills reduced by MDL 1,324, while low vulnerable households received a compensation of MDL 795 L on average.

In comparison to the winter of 2022, gas prices have risen significantly by MDL 15.87, or 118 percent. For natural gas, the price range that households are required to pay per m^3 starts at MDL 12 for the high vulnerability category, to MDL 29.27 for the non-vulnerable category without any compensatory contribution.

However, the Government's natural gas subsidies were able to cover 63 percent of this price increase, i.e. households were only left to bear 37 percent of the additional cost due to the higher gas prices. For households using thermal energy, the situation was more challenging because the price substantially increased by 75 percent. The price that households are required to pay per m^3 ranges from MDL 1,450/GCal for highly vulnerable households, to MDL 3,082/GCal for the least vulnerable who are not receiving any subsidy. Nonetheless, the Government's subsidies managed to cover 84 percent of this price hike. Electricity subsidies, although covering a significant portion of the population, were not as effective in dealing with the rising electricity prices; they were only able to cover 11 percent of the price increase for electricity, leaving households to pay the remaining 89 percent of the increased costs.

The average household net income (calculated as the household income after deducting the household's minimum expenditure level – MDL 3,430 for the main applicant and an additional MDL 2,400 for each subsequent family member registered) is MDL 5,725, which is above Moldova's average minimum wage of MDL 4,000 per month.

Appendix II. Data challenges

During the development phase, there were data and services-related issues, mainly those related to **technological and institutional set-ups**. These challenges affected data access and quality, highlighting the need for effective data governance measures to ensure correct and prompt information for energy vulnerability reduction efforts.

Inaccessible data services or delayed responses

Cadastral data

- The data requested included cadastral numbers and property area, among other details. However, the data service provider faced delays due to an outdated system and inadequate resources to handle large requests. Consequently, the data service could not be effectively utilized. To address these challenges, a decision was made to retrieve data in comma -separated value (CSV) format. Nonetheless, this solution required more development effort and manual intervention, and the process needs to be performed periodically to prevent data from becoming obsolete.
- Determining whether a household falls under condition 2 (as per Law No. 704/2022, p.2512) required standardizing property shares owned by the household. This task proved time-consuming due to the varying formats in which shares were presented in the cadaster data, such as fractions, percentages, and variations of decimal notation. Standardizing these shares demanded approximately six hours of manual work to rectify erroneous data. Moreover, some real estate properties lacked value information, while others had been assessed decades ago, further complicating the procedure.
- Despite these challenges, the dedicated efforts of EVIS administrators enabled the review and manual correction of several dozen cases involving discrepancies in cadastral data.

Energy consumption data provided by private energy distributors

The requested information pertains to the energy consumption data of customers. However, challenges arose due to data quality issues stemming from non-standardized data, errors in assigning unique registration numbers (Place of Consumption Number, pr NLC) to consumers, and instances of duplicated entries in the database, where a single customer was registered multiple times, or two customers indicated the same NLC in their submissions.

Similar to the above scenario, the solution involves acquiring the data in XLS format and conducting data cleaning procedures. However, this approach also entails a heightened degree of manual effort and should be conducted on a monthly basis to obtain accurate customer energy consumption data.

To address these challenges, it is advisable to establish a standardized process for NLC numbers. This process can encompass the formulation of guidelines and rules for NLC number assignment, combined with the integration of data quality checks to ensure precision. Additionally, enhancing data collection and storage procedures involves incorporating data quality checks during the data gathering process, deploying data validation techniques, and storing data in a standardized format to facilitate analysis and manipulation.

By enhancing the processes of data collection and storage, the likelihood of errors and inconsistencies within the data can be diminished, leading to an overall improvement in data quality.

Fiscal data

The datasets encompass details related to citizens' income. However, a predicament arises from the service that supplies fiscal data, since it consistently exhibits delayed responses. This typically requires submitting subsequent requests, often the second or third, to successfully procure the desired information. This situation introduces an inefficiency within the system's overall functioning, generating surplus requests that impose an undue load on the server.

These factors collectively contribute to a scenario where the fiscal data service struggles to promptly address initial requests, prompting clients to make multiple attempts. Consequently, a vicious cycle is engendered wherein the server becomes inundated with redundant requests, exacerbating the delay in response time, and adversely impacting the system's comprehensive performance.

To mitigate this predicament, it is of paramount importance to conduct a comprehensive examination of the service architecture. This entails identifying bottlenecks or constraints and subsequently implementing appropriate optimizations or enhancements to ensure that the server's responsiveness is both efficient and timely.

Incomplete or missing data

Gender disaggregated data

Due to interoperability challenges, data pertaining to gender could not be retrieved for approximately 0.1 percent of respondents. Within the population data service, the lack of gender data can be attributed to various factors, including human errors, system or equipment malfunctions, sample loss, and/or deficiencies in the technical aspects of data recording.

To address this issue, it is imperative to establish robust protocols for data exchange, ensure uniform data formats and adherence to standards, and implement error-checking mechanisms. These measures collectively aim to minimize the adverse effects of these factors on the accuracy and comprehensiveness of gender data within an interoperable framework.

The availability of gender-disaggregated data is pivotal in identifying gender-specific trends in energy consumption, expenditure, and accessibility to energy services. Subsequently, this information can be used to design targeted interventions aimed at enhancing energy access and alleviating energy poverty among both women and men. Furthermore, gender data aids in identifying the distinct requirements and vulnerabilities of women and girls in the context of energy poverty and susceptibility. For instance, it can highlight the impact of energy poverty on women's health, safety, and education.

Heating data from tenants' association of condominium

The challenge linked with the heating data sourced from the condominium dataset lies in its aggregated nature at the association level. Consequently, it becomes complex to attribute heating usage and consumption to individual households, given that they lack distinct NLCs on a per-household basis. Instead, a singular NLC is assigned for the entire condominium. This presents a hurdle for the EVRF's objective of tailoring compensations based on energy consumption and vulnerability, specific to each household.

Since the NLC is unique to each association rather than each household, the association receives a collective heating bill encompassing all households within it. Subsequently, the association's accountant must generate separate invoices for each apartment or household, derived from energy meter readings of individual apartments.

To tackle this challenge, it is imperative to devise a means of disaggregating the data down to the household level directly within the EVIS. This enhancement would facilitate more accurate targeting of compensations based on individual energy consumption and vulnerability levels. This endeavor involves collaborating with condominium associations to

acquire more detailed data or exploring alternative data sources, such as individual household energy bills, to augment the existing dataset.

For the 2022–2023 heating season, these data were procured through email exchanges and the sharing of Excel files between EVIS administrators and administrative bodies of associations. This process proved immensely labor-intensive, with up to 500 emails exchanged per month. A more direct integration of association data into EVIS would streamline operations, alleviate the manual workload, and minimize the likelihood of human errors.

Income data

Despite EVIS incorporating data from the Fiscal Inspectorate to validate, supplement and rectify income information provided by applicants, instances still arise where the energy vulnerability category is computed using a reported monthly household income of zero. This stems from the fact that the Fiscal Inspectorate lacks income data for these specific households, resulting in MConnect's inability to furnish this information to EVIS.

As of March 2023, there were 28,384 households denoted with "total monthly income = 0". This circumstance highlights cases where fraud may be occurring, yet EVIS lacks the capability to rectify them. It is implausible for a family to subsist without any income. Because the computed income for these households was zero, they were categorized as having "very high" energy vulnerability.

Given that undisclosed employment is a significant challenge in the Moldovan labor market, various ambitious initiatives have been launched nationwide in the past year to address this issue. These include the "Trecem pe alb" campaign, the overhaul of the Labour Inspectorate, and a comprehensive campaign to recruit labour inspectors. While these endeavors aim to enhance the comprehensiveness of the national income database, there is also room to implement internal measures within EVIS to prevent unjust categorization of energy vulnerability for such cases.

Appendix III. Scoping Phase

As a result of the 2017 SDG systems mapping, the following barriers and potential accelerators have been identified:

Barriers

Lack of effective, accountable, and inclusive institutions

- high corruption levels that impact the entire society, public and private institutions.
- tolerance by society of a non-functioning of rule of law leading to acceptance of corruption.
- state institutions that do not ensure the creation of good laws and proper policy.
- lack of good governance of state institutions.
- poorly developed rule of law, which creates a lack of justice.
- lack of confidence in government, which increases emigration and creates a lack of participation in civic matters.

Reduced social cohesion

- an unfriendly business environment.
- reduced social cohesion.
- lack the sense of belonging to a common society.
- identification with different ethnic and religious groups.

Quality of life

- lack of job opportunities and wage growth, which leads to high unemployment and emigration.
- the gap between current education and what the labour market requires, which decreases employment opportunities (poor human capital).
- disparity between rural and urban areas.
- unequal distribution and access to resources.
- lack of security or not feeling safe for the future.
- inadequate health and social services.
- the most vulnerable populations are not ensured the needed resources.

In addition, assessing the level of implementation of the SDGs has identified solutions that would accelerate progress in the lagging areas.

Potential accelerators

1. Responsible and accountable institutional development

- Creation of a rule of law (target 16.3)
- Fair access to the rule of law and justice for all, creating a participatory society
- Reduction in corruption and bribes (target 16.5)
- Elimination of the culture of tolerance for corruption
- Institutional development (target 16.6).

2. Social cohesion for the inclusion of everyone

- No one is left behind and there are equal opportunities for all
- Everyone contributes to the vision
- Universal health coverage (target 3.8)
- Health and public services are rebuilt to meet the needs of the client
- A reformed education system in place to serve students, which includes civic learning and older demographics.

3. Labour force

- Quality of education with valid skills needed in the market (target 4.4)
- Knowledge and skills for sustainable development (target 4.7).

4. Creation of a favorable investment environment

- Credibility to keep investments from leaving
- Attraction of foreign investments
- Job creation with decent salaries to reduce emigration and enhance human capital (target 8.5).

5. Environmental focus

- Prevention of pollution through strategic environmental objectives (targets 13.2, 15.9)
- Improvement of health and quality of life (target 1.2).

In addition, Moldova conducted a light Rapid Integrated Assessment (RIA) of its national policy documents (e.g. strategies, programmes, and plans). This exercise aimed at identifying gaps and weaknesses in the national policy framework regarding the implementation of the SDGs.

The RIA showed that, overall, the national policy agenda is only partially aligned to the SDGs, and a third of the SDG targets are not included in any national policy papers. A total

of 169 SDG targets was analyzed, and special focus was placed on 126 quantitative targets. After mapping the national policy agenda and comparing it with the SDGs, it was found that only 11 percent of SDG targets were aligned to the national policy papers; therefore, they do not require any adjustments in terms of SDG alignment.

Most of the SDG targets (57 per cent) are only partially aligned to Moldova's policy papers – only a few components of these targets are included, so the relevant national strategies need to be adjusted to better reflect the spirit and details of the SDG targets. In addition, the national policy papers do not reflect approximately one-third of the SDG targets.

Annex IV. The QUAIDS and panel data model

Our methodology to estimate the household demand for energy is based on the Almost Ideal Demand System (AIDS) model, which gives an arbitrary first-order approximation to any demand system derived from utility-maximizing behaviour. Also, its functional form is consistent with household-budget data. Individuals are assumed to maximize their satisfaction level by the consumption of different goods such as energy, food, and clothing. The utility maximization will be subject to a budget constraint determined by the individual's income (or desired expenditure) and the prices of the goods consumed.

The Quadratic Almost Ideal Demand System (QUAIDS) model chosen for this analysis is an extension of the AIDS originally proposed by Deaton and Muellbauer (1980). Based on a non-parametric analysis of consumer expenditure patterns, Engel curves have been shown to be of higher rank than 2, thus requiring quadratic terms in the logarithm of expenditure.

To derive the budget shares in QUAIDS, the same procedure used for AIDS can be applied, which yields the following expenditure share equations:

$$w_i = a_i + \sum_j \gamma_{ij} \ln p_j + \beta_i \ln\left(\frac{X}{a(p)}\right) + \frac{\lambda_i}{b(p)}\left[\ln\left(\frac{X}{a(p)}\right)\right]^2$$

Where, wi is the share of commodity i in a household budget, defined as:

$$w_i = \frac{p_i q_i}{m} \; and \sum_{i=1}^{n} w_i = 1$$

Pj is the market price for commodity j, M represents consumer total expenditures or income, and P is an overall price index. For prices, the Stone price index was used, which is defined as:

$$Log\ P = \sum_{i=1}^{n} W_i log p_i$$

where wi is the of budget share for good i and p is CPI index obtained from Moldova Statistical Office for each of 52 commodities reported on a monthly basis in HBS. For the analysis, budget share equations are estimated, and elasticities obtained for electricity and gas, and other commodities, the latter being grouped into the category “other”.

In addition to price and income, the socio-demographic characteristics also alter spending in different ways. For instance, it is expected that a larger family increases its overall expenditure on energy compared to a smaller family with the same preferences. The socio-demographic variables included in the model are the size of the household, adults over the

age of 65, education, whether they live in an urban or rural area, and whether or not the household head is female.

In addition to elasticity estimation, which is a crucial input in microsimulation using HBS data, panel random effects regression was used to estimate the effects of energy subsidies on the change in volumes consumed by households between the current (November 2022 to February 23) and the previous winter (November 2021 to February 2022), controlling for household characteristics. The latter technique is applied to registration data. The availability of repeated observations on the same units, in this case households, allows to enrich the model by inserting an additional term in the regression, capturing individual-specific, time-invariant factors affecting the dependent variable but unobserved to the econometrician. Generalized least squares estimators of the parameters of such a model are more efficient than those obtained in the simpler model, which neglects these unobserved factors.

The random effects model is an alternative to the Fixed Effects Model, which helps capture the effects of **all variables** that do not change over time. Hence, anything else that does not change over time at the household level, such as its location, would be captured by these fixed effects terms in the model. Therefore, it is not possible to separately estimate the effect of the firms' location on their performance, which is highly restrictive for some applications. Hence, the authors chose to adopt the random effects framework instead, even though these models impose stronger assumptions about the unobserved effects. The random effects model allows for a consistent and efficient estimate of regression coefficients and allows to identify the effect of the compensation by exploiting its variation across households when some of the control variables are time-invariant.

Appendix V. Microsimulation Data

For the microsimulation analysis, Moldova Household Budget Survey (HBS) data from 2019 to 2022 were used. The HBS, which is nationally representative, was administered by the National Bureau of Statistics of the Republic of Moldova. The total sample size of the Survey across the four waves was 16,648 households (HHs), distributed as follows: 2019 (n=4,408 HHs), 2020 (n=4,282) HHs, 2021 (n=4,079 HHs) and 2022 (n=3,879 HHs). This sample captures the before and during compensation household situation.

The Moldova HBS collects a wide range of variables to capture various aspects of the population's living conditions, socio-economic status and well-being. Some of the key variables are:

1. Demographic variables: These include information about household members such as age, sex, marital status, educational attainment, and relationship to the head of the household.
2. Economic variables: These variables focus on the economic activities and financial situation of households. They may include employment status, occupation, industry of employment, income sources and household expenditure patterns.
3. Housing variables: These variables provide insights into the housing conditions of households, including type of dwelling (e.g. house, apartment), housing quality, ownership status, rental costs, access to basic amenities (e.g. water, electricity) and sanitation facilities.
4. Assets and wealth variables: These variables capture information on household assets such as land, livestock, vehicles, savings, and other financial holdings. They help assess the wealth and economic well-being of households.
5. Education variables: These variables cover educational indicators such as literacy rates, school enrolment, highest level of education completed, and educational aspirations of household members.
6. Health variables: These variables focus on the health status and healthcare utilization of household members. They may include information on self-reported health, disability status, access to healthcare services, and health insurance coverage.
7. Social assistance variables: These variables capture the participation of households in social assistance programmes or safety net initiatives, such as social pensions, child allowances and targeted cash transfer programmes.
8. Migration variables: Given the significance of migration in Moldova, surveys often collect information on migration patterns, including international and internal migration, remittances, and the impact of migration on households.
9. Access to services variables: These variables assess the accessibility of households to essential services such as education, healthcare, clean water, sanitation, and transportation.
10. Poverty and inequality variables: These variables are used to estimate poverty rates and measure income or wealth distribution within the population. They include variables related to income, consumption and wealth, and various poverty indicators.

These variables provide valuable insights into the social and economic conditions of households in Moldova, helping to inform policies and interventions aimed at improving the well-being of the population.

The data used in the second part, analysis of the effects of compensation scheme on energy consumption, include:

1. Energy consumption data by distributor and energy type: This dataset contains the respective quantities consumed and expenditure on gas, electricity, and thermal energy. The data cover the period from October 2021 to July 2022.
2. Energy consumption data by distributor and energy type for the period November 2022 to February 2023. The variables covered include the following:

    - the total volume of the energy type delivered to the household consumer.
    - the volume of the energy type delivered within the limits of the maximum compensated.
    - the total expenditure in each energy type – electricity, gas and thermal by each household.
    - the total energy expenditure by each household.
    - the category of energy vulnerability as assigned by energy companies.
    - the amount of compensation for maximum volume compensated per month (in MDL).
    - the name of the energy distributor.

3. The registration data of the Energy Vulnerability Reduction Fund (EVRF) shows that there were 758,546 applicants (see the application site at https://compensatii.gov.md/en): These data provide details about the household for which compensation is requested, as follows:

    - average net monthly income of the household indicated by the applicant in the application form (calculated based on the last six-monthly incomes, in MDL).
    - the household income (in MDL) used in the calculations to determine their category of energy vulnerability. If the income provided by government databases (CNAS, Fiscal Inspectorate) is higher than the income indicated in the application, then the higher income will be the one used in the calculations.
    - the household income (in MDL) after deducting MDL 3,430 from the household's minimum expenditure level for the main applicant and deducting MDL 2,400 for each subsequent family member registered).
    - the sum of social benefits that the household receives per month, as provided by The National House of Social Insurance (in MDL).
    - global monthly income reported by the household.
    - the household's estimated monthly expenditure on energy (in MDL), obtained by multiplying last year's average monthly energy consumption (monthly average for November 2021 to March 2022) (in GCal, m3, kWh) by current non-compensated rates (MDL/GCal, MDL/m3, MDL/kWh).
    - the category of the energy vulnerability attributed to the applicant for November, December, January, and February, (0 – non-vulnerable; 1 – low vulnerability; 2 – medium vulnerability; 3 – high vulnerability; 4 – very high vulnerability.
    - number of household members.
    - dummy for at least one person in the household with a confirmed disability.
    - district name.

- number of land plots registered per household.
- number of cars owned by the household.
- gender ratios in the household.
- age brackets in the data.

4. Distributor and applicant identification, which contains the applicant's and distributor ID variables that were used to merge the datasets (1 to 3), i.e. with the energy and applicant registration data.

Appendix VI. The CGE analytical framework

The analysis is built on Partnership for Economic Policy- (PEP) 1-t (dynamic version for a single country) by Decaluwé et al. (2013). It is a recursive dynamic CGE model. The model is calibrated to replicate the base year (2021) Social Accounting Matrix (SAM). In the model, the public investment is quasi-exogenous, and savings are fully endogenous (investment-driven). The historical growth rate drives the dynamics of the main variables at 6.7 percent per annum. Labour market variables follow the country's population growth rate, which has been declining at 2.3 percent annually.

Investment levels from the previous period determine the sectoral capital accumulation rates in the current year, considering the prices of capital goods and depreciation. Capital depreciation is set at 5 percent. Modelling of the labor market determines wages, labor allocation across different industries, and unemployment.

The unemployment rate starts at 2.6 percent, as reported by the Statistical Agency for 2021. In the model, unemployment is determined through a wage curve, a functional relationship between unemployment and wages, which determines the wage-employment relationship. For the sake of simplicity, current account balance and savings are treated as exogenous variables. Similarly, government spending remains exogenous, leaving the fiscal balance to adjust to the revenues. It should be noted that the model does not fully capture the full pricing framework for energy commodities. A government-owned monopoly company distributes natural gas in Moldova. As a result, households pay regulated prices, which do not necessarily cover the production costs.

The baseline for the analysis was taken from the IMF April 2021 economic outlook (IMF, 2021) for Moldova. The outlook was marked by multiple uncertainties, including the evolution of the COVID-19 pandemic and the local political environment. Given the limited economic activity in 2020 and GDP declining by 7 percent, driven by lower private consumption and five-year low employment levels, a slow recovery is expected.

The slow rebound in 2021 gave rise to inflation, reaching 3.8 percent in 2020 and sharply increasing in 2021. The country’s fiscal stance was challenging due to the efforts to mitigate the impacts of the pandemic and weak labor market conditions. As a result, public debt is expected to increase. The expected budget deficit in 2023 will reach around 6 percent of Moldova’s GDP. Poverty, measured by the US$5.50 purchasing power parity (PPP) per day poverty line, is expected to increase.

The analysis draws on Moldova's estimated SAM, which reflects the base year 2021.[2] The procedure deployed to estimate the SAM builds on available statistics from the aggregated national accounts, generation of income account and government finance statistics, industry production accounts, and external trade. The data were compiled and used to disaggregate the activity, commodity and production factor accounts of the SAM, and domestic institutional sectors. The 2021 SAM can distinguish between 10 different activities and commodities, two types of production factors (labor and capital) and four categories of households (distinguished based on their energy vulnerability). The SAM also includes the main fiscal policy instruments, including VAT, taxes on imports, products and production, income, and excise taxes. Table A3.1 captures the structure of demand and supply structure of the economy. Private consumption (83.55 percent) is the main driver of the GDP growth. The supply side is dominated by services that target the domestic market and are produced by local producers, followed by manufacturing (21 percent of GDP). The ratio of imports and domestic production is close to 1, i.e. the competition in the domestic market between imports and domestic production for this sector is critical. The share of value added of energy sector is about 2 percent of GDP, and the supply of energy commodities is dominated by imports (Table A3.2).

Table A3.1 Structure of the GDP

	Ratio to GDP (%]
Private consumption	83.55
Public consumption	16.76
Investments	26.86
Exports	30.65
Imports	57.82

Table A3.2 Structural indicators

	VA/GDP	Import/XS	Export/XS
Agriculture	0.10	0.04	0.12
Manufacturing	0.21	0.90	0.30
Energy	0.02	1.70	
Services	0.55	0.10	0.15

Source: Author’s calculations.

Private consumption accounts differentiate between four categories of private households, which are classified according to their degree of energy vulnerability.

[2] Note that the underlaying SAM was estimated in its aggregated from on a basis of the available statistical evidence.


UN
DP