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Better Climate Policies for Eastern Partner Countries

Consolidated Recommendations for Mainstreaming Climate Change Considerations into the Energy Policy of Moldova and Further Development of National Practices of Greenhouse Gases Emissions Measurement and Reporting in the Energy Sector Taking into Consideration the Best Practices.

Data Interpretation and Methods of Data Collection in Republic of Moldova aligned with EU Regulations and Best Practices and a Comparative Analysis on Data Interpretation and Reporting in Other Eastern Partnership Countries

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SUMMARY

The overall objective of the report is to design and conduct a review and analysis of the national policies, legal and regulatory framework in the energy sector in order to make recommendations for the incorporation of climate change considerations into the respective sector planning processes.

The report provides consolidated recommendations for mainstreaming climate change considerations into the energy policy of Moldova and further development of national practices of greenhouse gases emissions measurement and reporting in the Energy Sector taking into consideration the best practices.

The report provides an overview of the data interpretation and methods of data collection in Republic of Moldova aligned with EU Regulations and best practices and a comparative analysis on data interpretation and reporting in other Eastern Partnership Countries.

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1. REVIEW OF RELEVANT INTERNATIONAL, REGIONAL AND NATIONAL SOURCES OF INFORMATION ON PAST, CURRENT AND PROJECTED CLIMATE CONTEXT RELEVANT TO THE REPUBLIC OF MOLDOVA. DEVELOPMENT OF A DRAFT CLIMATE RISK PROFILE OF ENERGY SECTOR IN THE REPUBLIC OF MOLDOVA

1.1. Climate Risk Profile of the Energy Sector of the Republic of Moldova

The climate change has negative long-term impacts on the country's economic growth and it affects the energy sector directly and indirectly. According to the National Communications, the energy sector of the Republic of Moldova is likely to be affected by three types of negative climate impacts:

- temperature increases;
- changes in precipitation regimes;
- increased climate aridity associated with the frequency and intensity amplification of extreme weather events (heatwaves and frost, floods, storms with heavy rains and hail, severe droughts).

The Republic of Moldova has an evolving climate change adaptation sectoral policy framework, with many complementarities and links to the cross-cutting sustainable development policy issues. Therefore, the mitigation and adaptation priorities relevant to the energy sector of Moldova derive from both the national climate change policies and related development national and sub-national policies and plans.

A summary of climate impacts and vulnerabilities of the energy sector of Moldova as well as its mitigation and adaptation priorities are presented in Table 1 and 2.

Table 1. Climate Change Impacts and Main Vulnerabilities of the Energy Sector of the Republic of Moldova

Climate risk	Risk probability	Climate risk impact on sector and its vulnerabiliy
Energy Sector		
Increasing temperatures	High	Increased demand for electricity due to higher summer temperatures and the need for indoor air conditioning and industrial processes cooling
	High	Increased natural gas consumption due to increased electricity demand
	High	High loss in electricity because of intensive use of electrical cooling equipment due to increased air temperature
	High	Reduced electricity and heat generation capacities of power plants caused by insufficient heat loading
Water regime changes	High	Increased electricity demand for irrigation caused by lower soil moisture
	Medium	Reduced electricity generation capacity of power plants caused by the decrease of water flow in Prut and Dniester Rivers as a result of reduced precipitation volume
Extreme weather events (heatwaves; frost; droughts; floods; winds, hailstorms, more frequent and intense strong rains)	Medium	Decreased resilience of energy sector infrastructure, including assets useful lifespan, higher capital expenditure and running costs
	Medium	Increased intensity of energy caused by higher electricity consumption for air conditioning and irrigation. Increased intermittency in electricity supply
	Medium	Climate change (drought) compromised wood production, including biomass production for energy generation and production of liquid biofuels
	Medium	Longer duration of unplanned power supply distortions due to the increase in the frequency of spontaneous fires and the need to protect airlines
	Medium	Decrease in the share of electricity production from renewable energy due to reduced back up of balancing energy
Transport Sector (Fuel Consumption-related Issues)		
Increasing temperatures	High	Decreased resilience of transport sector infrastructure, including assets lifespan, higher capital expenditure and running costs
Water regime changes	High	Increased damage of road cover and increased fuel consumption by transport
	High	Larger length of the airport runway and more fuel required due to less dense air
	High	Longer travel time due to speed restrictions
Extreme weather events (heatwaves; frost; droughts; floods; winds, hailstorms, more frequent and intense strong rains)	Medium	Infrastructure deformations caused by heat waves, rain storms, floods and snow variations: damage to roads, railways, airport runways, piping systems, bicycle paths and sidewalks, bridges and viaducts
	Medium	Reduced circulation of public transport and/or increasing costs that will primarily affect vulnerable groups
	Medium	Travel and timetable delays
	Medium	Loss of visibility due to fog, snow, loss of maneuverability, obstruction of pathways, use of chemical treatment for dispersion

Source: NDC2, Expert Assessment

Table 2. Climate Change Mitigation and Adaptation Priorities of the Energy Sector of the Republic of Moldova

Sector	Priority	Main Activities to Support Secoral Mitigation and Adaptation
Energy	Ensure reliable, clean and affordable energy	– Reduce the incidence of energy poverty, mainly through the implementation of measures that contribute to reducing energy costs and making energy consumption more efficient; – Promote the development of "green" energy. Stimulate the interest for "green" energy production and consumption by capitalizing on renewable energy sources (wind turbines and hydro installations, PV systems, solar panels for heating and hot water production), including the use of efficient and clean biomass production technologies, as well as facilitating the connection of production facilities to existing distribution capacities; – Promote public street lighting modernization projects; – Promote climate technologies that create jobs in the energy sector for both women and men, youth people.
	Promote increased resilience of climate-smart infrastructure in the energy sector	– Develop quality, reliable, sustainable and resilient infrastructure throughout the country to support economic development and population well-being, with an emphasis on broad and equitable access for all; – Build storage facilities for the energy produced by wind and photovoltaic power units; – Promote decentralized generation of electricity (solar photovoltaic systems, hydraulic installations, micro-hydroelectric stations, etc.); – Promote energy efficiency (e.g.: use of modern energy generation and transport technologies, thermal insulation of buildings, construction of refrigerators near CHPs and producing steam cold for the preservation of fruits and vegetables, etc.); – Restore electrical stations equipment of energy distribution networks designed for defrosting/de-icing or introduce new defrosting technologies; – Improve the robustness of electricity transmission and distribution infrastructure; – Optimization of heat supply by establish free economic zones close to CHPs for economic production of the sectors that use steam or hot water in technological processes (greenhouses, absorption refrigeration systems, processing of agricultural raw materials, etc.); – Promote climate-proofing buildings and infrastructure and increase their energy efficiency performance; – Revise existing building standards to ensure that new buildings are resilient, energy-efficient, have additional mitigation effects; – Contribute to the development of a robust project pipeline for climate-smart infrastructure.
Transport (Fuel Consumption-Related Issues)	Improve understanding of climate change-related risks and support planning capacities for	– Provide training to decision-makers managing the construction of transport infrastructure on climate risk impacts; – Undertake periodic assessments of the level of resilience to climate change impact of the transport infrastructure; – Produce a research-analysis-assessment platform on climate change risks with impact on transport infrastructure, involving insurance companies;

Sector	Priority	Main Activities to Support Secoral Mitigation and Adaptation
	climate-resilient infrastructure in the transport sector	– Communicate transport sector climate risks to the targeted audience and general pubic using georeferenced data on climate hazards, social and gender vulnerabilities, risk mapping covering different scenarios of threats, other tools. – Carry out research on the design and development of advanced materials and technologies aimed at increasing the resistance of roads, railways, aerodromes, ports to climate hazards; – Adjust urban and land-use planning to future climate change-related risks for transport infrastructure (roads, bridges, railways, waterways, aerodromes); – Promote funding schemes to support climate action that fit specific transport sector related needs, geographic area, other specifics.
	Improve access to climate-resilient and safe public transport	– Ensure the access of citizens to safe transport systems with fair, accessible and sustainable prices for all, as well as improving road safety, in particular by expanding the public transport system; – Promote a well-developed cycling path network, accessible pedestrian routes; – Promote more sustainable consumer behavior in using transport.
	Create sustainable transport infrastructure	– Implement adaptation measures to combat the effect of temperature variation: heat-tolerant streets and highways, landscape protection, heat-resilient paving materials; milling out ruts; shifting construction schedules to cooler parts of the day; design for higher maximum temperatures in replacement or new construction; adaptation of cooling systems; – Promote and implement adaptation solutions for extreme precipitations such as climate-resilient paving materials and overlay with more rut-resilient asphalt; use of the most efficient technologies to assure sealing and renewal of asphalt concrete; wider use of efficient road maintenance methods, including preventive and corrective maintenance; improve flood protection; greater use of sensors for monitoring water flows; upgrading of road drainage systems and improved collection and disposal of rainwater from the roads; pavement grooving and sloping; implement increased standards for drainage capacity for new transportation infrastructure and major rehabilitation projects; – Identification and implementation of corporate management and advanced technological models for the management of transport infrastructure in response to the impact of climate change; – Purchase the necessary equipment for cleaning and widening riverbeds, and the development of a system for navigation monitoring, etc. – Contribute to the development of a robust project pipeline for climate-smart infrastructure.

Source: NDC2, Expert Assessment

2. ANALYSIS OF THE ENERGY SECTOR DEVELOPMENT POLICIES, STRATEGIES, PROGRAMS AND PLANS TO ASCERTAIN THEIR ALIGNMENT WITH LOCAL, NATIONAL AND INTERNATIONAL PRIORITIES FOR CLIMATE CHANGE MAINSTREAMING, INCLUDING THE STIPULATIONS OF REGIONAL AND INTERNATIONAL FRAMEWORKS AND INSTITUTIONS

2.1. Overview of Current Legal Framework of the European Union and its Impact Assessment

The European Union provides a good example of a coherent climate policy. Over the past decades, the EU has adopted several dozen high-level documents that define the main directions of its climate and energy policy. Table 3 provides a brief overview of the key regulations of the EU related to climate change, energy use and energy efficiency.

Table 3. Key EU-level Climate-Related Regulations related to Climate Change, Energy Use and Energy Efficiency

EU Regulation	Energy Sector	Transport Sector
Biofuels directive 2003/30/EC		X
Biomass Action Plan COM(2005) 628 final	X	
Cogeneration Directive 2004/8/EC	X	
Directive 2012/27/EU on end-use energy efficiency and energy services	X	X
Directive 2009/72/EC of the European Parliament concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC	X	
Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings.	X	
Directive 2016/2284 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC		X
Directive on Deployment of Alternative Fuels Infrastructure (2014/94/EU)	X	X
Directive on the Promotion of Clean and Energy Efficient Road Transport Vehicles 2009/33/EC	X	X
Eco-design framework directive 2005/32/EC and its implementing regulations	X	
Effort Sharing Decision 406/2009/EC	X	X
Effort Sharing Regulation EU 2018/842	X	X
Electricity production from renewable energy sources (Directive 2001/77/EC)	X	
Energy Efficiency Directive 2012/27/EU and amended by Directive 2018/2002	X	X
Energy efficiency requirements for household electric refrigerators, freezers and combinations Directive (Directive 1996/57/EC)	X	
Energy Taxation Directive 2003/96/EC	X	X
EU ETS directive 2003/87/EC as amended by Directive 2008/101/EC, Directive 2009/29/EC and Directive 2018/410 and implementing legislation, in particular 2010/2/EU, 2011/278/EU, 2011/638/EU, 176/2014/EU, and Decision (EU) 2015/1814	X	
Eurovignette Directive on road infrastructure charging 2011/76/EU		X
Labelling Directive 2003/66/EC and 2010/30/EC	X	
Motor Vehicles Directive 2006/40/EC		X
Regulation EURO 5 and 6 2007/715/EC		X
Regulation Euro VI for heavy duty vehicles 2009/595/EC		X
Regulation on CO2 from cars and vans (2009/443/EC, (EU) No 510/2011, (EU) No 397/2013, (EU) No 333/2014, (EU) No 253/2014, 2013/128/EU, (EU) No 396/2013, (EU) No 114/2013)		X
RES Directive 2009/28/EC and RES recast (Directive 2018/2001)	X	X
EU Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas	X	
Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products	X	

Source: European Commission

The following areas are in focus of EU climate and energy policies:

- Energy efficiency;
- Renewable energy;
- Cogeneration of heat and power;
- Heating and cooling;
- Energy efficient products; energy label and ecodesign; rules and requirements for energy labelling and ecodesign;
- Energy performance of buildings; nearly zero-energy buildings; long-term building renovation strategies; obligation schemes and alternative measures; central government buildings;
- Current funding, innovative financing, de-risking investments, financing renovations;
- Energy efficiency certificates and inspections;
- National action plans and annual progress reports;
- Capacity building and technical assistance,

Annex 4 provides and in-depths review of the key aspects of current energy- and climate-related Legal framework of the European Union.

2.2. Analysis of European Climate Change Mitigation Policies and Measures and their Relevance to Moldova

Hundreds of energy-specific policies and measures are adopted and are implementing in EU member states and the United Kingdom. Policies and measures aimed at improvement of energy efficiency, sustainable transport and electricity and heating sector are the most widespread across Europe. At the same time, such PaMs as education and outreach, energy and carbon storage, waste to energy solutions, sustainable procurement, energy metering, sectoral measures in agriculture and energy management are mentioned as important areas of national-level climate policy by 3-7 countries only.

According to estimates of EEA, several policies make the greatest contribution to expected GHG emissions reduction in the European Union.

The highest GHG emissions reduction is expected to be achieved as a result of implementation of PaMs related to implementation of Renewable Energy Sources Directive (expected GHG emissions reductions may achieve 240.1 million t CO_2e by 2030).

Implementation of PaMs in compliance with the Energy Efficiency Directive may contribute to GHG emissions reduction up to 118.8 million t CO_2e.

Recast of the Energy Performance of Buildings Directive and implementation of provisions of the EU Emissions Trading Scheme Directive will also contribute to GHG emissions reduction of about 133.7 million t CO_2e.

Table 4 summarizes expected GHG emissions reduction linked to key EU Policies in 2030.

Table 4. Expected GHG Emissions Reduction Linked to Key EU Policies in 2030, Thousand t CO_2e

Union policy	Existing Policies and Measures	Additional Policies and Measures	Total
Renewable Energy Sources Directive	139 285	100 806	**240 091**
Energy Efficiency Directive	52 857	65 952	**118 809**
Non-EU policies	49 665	21 246	**70 911**
Recast of the Energy Performance of Buildings Directive	39 999	22 833	**62 832**
EU Emissions Trading Scheme Directive	51 490	1 811	**53 301**
F-gas Regulations	44 003	218	44 221

Union policy	Existing Policies and Measures	Additional Policies and Measures	Total
Energy Taxation Directive	37 365	0	37 365
Regulation on CO_2 from cars and vans	17 282	20 038	37 320
Effort Sharing Decision	22 953	345	23 298
End-use Energy Efficiency Directive	16 859	5 697	22 556
Other EU policies	138 083	57 688	195 771

Source: European Environmental Agency, Expert Assessment

Table 5 provides summary of distribution of policies and measures mainstreaming climate change Issues into the energy policy of the EU member states and UK.

Renewable energy sources and improvement of energy efficiency of the heating systems along with cogeneration are the most widespread PaMs regarding electricity and heating (101 measures under implementation in the countries considered).

Total number of PaMs aimed at support of all the types of renewables is 60 while number of target measures aimed at support of specific types of renewable energy sources (wind, solar, biogas etc.) varies from 11 to 18.

Improvement of the energy efficiency in buildings and industry are also the pillars of the European policy framework (166 PaMS and 47 PaMs under implementation respectively).

Table 5. Distribution of Policies and Measures Mainstreaming Climate Change Issues into the Energy Policy in EU and UK (Number of PaMs Adopted)

Domain	Focus of Sectoral Policies	Number of PaMs
Electricity & Heating	Renewables	50
	Heating systems	29
	CHP	22
	Buildings	13
Renewable Energy	All renewables	60
	Biogas	18
	Biomass	17
	Photovoltaics	11
	Wind	11
Energy Efficiency	Buildings	166
	Industry	47
Metering	Metering	7
Emission Trading System	All sectors	13
	Industry	2
Energy and Carbon Storage	Energy storage	2
	CCS	2
Programmes and Strategies Design	All measures	45
	Buildings	12
Standards and Labelling	Energy-using products	9
	Household appliances	3
Energy Management	All sectors	7
	Industry	4
Energy Audit	All sectors	6
	Large Enterprises	4
Sustainable Financing	Buildings	5
	Loans	5
	Fiscal measures	4
	Grants	3
	Third party investment	3
Sustainable Procurement	Green procurement	3

Domain	Focus of Sectoral Policies	Number of PaMs
Taxation Policy	Fossil fuels	8
	Carbon tax	7
	Electricity	3
	Energy	3
	Transport	3
Waste to Energy	Incineration	3
	Biogas	2
Agriculture	All measures	4
	Buildings	2
Fossil Fuels	Natural gas	6
	Coal	5
	Fuel oil	3
	Gasification	3
	Coal to natural gas	2
Education and Outreach	Energy experts	1
	Education	1
	Bioeconomy	1
Transport	Taxation	50
	Bio-fuels	43
	E-mobility	34
	Public transport	33
	Policies	31
	Low emission vehicles	27
	Other	19
	Railroad	19
	Eco-driving	14
	Mobility plans	13
	Bicycle Strategy	11
	Energy efficiency	11
	Financial incentives	11
	Fuel Efficiency	9
	Spatial planning	9
	Infrastructure	8
	Regulation on CO2	8
	Freight transport	7
	Intermodal mobility	7
	Modal shift	7
	Road transport	7
Other Policies	Advisory	3
	Buildings	3
	Land-use planning	3
	Public campaigns	3
	Remote work	3

Source: European Environmental Agency, Expert Assessment

2.3. Analysis of Current Status of Integration of Climate-related KPIs into Strategic-level Documents and Policies of the Energy Sector of the Republic of Moldova

Currently, climate-related indicators are not sufficiently integrated into the main regulatory documents of the energy sector of the Republic of Moldova.

Adopted sectoral policies documents use mainly indicators related to energy production and use, energy efficiency as key performance indicators.

Besides NDC2, several KPI's relevant to the low-carbon development goals are integrated into the sectoral strategic and legislative documents listed in Table 8.

2.4. Alignment of Key EU Energy and Climate Change Policies with Regulations of the Republic of Moldova

The Republic of Moldova has signed the Association Agreement with the European Union in 2014, whereby the country has also committed to aligning its climate change policies to the EU ones.

The agreement comprises binding provisions, regulatory documents and wider cooperation arrangements in all sectors of concern, including those related to GHG emissions reduction and adaptation to climate change. The cooperation is governed by the Action Plans.

The Association Agreement between the European Union and the Republic of Moldova is an important treaty that commits Moldova to economic, legal and financial reforms to converge its policies and legislation to those of the European Union. The chapter on climate change focuses on actions in six areas:

- mitigation;
- adaptation;
- carbon emission trading;
- research, development, implementation and other related issues;
- integrating climate aspects into sectorial policies;
- awareness-raising, education and training.

The Association Agreement is accompanied by an implementation Program of Action for European Integration Freedom, Democracy, Welfare, which addresses adaptation to climate change and sets the framework for the congruence of Moldovan policies with European ones.

3. OPPORTUNITIES, CHALLENGES AND RECOMMENDATIONS FOR MAINSTREAMING CLIMATE CHANGE CONSIDERATIONS INTO THE RELEVANT ENERGY SECTOR DEVELOPMENT POLICIES

3.1. Review of Current Status of Implementation of Green Economy Plans, Renewable Energy, Energy Efficiency Plans and Strategies. Key Bottlenecks to be Addressed

A number of capacity-related assessments undertaken at the national and sub-national levels, in particular at sector level, have identified gaps and constraints that cumulatively act as barriers that impede progress in adaptation planning and its implementation in the energy sector of the Republic of Moldova. The most important of them are:

- World Bank Technical Assistance Document;
- Institutional Capacity Assessment (ICA) carried out during NAP-1;
- climate change impact sectorial assessments within the NC4 to UNFCCC;
- the Climate Change Adaptation Strategy and its implementation Action Plan until 2020;
- the Technology Needs Assessment;
- development of the Republic of Moldova's Country Programme for the engagement with GCF;
- other project-based assessments undertaken by the national and external stakeholders.

These studies have revealed the energy sector-relevant barriers to effective sectorial adaptation arising from political instability, socioeconomic conditions, uncertainties of future climate as well as financial, technologic, institutional, and individual knowledge limitations.

The main systemic impediments for an increased political commitment in addressing climate change mitigation and adaptation issues in the energy sector planning process include:

- insufficient prioritization of climate change issues in the national energy policy agenda;
- insufficient knowledge of high-level decision makers in the energy sector on the magnitude of the climate change impacts and the threat to economic growth and energy infrastructure resilience;
- lack of financing;
- lack of capacity for comprehensive policy design and its implementation.

The national actors, benefiting from the engagement and the participation in the climate change global agenda, have limited awareness and knowledge of trends and opportunities presented by the global sustainable energy agenda, particularly regarding the opportunities for a range of information, tools, technical assistance, and project funding.

Current energy sector's legislation and policy papers in Moldova have the following bottlenecks:

- climate impacts are addressed insufficiently in the energy sector's legislation and policies;
- the lack of a specific reference to climate change in many laws hinders the development of mitigation and adaptation actions relevant to the energy sector of Moldova, because responsible authorities cannot request funding for climate-related activities;
- sectoral strategies do not take into account or do not relate directly climate change and energy efficiency, energy security considerations in proposed sectorial measures and objectives, even when these objectives are directly affected by climate variability and climate change.

The Tables 6 and 7 reflects the sectorial and cross-sectorial needs of the country and the priority capacity building actions to be pursued.

As a result, efforts should be made to move towards a more coordinated and integrated approach to mainstreaming climate change issues into the energy policy of Moldova (for example, by means of active involvement of the inter-sectorial Climate Change Coordination Mechanism led by the National Commission on Climate Change).

Table 6. Sector-level Climate Change Mitigation and Adaptation Barriers and Gaps of the Republic of Moldova

Sector	Enabling Environment	Organizational Environment
Energy	– Limited integration of mitigation and adaptation measures in the development plans of enterprises, national and sectorial plans (energy efficiency, renewable energy use); – Lack of climate mitigation and adaptation target requirements in the legal documents related to the energy sector; – Limited financial and institutional capacity to improve governance and implementation capacity in terms of energy efficiency and renewable energy; – Limited capacity development and training for workers and service providers (with focus in energy management, energy audit, sustainable strategic planning).	– Limited ability to provide training and exchange of experiences with other energy organizations on best practices and techniques to reduce facility vulnerabilities to climate change; – Need to improve hydro-meteorological warning systems and develop a coordination mechanism with service providers to ensure information flow in support of operational activities of the energy sector; – Limited ability to conduct economic analysis of costs and benefits of climate mitigation and adaptation interventions to support increased adoption of new technologies and approaches into the energy sector's policy planning; – Mitigation and adaptation to climate change is currently not an opportunity for employment in the energy sector.
Transport (Fuel Consumption-Related Issues)	– The financial resources of the Road Fund are not channeled into research of climate related risks and/or impact assessment, capacity or planning for the transport sector and a change in its governing laws is needed; – The technical standards for the design, construction and operation of transport infrastructure are to be adjusted to the potential impacts of climate change as well as to new modalities of urban mobility; – Inadequate methodologies for climate impact measurement of related policies, plans and available financial resources; – Insufficient management capabilities (financial, technical and commercial) in the transport infrastructure maintenance system.	– Limited technical ability to organize and create the necessary technical adaptation options to climatic events; – Lack of appropriate facilities that would allow entities to rehabilitate transport infrastructure with focus on more efficient fuel use; – Lack of an efficient national-level policies to address the removal of obsolete and non-complying vehicles from the State Register and the monitoring of scrapping operations; – Limited integration of mitigation and adaptation measures in the development plans of enterprises, national, municipal and sectorial plans related to the transport sector; – Mitigation and adaptation to climate change is currently not an opportunity for employment in the transport sector.

Source: NDC2, Expert Assessment

Table 7. Cross-sectorial Climate Change Mitigation and Adaptation Barriers and Gaps of the Republic of Moldova

Policy framework and institutional capacities	Systemic Barriers and Gaps	Organizational Barriers and Gaps	Individual Barriers and Gaps
Disaster Risk Reduction	Climate change mitigation and adaptation issues are not sufficiently mainstreamed into legislation on disaster preparedness of the energy sector of Moldova	Lack of a comprehensive strategy	Low level of awareness about measures aimed at disaster risk reduction for the energy infrastructure
National Development Policies	Climate change mitigation and adaptation issues are not sufficiently mainstreamed into national development strategies of the energy sector of Moldova	Reporting on climate-related issues in the energy sector is not consolidated. The adaptation-related "portfolio" is not seen from a holistic and programmatic approach perspective	Decision-makers in the energy sector do not perceive climate mitigation and adaptation as an important issue which requires a special attention
Economic and Sectorial Development Policies	Legislation in climate-sensitive sectors do not sufficiently address climate change mitigation and adaptation as an integral aspect of the sectoral policy	Authorities of the energy sector do not have a clear legal mandate to conduct a comprehensive work on climate adaptation	Weak integration of climate-related issues into the municipality-level energy policy
Environment Policies	Climate-related strategies are in their early stages and are not yet reflected in sectorial policies	Restructuring and shifts in program mandates often lead to low availability of program-related information There is need to prepare compelling budget requests that explain the development linkages of energy and environmental programs.	Decision-makers and staff still lack specialized knowledge to design and implement climate change mitigation and adaptation programs and plans aimed at the energy sector
Public Administration and Public Management	Climate change mitigation and adaptation portfolio is not sufficiently evaluated or monitored. Lack of ongoing support for energy sector mitigation and adaptation initiatives leads to continuity gaps	Government agencies may report on program implementation but they do not necessarily incorporate lessons learn into the future program design. Unclear alignment between agency budgeting and policy priorities	Sectorial agencies may lack the skills to analyze the energy and climate-related data they collect and utilize the findings from projects aimed at sectoral mitigation and adaptation Staff often lacks specialized training or mentoring.
Gender and Vulnerable Groups	Climate change mitigation and adaptation in the energy sector is not sufficiently mainstreamed into legislation on human health and related social services	Limited understanding of methodological approach to mainstream energy sector mitigation and adaptation at organizational level. Limited disaggregated data on climate change impact on gender issues	Low level of awareness about climate mitigation and adaptation and related practices hinder development of community resilience
Knowledge Management	Lack of guiding policies and/or strategies on knowledge management in the energy sector	Limited understanding within government and lead agencies on knowledge management in the energy sector	Climate change, its impacts are not prioritized or used in daily agenda of civil servants of the

Policy framework and institutional capacities	Systemic Barriers and Gaps	Organizational Barriers and Gaps	Individual Barriers and Gaps
			government institutions responsible for the energy policy
Communication and Public Awareness	Insufficient guiding policies and/or strategies on communication and awareness raising with regard to climate risks in the energy sector of Moldova	Limited understanding within government and lead agencies on the need for communication and awareness raising campaigns	Low level of awareness about communication practices that may improve community resilience

Source: NDC2, Expert Assessment

3.2. Recommendations for Improvement of Legal Framework

Analysis of the best practices of the EU's climate regulations shows that the main areas for strengthening the legal framework in the field of climate policy are:

- Improvement of energy efficiency;
- incentives for renewables;
- Abatement of fossil fuel use;
- Energy labelling;
- Sustainable transport policies;
- Roll-out of smart metering;
- Development of energy management and energy audits (with focus on local authorities and enterprises);
- Development of Emissions Trading System mechanisms;
- Sustainable public procurement of energy consuming goods;
- Promotion of green financing mechanisms;
- Other relevant policies aimed at improvement of energy efficiency and reduction of GHG emissions.

Table 8 summarizes key recommendations for improvements of the legal framework of the Republic of Moldova to mainstream climate change Issues into the national energy and low-carbon development polices (a detailed description of relevant policy measure is presented in the Annex 4).

Table 8. Recommendations for Improvements of the Legal Framework of the Republic of Moldova to Mainstream Climate Change Issues into the National Energy Policy

Target Area of Policy Intervention	Name of policy or measure
Fossil fuel use	Phasing out coal in energy production
	Substutution of coal to solid biofuels in residential sector
	Promotion of natural gas use in industry
	Promotion of waste-to energy technologies
	Substitution of individual oil-based furnaces
Renewables	Promote dedicated energy crops (i.e. forestation with woody crops)
	Specific support to promote biomethanisation
	Support to BIPV
	Encouraging farmers and land owners to grow biomass for energy needs
	Fostering research and development of clean energy technologies and low-carbon technologies
	Stand alone renewable energy systems
	Renewable Energy Communities
	Development of forecasting modelling tools for weather-to-energy production
	Support scheme for the installation or replacement of solar water heaters in households
	Promoting wood chips
	Informational and educational measures
Energy Efficiency	Strategy for the phasing out of fossil fuels in the buildings sector
	Financial support to rational use of energy and renewable energy systems in the residential sector
	Adoption of new technical standards for domestic boilers
	Specific support for rational use of energy initiatives for people with low incomes
	Adaptation of urbanistic regulations to facilitate the promotion of rational use of energy and renewable energy systems in the residential sector
	Financial incentives for energy renovation of buildings in public sector

Target Area of Policy Intervention	Name of policy or measure
	National Plan for the Increase of the Number of Nearly-Zero Energy Buildings
	Specific energy efficiency measures in the medical, social and education sectors
	Energy and environmental performance and indoor climatic requirements in industrial buildings
	Establishing an energy cadastre of public and private buildings
	Long Term Energy/CO_2 efficiency Agreements in the industrial and energy sector
	Energy efficiency measures for SMEs
	Energy efficiency obligation scheme in industry, services, agriculture
	Pilot projects for installing high efficiency cogeneration in public buildings
	Energy efficient street lighting
	Introduction of white certificates system in industry
Energy Management	Promoting of energy management systems in industry, commercial and public sectors
Energy audits	Supports schemes for energy audits for SMEs
Smart Metering	Smart metering infrastructure for electricity, water and heat
Emissions Trading System	Adoption of ETS mechanisms
Public procurement	Development of green procurement mechanisms and green taxonomy
Transport	Promotion of mobility plans at local level
	Modal shift to environmentally friendly transport modes
	Promotion of e-mobility
	Promote the use of bicycles
	Promote multimodal freight transport
	Promotion of car sharing
	Promotion of eco-driving
	Promotion of alternative transport and clean vehicles in public services
	Development of infrastructure for alternative fuels
	Vehicle excise duty based on CO_2 emissions
	ICAO agreement in aviation
	Adoption of EU requirements regarding biofuels
	Adoption of EU regulation on CO_2 emissions from vehicles
	Taxation of road transport
Taxation	CO2 tax on energy products
	Green Owner Tax - a fuel-efficiency-dependent annual tax on motor vehicles
	Tax deduction for energy saving in buildings
	Tax incentives for efficiency and low carbon options
Financing	Promotion of third-party financing in the public sector
	Financial incentives for rational use of energy in public buildings and agriculture
	Promotion of energy efficiency and implementation of measures through energy services model
	Financing tool providing soft loans for energy efficiency investments
	Removing barriers that impede the uptake of energy performance contracting and the implementation of energy efficiency investments
	Increasing the utilization efficiency of financial resources of residential energy efficiency programs and the utilization of credits combined with grant
	Accelerated capital allowance for energy efficient equipment
	Financial support (grants) for renewable energy technologies deployment in households
	Investment support programmes in public sector energy efficiency
	Loans for SMEs for financing energy efficiency projects
Other policies	Promoting remote work and virtual netmeting

Target Area of Policy Intervention	Name of policy or measure
	Provision of energy advisory to private consumers, SMEs, public sector
	Promotion of transition to low-carbon society in the framework of spatial planning
	Support for cross-cutting technologies
	Streamlined energy and carbon reporting framework for business

Source: Moldova's Regulations, Expert Assessment

3.3. Recommendations for Integration of Climate Change-Related Indicators into Energy Sector's Strategic Planning Framework

The Republic of Moldova, in its efforts to establish an integrated National Adaptation Planning process at the national level and Sectoral Adaptation Planning process at sector level, has aligned the functionality of Climate Change Adaptation Monitoring and Evaluation (M&E) System to the planning cycle of NAPs and SAPs.

The proposed Monitoring & Evaluation framework is based on the need to monitor progress towards achieving the country's climate-resilient economic growth. Using a sectoral planning approach aligned to NAP approach requires monitoring of sector-based activity as well as their aggregate impact on the overall country's economy and further communication of adaptation efforts at sectoral and national levels.

The goal of the M&E system in terms of the energy sector is to ensure the measurability of progress across geographic scales, time, and to be able to determine whether, as a result of its successive plans, the Republic of Moldova is less vulnerable to the impacts of climate change.

The proposed M&E framework would allow for monitoring and planning along a 3-tier approach:

- micro-level monitoring is targeted at assessing the adaptation result of individual actions in the energy sector (i.e. at the output level);
- meso-level monitoring allows for tracking of adaptation achievements at the outcome level;
- macro-level monitoring is conceived to evaluate or periodically assess the global, cumulative impact of sectoral adaptation actions.

With respect to the energy sector, the M&E system for the Republic of Moldova's adaptation component was designed to serve the following purposes:

- create a set of overarching adaptation goals to which the energy sector will contribute, track and monitor individual sectoral objectives and indicators;
- allow for iterative sectoral policy planning and continuous, evidence-based adaptation planning;
- enforce the gradual integration of adaptation priorities in regular sectoral development planning;
- ensure transparency of the adaptation process and sectoral data collection;
- measure and monitor the outcomes and impacts of adaptation activities, investments, programmes on gender resilience to climate change from a gender-responsive perspective.

Through the M&E system, the National Commission on Climate Change will monitor:

- progress and evaluate impacts of implemented policies;
- implementation of adaptation related planning;
- development and dissemination of adaptation related knowledge and research, including guidance materials, methodology, tools and instruments;
- implementation of adaptation technologies and practices;
- adaptation related financing and investments, including the external support received;

– adaptation related quality assurance process.

The reporting system adopts an indicator-based reporting format at different levels, consisting of indicators for tracking and evaluating the success of adaptation support and adaptation interventions.

Given its crosscutting nature, the adaptation action requires mobilization of internal and external financial resources, as well as scaling up national investments in climate finance, from both public and private sources. Therefore, as part of the M&E system, in the Republic of Moldova, a Climate Budget Tagging (CBT) process is under implementation, that aims at improving the understanding of how and how much is being spent on national climate change responses, through which programs funds are being spent, and which programs include climate change objectives (or co-benefits). This process supports the ability of the authorities of Moldova to track climate expenditures and improves their ability to ensure progress on climate change as related to the country's national development goals and international commitments.

Under the CBT tracking system, it is proposed that the monitoring of sectoral (including energy sector) work plans is based on output indicators at the activity level and outcome indicators at the programme level.

Table 9 provides a summary of recommendations for improvements of climate change mitigation and adaptation monitoring and evaluation process in the energy sector of the Republic of Moldova

Table 9. Recommendations for Improvements of Climate Change Mitigation and Adaptation Monitoring and Evaluation Process in the Energy Sector of the Republic of Moldova

Climate Change Mitigation and Adaptation Monitoring, Reporting and Evaluation Priorities	Actions toSsupport Implementation of Activity
Increase the efficiency for delivering climate goals and finances at the national level through operationalization of the M&E system in support to the Coordination Mechanism	Enforcement of Government Decision on CCCM, including M&E system
Use existing or develop new methods and tools to measure, monitor and report on the country's mitigation and adaptation commitment made under the current NDC	Apply the M&E system to measure the progress of implementation of adaptation component of NDC.
Develop an evaluation framework to capture how well climate risk management is integrated into national and sub-national development.	Evaluate the extent of climate risk management integration into development policy and planning
Evaluate country's institutional level capacities to address mid- and long-termenergy sector's mitigation and adaptation issues	– Assess institutional flexibility and resilience to respond to climate change and related risks uncertainty; – Undertake qualitative assessments of the management competency and performance of state institutions, climate-related agencies in addressing climate risks and related issues; – Climate risk management by key national and local authorities.
Operate the indicator-based system through the Climate Change Adaptation Information System components	Full operation of the portal presenting public information related to the energy sector
Apply the indicator-based reporting and monitoring system to evaluate	– the extent to which the mitigation and adaptation intervention has reduced the vulnerability of individuals and households to hazards associated to the energy sector with climate variability and change; – the extent to which the adaptation intervention has increased the resilience of the energy sector and natural/managed systems on which population depends;

Climate Change Mitigation and Adaptation Monitoring, Reporting and Evaluation Priorities	Actions toSsupport Implementation of Activity
	– the extent to which the adaptation intervention has helped the country to maintain the development performance and to reach SDGs.
Assess and track progress under the successive NAPs, SAPs through monitoring and measuring	– the attainment of the overarching adaptation goals and objectives for the energy sector; – the enforcement of the gradual integration of adaptation priorities in regular development of planning, the implementation of adaptation related planning and the impacts of implemented policies, including guidance materials, methodology, tools and instruments; – the development and dissemination of adaptation related knowledge and research; – the transparency of the adaptation process and data collection; – the outcomes and impacts of NAP/SAP adaptation activities; investments, and programmes on resilience to climate change, including from a gender-responsive perspective.
Monitor the implementation of adaptation technologies and practices	Monitor and assess the contribution of the programme or project to country's priorities for climate-resilient development and demonstration of low-emission development co-benefits.
Monitor adaptation related financing and investments, including adaptation-related external support received.	Use the climate tagging of the national public budget for public scrutiny of government and donor spending on tackling climate change issues and generating data on climate investments.

Source: Moldova's Regulations, Expert Assessment

Inclusion of the following set of energy and climate-related indicators would provide a comprehensive approach to design a transparent and comprehensive framework for tracking progress of policies adopted:

Energy Supply and Consumption Indicators

- Net energy imports;
- Coal imports;
- Total energy supply by source;
- Total energy supply by GDP;
- Total energy supply by GDP (PPP);
- Total energy supply per capita;
- Total final consumption by source;
- Total final consumption by sector;
- Coal final consumption by sector;
- Coal final consumption by type;
- Oil products final consumption by sector;
- Oil final consumption by product.

Electricity and Heat Indicators

- Electricity generation by source;
- Electricity imports and exports;

- Electricity consumption;
- Electricity consumption per capita;
- Electricity consumption by sector;
- Share of renewables, low-carbon sources and fossil fuels in power generation;
- Low-carbon electricity generation by source;
- Renewable share (modern renewables) in final energy consumption;
- Heat generation by source;
- Heat generation from renewables and waste by source.

Greenhouse Gases Emissions and Carbon Intensity

- Total CO_2 emissions;
- CO_2 emissions per capita;
- CO_2 emissions per unit of GDP;
- CO_2 emissions per unit of GDP (PPP) ;
- CO_2 emissions per unit of GDP;
- CO_2 emissions drivers;
- CO_2 intensity of energy mix;
- CO_2 intensity of power;
- CO_2 emissions by energy source;
- CO_2 emissions from electricity and heat by energy source;
- CO_2 emissions from electricity generation factors;
- Final energy carbon intensity ;
- Carbon intensity of industry consumption;
- Carbon intensity of road consumption.

3.4. Recommendations for Strengthening Institutional and Cross-cutting Capacities

The following institutional and cross-cutting capacities play an important role in building a comprehensive energy and climate policy.

- institutional framework;
- budget mainstreaming;
- climate risk management;
- climate adaptation mainstreaming;
- climate awareness and mainstreaming;
- climate knowledge and training;
- spatial (urban, rural, land) planning.

Table 10 provides a set of recommendations for cross-cutting institutional and capacity development of the Republic of Moldova to mainstream climate change Issues into the national energy policy.

Table 10. Recommendations for Cross-cutting Institutional and Capacity Development of the Republic of Moldova to Mainstream Climate Change Issues into the National Energy Policy

Capacity category	Identified need	Intervention needed	Indicators
Institutional framework	A need for improvement of interagency communication in terms of national climate and energy policy design and implementation	Creation of strong interagency communication and coordination platform aimed at coordinated implementation of energy sectoral policies to strengthen its climate mitigation and adaptation impact	Number of policies adopted or coordinated; number of KPI's monitored by the coordination platform
Budget mainstreaming	Develop options for climate resilience and how to best formulate budget lines for climate resilience in the national plans for the energy sector and annual Ministerial Strategies	Climate considerations integrated in budgets of the energy sector	Climate change indicators incorporated into planning and budgeting frameworks to ensure accountability
		Incorporate contingency budgets in each sector for specific CCA interventions as the need arises	Contingency budget in the energy sector for specific adaptation interventions
Risk management information and technologies	Develop a climate related knowledge management strategy	Knowledge management strategy in place	Relevant document completed
	Hazard and risk mapping	Mapping of hazards	Climate hazards maps
	Evaluation of current data collection and dissemination practices and experiences	Evaluation and documentation of lessons and best practices related to current practices and experiences	Lessons learnt document that collates and disseminates CCA related information requirements
Adaptation mainstreaming	Incorporate climate mitigation and adaptation into environmental impact assessments guidelines for the energy sector	EIA process guidelines	Completed integration of climate considerations into EIA process guidelines
	Analytical process to examine policies, plans or program from a climate perspective for the energy sector	Energy sector-specific climate screening tools to identify projects at risk criteria for selecting projects for implementation and financing	Climate screening tools to identify projects at risk. Prioritized (annual) list of climate related resource requirements
	Priorities and approaches for climate -related development planning for the energy sector	Energy sector- based approaches for integration of climate issues into sectoral development plans	Sectoral climate priorities established Relevant documents completed
Climate awareness and mainstreaming	Key messages for the different groups of stakeholder in the energy sector about climate resilience	Formulate a set of key messages for the different groups of stakeholders in the energy sector about climate resilience and the specific actions that can be taken immediately	Relevant documents completed and sectoral programs initialized
		Climate- related sectoral risk profiles	Climate- related sectoral risk profiles completed and programs initialized
Climate knowledge and training	Sectoral training institutions mapped and climate-related training programs developed	Map and identify sectoral training institutions and develop climate- related training programs	Number of sectoral education programs that can incorporate climate change

Capacity category	Identified need	Intervention needed	Indicators
		Climate considerations integrated in sectoral education curricula, taking into consideration gender aspects	Number of sectoral education programs that integrate climate into curricula
	Training for staff on leadership, coordination, mainstreaming, communication and project management	Identify/designate mentors and coaches among officials/staff	Established roster of trained climate mentors and coaches for each sector
		Train identified mentors and coaches on climate issues	Number of participants in mentors and coaches' trainings
	Training on climate change, risks and vulnerability with the Academy of Public Administration	Training for local governments on opportunities for making use of climate policies and conducting vulnerability assessment activities	Number of local governments that participated in training events
Spatial (urban, rural, land) planning	Mapping settlements vulnerable to extreme weather event (flooding, landslides and other hazards) with high potential impact on energy infrastructure	Mapping of vulnerable settlements	Settlement vulnerability maps available to all sectors for incorporation into sectoral action plans Map of vulnerable settlements
		The responsible authority initiates integrated planning around geographically vulnerable areas to produce high-quality development plans for disaster-prone areas to mitigate risks for the energy infrastructure	
	Review, update and develop urban and spatial plans of localities	Updated urban and spatial plans of localities	Updated urban and spatial plans of localities
	Develop codes and regulations for limiting of residential and commercial facilities and homes in areas vulnerable to hazards to the energy infrastructure	Codes and regulations for residential and commercial facilities and homes in areas vulnerable to hazards	Codes and regulations for residential and commercial facilities and homes in vulnerable areas
	Develop urban and rural post-disaster redevelopment plans	Post-disaster redevelopment plans	Post-disaster redevelopment plans prepared

Source: Moldova's Regulations, Expert Assessment

3.5. Recommendations for Strengthening Role of International Organizations and International Financial Institutions in Mainstreaming Climate Change Issues into Energy Policy, Technology Transfer and Green Market Development

Lack of financial resources is considered one of the key barriers for reaching ambitious sustainable development targets of the Republic of Moldova. Development and operation of various financing instruments at national level is a mandate assigned by law to Energy Efficiency Agency. However, due to various reasons (lack of finance, low energy tariffs, high interest rates for funding provided by local banks etc.), the financing services market for the energy sector is not developed yet.

As a result of high investment needs, availability of financial support technical assistance from international financial institutions and international development agencies will play a crucial role to ensure implementation of comprehensive energy and climate policy of Moldova.

Currently the Government of the Republic of Moldova accesses finance from the international financial institutions and international organizations on preferential terms through various financial instruments:

- credit schemes;
- grants;
- subsidies.

Interest rates on these preferential funding are low or not applied under the grants and subsidy conditions. The repayment period of loans is several times longer than the one applied to commercial loans, many of the loans also having grace periods.

In last decade, the largest disbursements through the projects with climate-related targets were made by UNDP, the European Union, World Bank, European Investment Bank, EBRD.

Table 11 provides a summary of energy and climate-related project portfolio of international organizations and IFIs in the Republic of Moldova.

Table 11. Energy and Climate-Related Project Portfolio of International Organizations and IFIs in the Republic of Moldova

Impact Areas	UNDP	WB	EBRD	EIB
Biomass	X	X	X	
Climate adaptaion and mitigation	X	X		
Climate risks	X			
District heating		X	X	
Energy efficiency	X	X	X	X
Gas			X	X
GHG emission reduction	X			
Policies		X		
Power systems		X	X	X
Renewables		X		
Sustainable urban development	X			
Capacity building	X			

Source: IFIs, UNDP, Expert Assessment

Among other important players which also contributed to technical assistance projects and provision of commercial financing and grants in energy and climate portfolio worth mentioning such institutions as:

- Swiss Agency for Development and Cooperation;
- European Commission;
- GIZ;
- USAID;

- Governments of Romania and Sweden.

Promotion of energy efficiency and renewable sources is considered the first priority for the energy sector of Moldova where strong support from international institutions is hjghly encouraged. In this regard, the existing regulatory framework provides for the support of foreign and domestic investors in electricity generation installations from wind, photovoltaic, biogas and solid biomass cogeneration plants by granting fixed tariffs and a fixed price.

It is also expected that the investments in transport infrastructure will increase the resilience of the sector, reduce fuel consumption, provide essential gains for public security, as well as substantial economic revenues. The assessment undertaken in transport sector points to the need for enormous investments in the physical infrastructure, but also for associated measures, such as institution and policy change, capacity building and development of strategic documents for the Republic of Moldova to adapt and build resilience to climate change.

The prioritization criteria for climate investment to support mitigation and adaptation in the energy sector of Moldova should meet the following national priorities:

- alignment with the country's climate change sectoral mitigation and adaptation strategies and plans as well as with the country's legislation;
- contribution to vulnerability reduction at the national level and increase in climate-resilient sustainable development of the energy infrastructure;
- contribution to transformational adaptation of the energy sector;
- contribution to improved economic performance with high level of environmental, social, and gender co-benefits;
- financing needs of vulnerable groups, target population, sectors, development regions, country;
- financial and economic feasibility based on which sectorial investment options have been prioritized;
- total number of direct and indirect beneficiaries.

3.6. Recommendations for Strengthening Municipal Planning Polices

Comprehensive energy policy is highly dependent on its successful implementation at local (municipal) level.

The Republic of Moldova has already adopted various regulations promoting energy efficiency, renewable energy roll-out by municipalities.

For example, through the draft Government Decision on approving the Regulation on the framework content, the methodological principles for developing and updating, and approving the National Territory Planning Plan (NTPP) the development of the basic set of documents on balanced and sustainable strategic planning of the territory at the country level and on spatial planning will be ensured, in accordance with the objectives of social, economic, cultural and ecological priorities of the country.

Besides that, the Covenant of Mayors on Climate and Energy plays an important role in promotion of sustainable territorial planning with strong focus on climate mitigation and adaptation.

Table 12 provides an overview of the current status of adoption of sustainable energy and climate action plans by cities and villages of the Republic of Moldova and their commitments to reduce GHG emissions.

Although 26 cities and villages have already submitted their SEAP's/SECAP's, about 40 other cities in Moldova have not joined CoM agreement yet. Candidate cities for adoption of SECAPs are: Chișinău, Tiraspol, Bender, Rîbnița, Cahul, Orhei, Comrat, Dubăsari, Ceadâr-Lunga, Edineț, Vulcănești, Durlești, Hîncești, Fălești, Codru, Taraclia, Florești, Sîngerei, Slobozia, Grigoriopol, Dnestrovsc, Basarabeasca, Rîșcani, Glodeni, Camenca, Rezina, Leova, Cricova, Dondușeni, Briceni, Otaci, Ștefan Vodă, Cupcini, Sîngera, Criuleni, Telenești, Șoldănești, Tvardița, Lipcani.

As a result, there is a high potential for strengthening the role of this agreement in mainstreaming climate change issues into sustainable development policy of cities of Moldova.

Table 12. Current Status of Adoption of Sustainable Energy and Climate Action Plans by Cities and Villages of the Republic of Moldova

Signatories	Population	Commitments (Overall CO_2 emission reduction target, %)	Signed up	Action plan
Albineţul Vechi	2 423	40%	2020	2021
Anenii Noi	13 856	20%	2012	2014
Budeşti	5 040	40%	2018	2019
Bălți	151 000	87%	2016	2014
Cantemir	6 300	20%	2013	2014
Cimişlia	14 800	20%	2011	2016
Călărași	16 100	20%	2012	2013
Căușeni	15 939	48%	2014	2014
Drochia	87 083	20%	2010	2014
Feștelița	3 111	20%	2013	2014
Ialoveni	15 300	42%	2016	2017
Mereni	5 757	40%	2021	2021
Nisporeni	64 945	31%	2018	2021
Ocnița	9 170	20%	2012	2014
Pruteni	2 140	30%	2020	2020
Sireti	5 778	30%	2020	2021
Soroca	37 400	20%	2012	2014
Strășeni	18 376	20%	2021	2018
Stăuceni	8 694	20%	2017	2021
Talmaza	6 341	40%	2019	2021
Tomai	5 030	40%	2020	2021
Ungheni	36 000	35%	2012	2014
Vișniovca	1 603	30%	2018	2021
Vorniceni	5 220	30%	2018	2021
Zubrești	2 985	61%	2018	2021
Șoldanești	6 278	20%	2012	2016

Source: Covenant of Mayors

4. RECOMMENDATIONS FOR FURTHER DEVELOPMENT OF NATIONAL PRACTICES OF GREENHOUSE GASES EMISSIONS MEASUREMENT AND REPORTING IN THE ENERGY SECTOR TAKING INTO CONSIDERATION THE BEST PRACTICES

The United Nations Framework Convention on Climate Change (UNFCCC) was adopted on May 9, 1992 at the UN Conference on Environment and Sustainable Development in Rio de Janeiro, being regarded as a response of the international community to the global warming phenomenon caused by air pollution and the increased concentrations of greenhouse gases (GHG). The Republic of Moldova signed the UNFCCC on June 12, 1992 and it was ratified by the Parliament on March 16, 1995.

Article 4, paragraph 1(a) and Article 12, paragraph 1(a) of the UNFCCC stipulate that each Party has to make available to the Conference of the Parties (COP) 'a national inventory of anthropogenic emissions by sources and removals by sinks, of all greenhouse gases uncontrolled by the Montreal Protocol, to the extent its capacities permit, using comparable methodologies to be agreed upon by the Conference of the Parties; also a general description of steps taken or envisaged by the Party to implement the Convention; and any other information that the Party considers relevant to the achievement of the objective of the Convention and suitable for inclusion in its communication, including, if feasible, relevant data for calculations of global emission trends'.

The COP 17 that took place in Durban in 2011 adopted the UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention (Decision 2/CP.17 and Annex 3 to this Decision). According to this decision, developing countries, non-Annex I Parties, consistent with their capabilities and the level of international support provided for reporting, were expected to submit their first BUR to the Secretariat of the UNFCCC by December, 2014. The Report should be submitted to the Secretariat at every two years as a stand-alone report or as a summary of the National Communications, should their reporting years coincide.

On March 4, 2020, the Republic of Moldova presented the updated version of its NDC to the UNFCCC Secretariat. According to it, the Republic of Moldova intends to step up with much more ambitious GHG emission reduction targets regarding by 2030. The unconditional target is thereby to increase from 64-67 per cent to 70 per cent compared to the base year (1990), and the conditional target is to increase from 78 per cent to circa 88 per cent compared to the base year (1990).

The new GHG emission reduction targets are to be introduced into the Low Emissions Development Programme until 2030 and the Action Plan for its implementation.

Consequently, further development of GHG emissions accounting in the energy sector of the Republic of Moldova should be aligned with international commitments of the country according to the Paris Agreements.

Institutional Arrangements for the National Monitoring and Reporting System of the Republic of Moldova

The further development of national practices of GHG measurement and reporting in the Energy Sector of the Republic of Moldova implies an active involvement of competent authorities in this process.

The list of competent authorities and institutions which are currently involved into process of GHG emissions accounting or collection and submission of relevant data are designated by Annex No. 2 to GD No. 1277 of 26.12.2018 and it comprises:

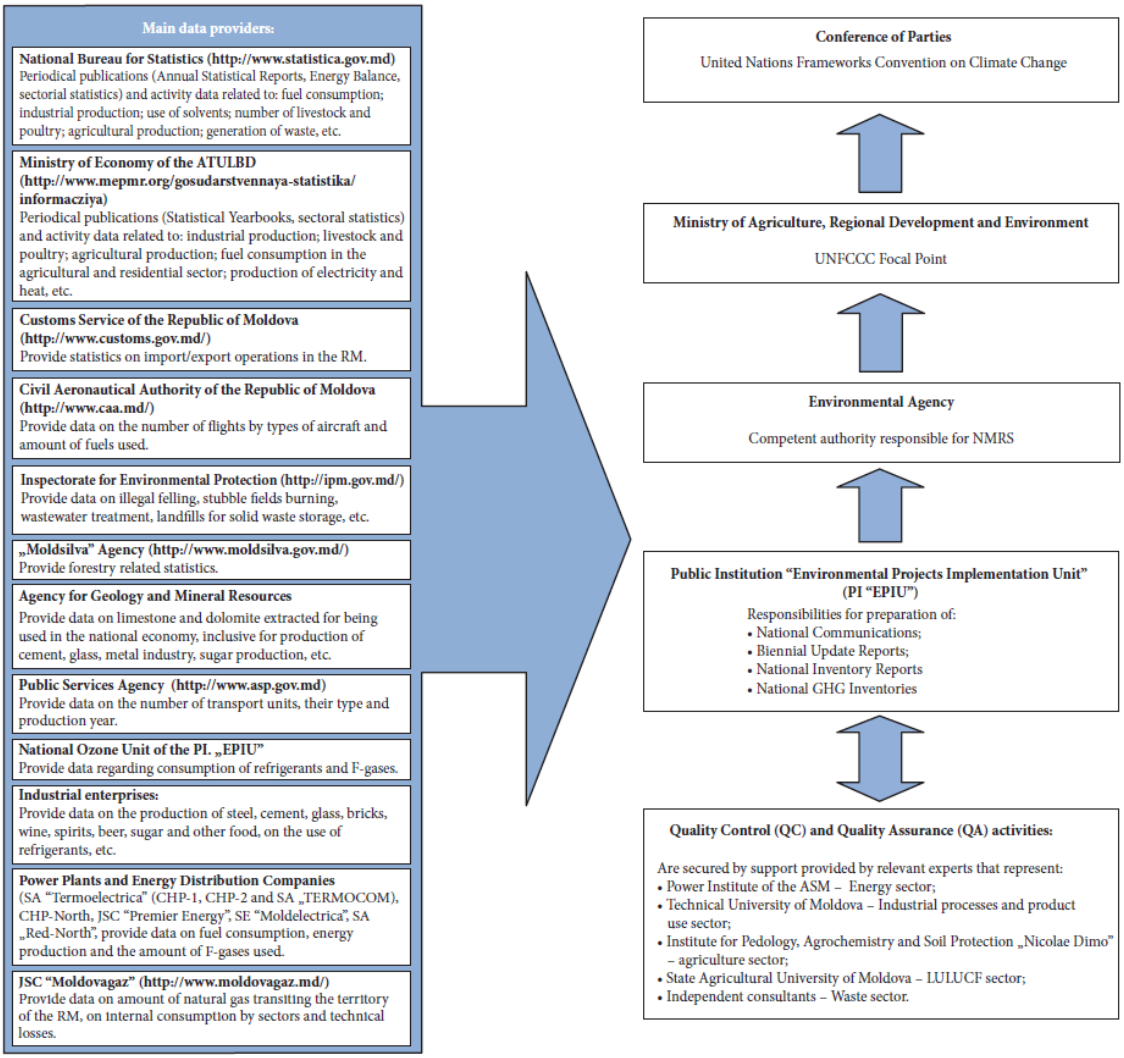
- Specialized central public authorities;
- Public authorities subordinated to ministries;
- Central public authorities;
- State owned companies and joint stock companies subordinated to specialized public authorities and companies with shares of state-owned capital;

The following companies currently play an important role in providing data needed for calculation of GHG emissions in the Energy sector:

- "Moldovagaz";
- "Moldelectrica";
- "RED-NORD";
- "TERMOELECTRICA";
- "CET-Nord";
- "Moldovan Railways".

In perspective, the role of these organizations in collection and distribution of GHG emissions data can be strengthened.

Figure 1. Institutional Arrangements for the National Monitoring and Reporting System of the Republic of Moldova



Estimated Overall National Inventory Quantitative Uncertainty in the Republic of Moldova

Uncertainty estimates are an essential element of a complete and transparent emissions inventory. Uncertainty information is not intended to challenge the validity of inventory estimates, but to help prioritize efforts to improve the accuracy of future inventories and guide future decisions on methodological choice.

Some of current estimates, such as those for GHG emissions from fossil fuels combustion are considered to have minimal uncertainty associated with them.

Additional research in the following areas could help reduce uncertainty in the Republic of Moldova's Inventory in the Energy Sector:

- ***Improving the accuracy of emission factors***. Further research is needed in some cases to improve the accuracy of emission factors used to calculate emissions from a variety of sources (for example, the accuracy of current emission factors applied to CH_4 fugitive emissions from oil and natural gas);
- ***Collecting more detailed activity data***. Although methodologies for estimating emissions for some sources exist, problems arise in obtaining activity data at a level of detail in which aggregate emission factor can be applied.

Emission Factors and Other Relevant Parameters used to Estimate GHG Emissions from Energy Sector

In order to estimate emissions from all source categories within Energy Sector, a large amount of detailed information on fuel consumption is needed.

According to the approach used in the Republic of Moldova, the main source of information are the Energy Balances of the Republic of Moldova, provided annually by the National Bureau of Statistics.

For natural gas, country specific net annual average caloric values are used, thus emissions from combustion of this particular type of fuel are estimated using a Tier 2 approach.

For Road Transportation, GHG emissions are estimated using a Tier 3 approach (the COPERT 4.9 model program is tested).

Further research work is needed to increase the accuracy of data collection on company- and installation levels to approach procedures to those applied in EU member states.

Figure 2. Emission Factors and Other Relevant Parameters used to Estimate GHG Emissions from Energy Sector

Fuel Type	Net Caloric Value (CS Values), TJ/kt		Net Caloric Value, TJ/kt		Emission Factors, t C/TJ		Carbon oxidation fraction	
	Ranges according to the BNS	Value used	IPCC, 1997	IPCC, 2006	IPCC, 1997	IPCC, 2006	IPCC, 1997	IPCC, 2006
Coal	15.40 - 29.13		18.58				0.98	1
Anthracite	22.83 - 29.13		18.58	26.7	26.8	26.8	0.98	1
Brown Coal, including:	6.31 - 15.37		14.65	11.9	27.6	27.6	0.98	1
from Donetsk Coal Basin	25.70	25.70			26.8		0.98	1
from Kuznetsk Coal Basin	25.44	25.44			26.8		0.98	1
from Ukrainian Coal Basin	6.31 - 11.68	11.68			27.6		0.98	1
from Kansk-Acinsk Coal Basin	15.14	15.14			25.8		0.98	1
Coal Briquettes	17.75	17.75		20.7	25.8	26.6	0.98	1
Coking Coal	26.41 - 29.05	26.41	18.58	28.2	25.8	25.8	0.98	1
Diesel Oil	42.54	42.54	43.33	43.0	20.2	20.2	0.99	1
Fuel for Oven	42.54	42.54			21.1		0.99	1
Residual Fuel Oil	39.02 - 40.20	40.20	40.19	40.4	21.1	21.1	0.99	1
Fuel for Engines	41.96	41.96			20.0		0.99	1
Including Jet engines	43.13				19.5		0.99	1
Aviation Gasoline	43.72	43.72	44.80	44.3	18.9	19.1	0.99	1
Gasoline	43.72	43.72	44.80	44.3	18.9	18.9	0.99	1
Kerosene	43.13	43.13	44.75	43.8	19.6	19.6	0.99	1
Lubricants	42.19	42.19	40.19	40.2	20.0	20.0	0.99	1
Bitumen	39.61	39.61	40.19	40.2	22.0	22.0	0.99	1
Other Oil Products	40.19	40.19	40.19	40.2	20.0	20.0	0.99	1
Natural Gas	33.15 - 34.03	33.86	33.70	48.0	15.3	15.3	0.995	1
Liquefied Petroleum Gases	46.06	46.06	47.31	47.3	17.2	17.2	0.99	1
Fuel Wood	12.32	12.32	15	15.6	29.9	30.5	0.98	1
Agricultural Residues	14.67	14.67	15.2		29.9		0.98	1

Uncertainty of Relevant Energy Statistics for Left Bank of Dniester

Some statistical data needed for calculations of GHG emissions in the Energy sector are not available for Left Bank of Dniester territories of Moldova. Coping with this gap may increase considerable the accuracy of GHG emissions accounting for the whole country.

Figure 3. Current Availability of Relevant Energy Statistics for Left Bank of Dniester

Source Categories	RBDR	LBDR	Statistical data for the LBDR, by fuels and the period for which data are available
1A1. Energy Industries	*	*	
1A1a. Main Activity Electricity and Heat Production	*	*	
1A1ai Electricity Generation	*	*	Coal, Residual Fuel Oil:1990-1998, 2008-2019; Natural Gas: 1990-2019
1A1aii Heat and Power Generation	*	NO	Not Occurring
1A1aiii Heat Plants	*	*	Coal, Residual Fuel Oil: 1990-1998, 2008-2019; Natural Gas: 1994-2019
1A1b Petroleum Refining	*	NO	Not Occurring
1A1c Manufacture of Solid Fuels and Other Energy Industries	*	NO	Not Occurring
1A2. Manufacturing Industries and Construction	*	*	Natural Gas: 1994-2019; Coal, Residual Fuel Oil: 2008-2019; LPG: 2011-2019
a. Iron and Steel	*	*	
b. Non-Ferrous Metals	*	*	
c. Chemicals	*	*	
d. Pulp, Paper and Print	*	*	
e. Food Processing, Beverages and Tobacco	*	*	
f. Non-Metallic Minerals	*	*	
g. Transport Equipment	*	*	
h. Machinery	*	*	
i. Mining and Quarrying	*	*	
j. Wood and Wood Products	*	*	
k. Construction	*	*	
l. Textile and Leather	*	*	
m. Non-specified Industries	*	*	
1A3. Transport	*	*	
a. Civil Aviation	*	NO	Not Occurring
b. Road Transportation	*	*	Natural Gas, LPG: 2009-2019
c. Railways	*	*	
d. Water-borne Navigation	*	*	
e i. Pipeline Transport	*	*	
e ii Transport Off-road Transport	NA	NA	
e iii Other Transport	NO	NO	

Source Categories	RBDR	LBDR	Statistical data for the LBDR, by fuels and the period for which data are available
1A4. Other Sectors	*	*	
a. Commercial/Institutional	*	*	Natural Gas: 1999-2019, LPG: 2011-2019; Coal, Residual Fuel Oil: 2008-2019
b. Residential	*	*	Natural Gas, LPG: 1995-2019; Fuel Wood: 2008-2019
c i. Agriculture/Forestry/Fishing (stationary)	*	*	Coal, Residual Fuel Oil: 2008-2019
c ii. Agriculture/Forestry/Fishing (mobile)	*	*	Gasoline, Diesel Oil: 1995-2019
1A5. Other	*	*	
a. Mobile	*	*	Coal, Residual Fuel Oil: 2008-2019
b. Stationary	*	NO	Not Occurring
1B. Fugitive Emissions from Fuels	*	*	
1B1. Solid Fuels	NO	NO	
a. Coal mining	NO	NO	
b. Solid Fuel Transformation	NO	NO	
c. Other	NO	NO	
1B2. Oil, Natural Gas and Fugitive Emissions from Energy Production	*	*	
a. Oil	*	NO	Not Occurring
b. Natural Gas	*	*	
c. Venting and Flaring	*	*	
d. Other	NO	NO	
1C. CO_2 Transport and Storage	**NO**	**NO**	
1. CO_2 Transport	NO	NO	
2. CO_2 Transport Injection and Storage	NO	NO	
3. Other	NO	NO	
Memo Items: [1]	*	**NO**	
International Bunkers	*	NO	
International Aviation	*	NO	Not Occurring
International Marine Navigation	NO	NO	
Multilateral Operations	NO	NO	
CO2 Emissions from Biomass	*	*	Fuel Wood: 2008-2019
CO2 Captured and Stored	NO	NO	
For storage at national level	NO	NO	
For storage in other countries	NO	NO	

Planned Improvements in National-level GHG Emissions Calculation in Energy Sector

Currently various measures are considered to improve the accuracy of GHG emissions calculation for the Energy Sector of the Republic of Moldova and enhance the quality of the National GHG Inventory.

The key measures considered are presented in the table below.

Table 13. Planned Improvements in National-level GHG Emissions Calculation in Energy Sector

Source Category	Possible Improvements
1A1 'Energy Industries'	Potential improvements within the 1A1 'Energy Industries' category could be possible once ***new data regarding the fuel consumption for electricity and heat generation on the territory of the LBDR*** are available (***filling the gaps for certain years***). Also, another potential improvement could be identifying ***additional data sources or updating data from official statistical publications***.
1A2 'Manufacturing Industries and Construction'	Potential improvements within category 1A2 'Manufacturing Industries and Construction' regarding fuel consumption for energy purposes could be possible once the ***updated data regarding the fuel consumption for the territory on the LBDR is available***. In particular, ***another approach to restore activity data for the territory on the LBDR is possible***.
1A3a 'Civil Aviation'	For 1A3a 'Civil Aviation' source category, the consumption of aviation gasoline can be found expressly only for the years 1990, 1993 and 1998. At the same time, the consumption of fuels such as: aviation gasoline, kerosene, motor gasoline and other petroleum products can be found within source categories 1A2 'Manufacturing Industries and Construction' and 1A3b 'Road Transportation'; which is usually assigned to source category 1A3a 'Civil Aviation'. There are also a series of activity data associated with aviation gasoline consumption for the years 2011-2019, provided by the Civil Aeronautical Authority of the Republic of Moldova. ***This has allowed the reconstruction by the interpolation method and/or by reallocations of fuel consumption within source category 1A3a 'Civil Aviation' from other source categories.*** The national inventory team is ***aware of the inconsistency of activity data associated with aviation gasoline consumption*** (data being collected from two separate reference sources); however, this ***inconsistency would be difficult to eliminate at the moment***. In the next inventory cycle, ***various options shall be analysed in order to improve the quality of the national greenhouse gas inventory from the respective source category.***

Source Category	Possible Improvements
1A3 'Transport'	Potential improvements within category 1A3 'Transport' could be possible once ***updating the available data on real fuel consumption in the ATULBD for each source of emissions***. Regarding source category 1A3b 'Road Transportation', ***potential improvements could be regarding the collection of additional data necessary for the use of the COPERT 4.9 model for the entire period*** (1990-2019). Also, for source categories 1A3a 'Civil Aviation' and 1A3c 'Railways', it would be possible ***to use higher- tier methods (Tier 2b, and Tier 2, respectively), but since these sources are not key categories, this activity is not cost-efficient and cost-effective for the national inventory team.***
1A4 'Other Sectors'	**Potential improvements within the 1A4 'Other Sectors' category could be possible *by updating the available data on fuel consumption on the territory of the LBDR and filling the existing gaps for certain years.***
1A5 'Other'	Potential improvements in 1A5 'Other' category could be made should ***new data be available regarding fuel consumption on the LBDR and additional information provided by the Ministry of Defence on fuel combustion for the operation*** of military transport for the years 2017-2019.
1B2 'Fugitive Emissions from Oil and Natural Gas'	Potential improvements within this source category could be possible should ***new data related to fugitive leaks from oil and natural gas distribution networks be available*** (from ***the infrastructure needed to produce, collect, process, refine and distribute oil products and natural gases to final consumers; from equipment functioning, evaporation and flashing losses, flaring, accidental releases from pipeline dig-ins***, etc.); respectively, in the case of ***adopting a higher-ranking assessment methodology.*** The possibility to obtain data associated to ***LPG consumption on the LBDR for the entire period also needs to be estimated***.
'International Aviation'	Within source category 'International Aviation', potential improvements could be achieved once a higher methodology is used (for example, a ***Tier 3 approach available in the EMEP/EEA Air Pollutant Emission Inventory Guidebook (2019),*** which considers the real values of emissions for ***each type of aircraft depending on the flight distance.***
'CO2 emissions from biomass'	Potential improvements within the 'CO2 emissions from biomass' could be achieved by collecting new available ***data on fuel consumption on the territory of the LBDR and filling the existing gaps for certain years.*** ***From 2015, the Energy Balances of the Republic of Moldova are published in a new format – according to the common framework for the production, transmission, assessment and dissemination of comparable statistics in the energy sector within the Energy Community***, as established ***at the international level by (EC) Regulation No.1099/2008 of the European Parliament and the Council from October, 22, 2008 on energy statistics, with further amendments, while at the national level, by the Decision of the National Bureau of Statistics College No. 6/3 from December, 23 2014.*** In the Energy Balances for 2015/2016, ***the data on biofuels consumption and waste in the residential sector (by population) were revised***. The recalculation was carried out with the support of the Energy Community experts and the results were obtained within the 'Research on household energy consumption' developed by the NBS of the Republic of Moldova in 2015. The significant ***increase of CO2 emissions from biomass in recent years is due, on one hand, to a stricter evidence of biomass consumption, while on the other hand, to the use of a different method of recording the energy consumption in households***, but only for 2014-2019 time series. ***Expanding this method for the remaining years (1990-2013) covered by the national inventory would allow for more substantial improvements within the category 'CO2 emissions from biomass' (Memo Items).***

Adoption of International MRV Standards

Considerable improvements on GHG emissions accounting in the Republic of Moldova can be achieved by use of key ISO Standards for monitoring, reporting and verification of GHG emissions, mentioned in the table below.

Table 14. Key ISO Standards for Monitoring, Reporting and verification of GHG Emissions

Standard Number	Standard Title	ICS	TC	Stage	Edition	Sustainable Development Goal(s)
ISO 14050:2020	Environmental management — Vocabulary	01.040.13, 13.020.10	ISO/TC 207	Published (60.60)	4	13
ISO 14064-1:2018	Greenhouse gases — Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals	13.020.40	ISO/TC 207/SC 7	Published (60.60)	2	9, 13
ISO 14064-2:2019	Greenhouse gases — Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements	13.020.40	ISO/TC 207/SC 7	Published (60.60)	2	9, 13
ISO 14064-3:2019	Greenhouse gases — Part 3: Specification with guidance for the verification and validation of greenhouse gas statements	13.020.40	ISO/TC 207/SC 7	Published (60.60)	2	9, 13
ISO 14066:2011	Greenhouse gases — Competence requirements for greenhouse gas validation teams and verification teams	13.020.40	ISO/TC 207/SC 7	Published (90.92)	1	
ISO 14067:2018	Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification	13.020.40	ISO/TC 207/SC 7	Published (60.60)	1	13
ISO/TR 14069:2013	Greenhouse gases — Quantification and reporting of greenhouse gas emissions for organizations — Guidance for the application of ISO 14064-1	13.020.40				
ISO 14080:2018	Greenhouse gas management and related activities — Framework and principles for methodologies on climate actions	13.020.40	ISO/TC 207/SC 7	Published (60.60)	1	12, 13
ISO 14097:2021	Greenhouse gas management and related activities — Framework including principles and requirements for assessing and reporting investments and financing activities related to climate change	03.060, 13.020.20	ISO/TC 207/SC 7	Published (60.60)	1	8, 11, 13
ISO 14385-1:2014	Stationary source emissions — Greenhouse gases — Part 1: Calibration of automated measuring systems	13.040.40	ISO/TC 146/SC 1	Published (90.93)	1	13
ISO 14385-2:2014	Stationary source emissions — Greenhouse gases — Part 2: Ongoing quality control of automated measuring systems	13.040.40	ISO/TC 146/SC 1	Published (90.60)	1	13

Standard Number	Standard Title	ICS	TC	Stage	Edition	Sustainable Development Goal(s)
ISO 19694-1:2021	Stationary source emissions — Determination of greenhouse gas emissions in energy-intensive industries — Part 1: General aspects	13.020.40, 13.040.40	ISO/TC 207/SC 7	Published (60.60)	1	3, 13
ISO 20468-2:2019	Guidelines for performance evaluation of treatment technologies for water reuse systems — Part 2: Methodology to evaluate performance of treatment systems on the basis of greenhouse gas emissions	13.020.40, 13.060.01	ISO/TC 282/SC 3	Published (60.60)	1	3, 6, 13
ISO/TS 20131-2:2018	Soil quality — Easy laboratory assessments of soil denitrification, a process source of N2O emissions — Part 2: Assessment of the capacity of soils to reduce N2O	13.080.30	ISO/TC 190/SC 4	Published (90.93)	1	
ISO 20951:2019	Soil Quality — Guidance on methods for measuring greenhouse gases (CO2, N2O, CH4) and ammonia (NH3) fluxes between soils and the atmosphere	13.020.40, 13.080.01	ISO/TC 190	Published (60.60)	1	3, 13, 15
ISO 23400:2021	Guidelines for the determination of organic carbon and nitrogen stocks and their variations in mineral soils at field scale	13.080.01	ISO/TC 190	Published (60.60)	1	
ISO/IEC 30134-8:2022	Information technology — Data centres key performance indicators — Part 8: Carbon usage effectiveness (CUE)	35.020	ISO/IEC JTC 1/SC 39	Published (60.60)	1	11, 13
ISO/WD 14068	Greenhouse gas management and related activities — Carbon neutrality	ISO/TC 207/SC 7		Under development (20.60)	1	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16
ISO/DTR 14069	Greenhouse gases — Quantification and reporting of greenhouse gas emissions for organizations — Guidance for the application of ISO 14064-1	13.020.40	ISO/TC 207/SC 7	Under development (30.60)	2	
ISO/DIS 14083	Greenhouse gases — Quantification and reporting of greenhouse gas emissions arising from transport chain operations	13.020.40	ISO/TC 207/SC 7	Under development (40.20)	1	13, 9, 11
ISO/AWI TS 19694-2	Stationary source emissions — Greenhouse Gas (GHG) emissions in energy-intensive industries — Part 2: Iron and steel industry		ISO/TC 146/SC 1	Under development (10.99)	1	
ISO/FDIS 19694-3	Stationary source emissions — Determination of greenhouse gas emissions in energy-intensive industries — Part 3: Cement industry	13.020.40, 13.040.40	ISO/TC 146/SC 1	Under development (50.00)	1	

Standard Number	Standard Title	ICS	TC	Stage	Edition	Sustainable Development Goal(s)
ISO/FDIS 19694-4	Stationary source emissions — Determination of greenhouse gas emissions in energy-intensive industries — Part 4: Aluminium industry	13.020.40, 13.040.40	ISO/TC 146/SC 1	Under development (50.00)	1	
ISO/FDIS 19694-5	Stationary source emissions — Determination of greenhouse gas emissions in energy-intensive industries — Part 5: Lime industry	13.020.40, 13.040.40	ISO/TC 146/SC 1	Under development (50.00)	1	
ISO/FDIS 19694-6	Stationary source emissions — Determination of greenhouse gas emissions in energy-intensive industries — Part 6: Ferroalloy industry	13.020.40, 13.040.40	ISO/TC 146/SC 1	Under development (50.00)	1	
ISO/CD 19694-7	Stationary source emissions — Determination of greenhouse gas emissions in energy-intensive industries — Part 7: Semiconductor and display industries	13.020.40, 13.040.40	ISO/TC 146/SC 1	Under development (30.60)	1	13

Recommendations for Design of the National MRV System

According to the approaches promoted by UNFCCC, a comprehensive national MRV system can play an important role in promotion of the national decarbonization strategy for a country.

Key elements subject to MRV under the current international framework are presented in the figure below.

Figure 4. Key elements subject to MRV under the current international framework

- **What is measured:**
  - GHG emissions and removals by sinks;
  - Emission reductions (or enhancement of removals by sinks) associated with mitigation actions compared to a baseline scenario;
  - Progress in achieving climate change mitigation and adaptation (i.e. GHG emission reductions or enhancement of sinks and reduction in vulnerability), achievement of sustainable development goals and co-benefits;
  - Support received (finance, technology and capacity-building);
  - Progress with implementation of the mitigation actions.

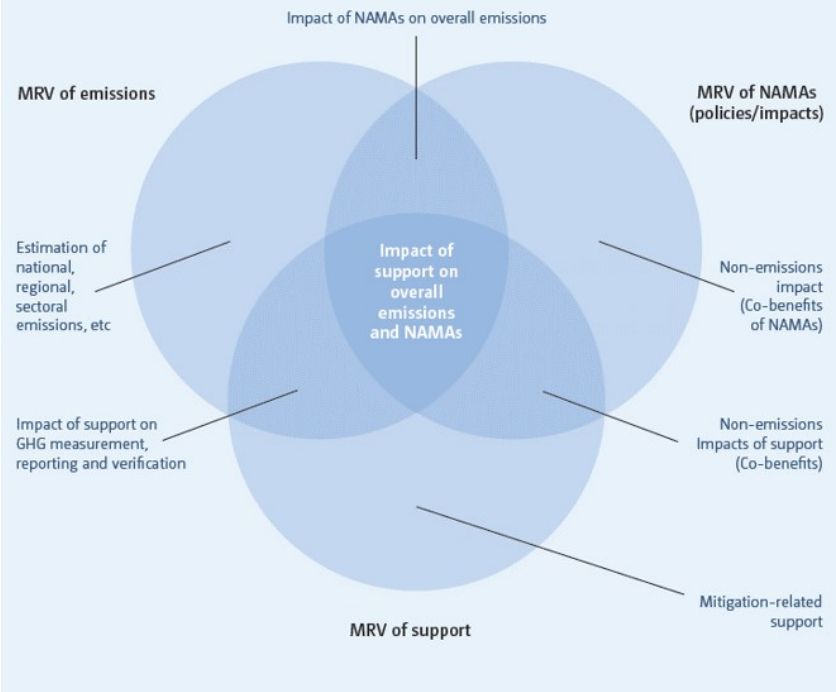
- **What is reported:**
  - Data on GHG emissions and removals by sinks (inventory as part of the national communication and inventory update report as part of the BUR);
  - Data on emission reductions (or enhancements of removals by sinks) associated with mitigation actions compared to a baseline scenario (BURs, national communications);
  - Progress with implementation of the mitigation actions (BURs, national communications);
  - Key assumptions and methodologies;
  - Sustainability objectives, coverage, institutional arrangements and activities (in the national communications and BURs);
  - Information on constraints and gaps as well as support needed and received.

- **What is verified:**
  - All quantitative and qualitative information reported, in the BUR, on national GHG emissions and removals, mitigation actions and their effects, and support needed and received;
  - Data may be verified through national MRV and through ICA, where appropriate.

There are 3 key categories om MRV:

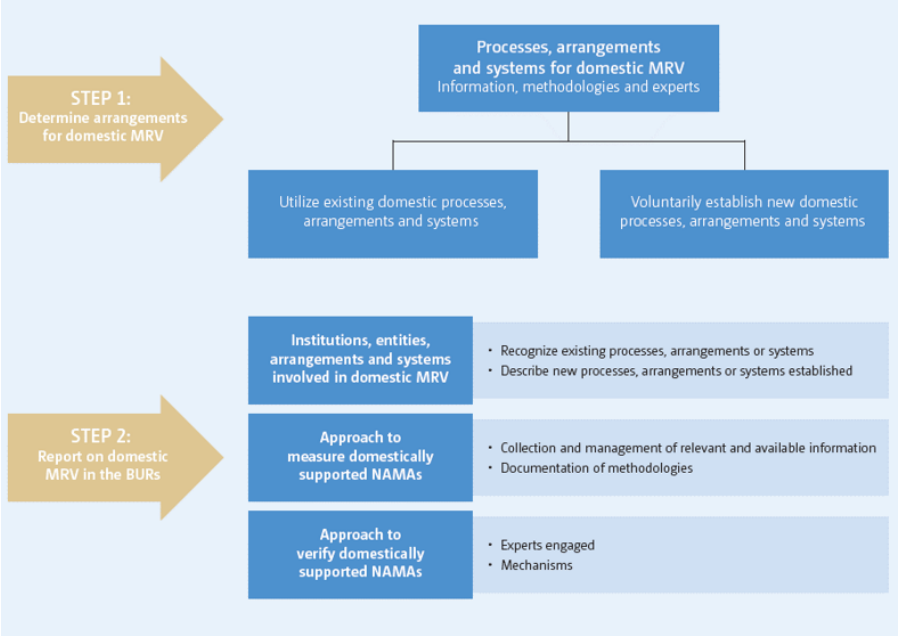
- MRV of emissions
- MRV of policies;
- MRV of support.

Figure 5. Elements of National MRV Frameworks



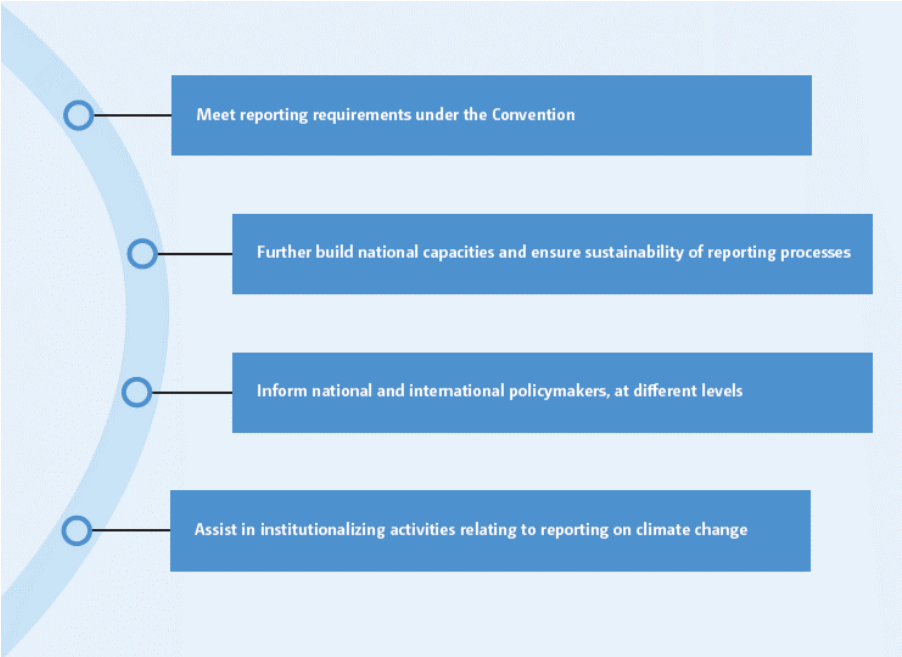
The domestic MRV framework for domestically supported NAMAs should be guided by the guidelines adopted by COP 19.49 Application of these guidelines for developing country Parties is voluntary. The guidelines are based on the principles of a voluntary, pragmatic, non-prescriptive, non-intrusive and country-driven approach. They take into account the national circumstances and national priorities, respect the diversity of NAMAs, build on existing domestic systems and capacities, recognize existing domestic MRV frameworks and promote a cost-effective approach. Their purpose is to provide general guidance on how developing country Parties may describe the domestic MRV of domestically supported NAMAs. These guidelines could help countries to set up their national MRV frameworks for policies and measures based on existing domestic processes, arrangements, methodologies and expertise, as well as to determine the information best suited for reporting on domestic MRV in the BURs.

Figure 6. Key Elements of the Guidelines for Domestic MRV of Domestically Supported NAMAs



The purpose of the domestic institutional arrangements for MRV is presented in the figure below.

Figure 7. The purpose of the domestic institutional arrangements for MRV



Based on the experience to date, sustainable institutional arrangements for MRV which can be recommended for the Republic of Moldova include the following key elements:

- Establishing national legal/formal arrangements;
- Choosing and maintaining an appropriate coordination body;
- In-country institutional and technical capacity building;
- Mechanism for stakeholder involvement.

Such institutional arrangements should ensure representation and effective involvement of all key sectors and stakeholders.

As the second step, when reporting on their domestic MRV in the BURs, developing country Parties are encouraged to provide information on three key elements, including a description of the:

- Overall institutional arrangements, whether based on existing or new processes and systems;
- Approach used to measure domestically supported NAMAs. This should include information on the systems;
- for collection and management of relevant data and on how methodologies are being documented;
- Approach used for domestic verification of the information, including a description of the experts that are engaged in the verification and the mechanisms for verification.

Both internationally and domestically supported NAMAs may be subjected to the domestic MRV and can be reported as a part of the mitigation actions within the BURs.

Figure 8. Key Elements of the Domestic Institutional Arrangements for MRV

5. RECOMMENDATIONS FOR IMPROVEMENT OF DATA INTERPRETATION AND METHODS OF DATA COLLECTION IN REPUBLIC OF MOLDOVA ALIGNED WITH EU REGULATIONS AND BEST PRACTICES AND A COMPARATIVE ANALYSIS ON DATA INTERPRETATION AND REPORTING IN OTHER EASTERN PARTNERSHIP COUNTRIES

5.1. A Comparative Analysis of Data Interpretation and Reporting in Other Eastern Partnership Countries and the Republic of Moldova

The analysis of data sources used by Eastern Partnership countries to calculate GHG emissions shows that domestic sources of primarily country-level information is a key category of relevant data.

International datasets and databases shared by the main climate information portals are not used to enhance the quality of reporting.

This gap is also relevant to the Republic of Moldova and it can be eliminated by more active use of coutry-level indicators from IEA, JRC and other UNFCCC data sources.

Table 15. A Comparative Analysis of Data Sources used in Eastern Partnership Countries for Calculation and Reporting of GHG Emissions in the Energy Sector

Data Source	Armenia	Azerbaijan	Belarus	Georgia	Moldova	Ukraine
National statistics (activity data)	Y	Y	Y	Y	Y	Y
National energy balances	Y	Y	Y	Y	Y	Y
Installation-level data (power plants, boilers etc.)	N	N	N	N	N	N
International Energy Agency databanks	N	N	N	N	N	N
UNFCCC databanks	N	N	N	N	N	N
JRC databanks	N	N	N	N	N	N

Y - Data source is used

N - Data source is not used

Energy Sector Governance

Data reporting procedures for the energy sector of the Republic of Moldova are defined by its organizational structure.

Key arrangements of the country's energy sector governance are presented below.

- ***The Government of Moldova*** responsibilities are split across various ministries and agencies, but it has a collective role in establishing the main priorities and objectives of the state policy in the energy sector. The government's mandate also includes approval of regulations that establish the energy sector foundations, including the security of supply principles and well as mechanisms, support schemes and incentives that drive energy efficiency improvements and deployment of renewable energy sources.
- ***The Ministry of Infrastructure and Regional Development (MIRD)*** is the central public authority responsible for the energy sector. The responsibilities of MIDR include elaboration and promotion of state policies, strategies, concepts and programmes, as well as legal documents in the energy sector; monitoring the implementation of state development and investment programmes; development of international energy relations, including acquisition of strategic energy resources, attracting

investments, development of energy interconnections, and development of the energy market; management of state energy property; and supporting competition in the energy sector.

- ***The National Bureau of Statistics of Moldova (NBS)*** is the entity mandated to collect, process and distribute official energy statistics in Moldova, and three statisticians are dedicated part-time to this task. The main source of data is the energy survey (form 1-BE), and complementary data are drawn from various administrative sources, for example from ANRE on wind energy and solar photovoltaic (PV) electricity generation.
- ***The National Energy Regulatory Agency (ANRE),*** established in 1997, is the state regulator for the energy sector in Moldova. Its main responsibilities include licensing, price/tariff setting, regulation and monitoring of the electricity, heating, gas and oil products markets, as well as consumer protection. ANRE promotes and ensures fair competition and efficient operation of energy markets, and contributes to energy security by approving and monitoring investment plans of system operators and by setting standards and requirements for distribution and transmission services and supply activities
- ***The Energy Efficiency Agency (EEA)*** is the administrative authority with the mandate to support the implementation of policies in the areas of energy efficiency (EE) and renewable energy sources (RES), and to attract and allocate resources for financing specific EE and RES projects. It is a separate legal entity subordinated to the Ministry of Infrastructure and Regional Development. The EEA has existed since 2010 but was restructured by government decision in 2019 when it was absorbed by the former Energy Efficiency Fund. The restructured EEA has a division responsible for implementation and monitoring of EE and RES policies and another division responsible for financing, implementation and monitoring of EE and RES projects – the mission that was formerly performed by the Energy Efficiency Fund. In addition, the Agency disseminates information on EE and RES, and contributes to the elaboration of local energy efficiency programmes, and plans and monitors their achievements
- The Ministry of Environment (ME) is responsible for developing environmental and natural resource management policies and strategies, as well as for implementing international environment treaties. It cooperates with MIRD and other institutions for the preparation of the National Energy and Climate Plan (NECP).
- ***The Moldovan Investment Agency*** is a cooperation partner for domestic and foreign investors in development projects, including energy sector projects. The Ministry of Finance is the central public administration body to develop and promote the state's public finance policy and to supervise public finances. The Ministry of Finance ensures the implementation of Public Finance Management policies and signs sovereign loans and guarantees for energy sector projects on behalf of Moldova's government.
- ***The Competition Council*** – which succeeded the National Agency for Protection of Competition (2007-2012) – is an autonomous authority, subordinated to the Parliament. The Council ensures the enforcement and observance of legislation in the domains of competition, state aid and advertising, including in the energy sector. Its mandate is to ensure compliance with competition legislation by preventing anticompetitive practices, removing of competition infringements, and by promoting and improving the competition culture.

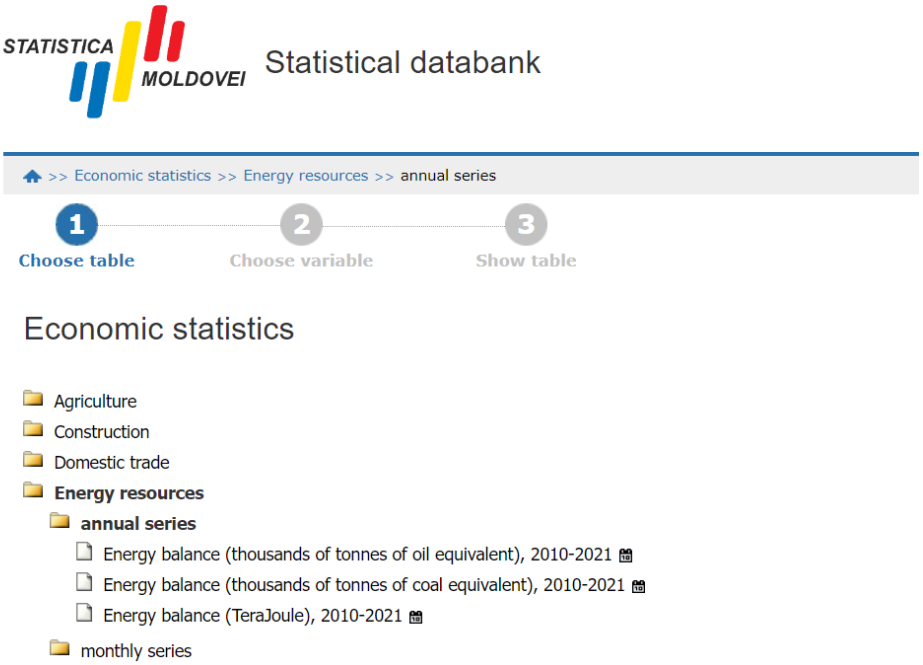
Energy Balances

The annually published energy balance is a key source of primary data necessary for calculation of GHG emissions in the Energy Sector of the Republic of Moldova.

The current structure of the energy balance is adjusted to international best practices and contain the most country-level data necessary to make calculations of GHG Emissions.

Possible improvements in development of energy balance are related to Left Bank of Dniester territories.

Figure 9. Energy Balances Published by the National Bureau of Statistics of the Republic of Moldova



Company-level Data Disclosure

Considerable improvements of GHG accounting can be achieved in the Republic of Moldova if proper data company-level and installation-level data collection and dissemination procedures are established.

The key sectoral companies in the country demonstrate quite good transparency of operational data disclosure that results in the opportunity to collect disaggregated data for key power plants, installations and other potential subjects of MRV.

Figure 10. Company-level Data Disclosure: A Case of Termoelectrica SA

Indicatorii tehnico - economici privind activitatea Centralelor Electrice cu Termoficare (CET) a "Termoelectrica" S.A., anul 2022.

№	Indicatorul	Unitate de măsură	Trimestrul I		Trimestrul II		Semestrul I		Trimestrul III		Pentru 9 luni		Trimestrul IV		Anual	
			Sursa 1	Sursa 2	Sursa 1	Sursa 2	Sursa 1	Sursa 2	Sursa 1	Sursa 2	Sursa 1	Sursa 2	Sursa 1	Sursa 2	Sursa 1	Sursa 2
1.	Puterea instalată a turbogeneratoarelor electrice	MW	258	66	258	66	258	66	258	66	258	66	258	66	258	66
2.	Puterea disponibilă a turbogeneratoarelor electrice	MW	209	53												
3.	Puterea termică instalată	Gcal/h	1200	239	1200	239	1200	239	1200	239	1200	239	1200	239	1200	239
4.	Puterea termică disponibilă	Gcal/h	704	167												
5.	Sarcina electrică maximă	MW	227	4,9												
6.	Sarcina termică maximă	Gcal/h	353	20,2												
7.	Cantitatea de energie electrică produsă	mil. kWh	358,843	2,799			358,843	2,799			358,843	2,799			358,843	2,799
8.	Cantitatea de energie electrică livrată	mil. kWh	314,358	1,990			314,358	1,990			314,358	1,990			314,358	1,990
9.	Cantitatea de energie termică livrată la colectoare	Gcal	584726	12446			584726	12446			584726	12446			584726	12446
10.	Randamentul centralei electrice la producerea energiei	%	82,58	79,03												
11.	Combustibil utilizat la producerea energiei (convenţional)	mii tcc	154,540	2,685			154,540	2,685			154,540	2,685			154,540	2,685
12.	Cantitatea de dioxid de carbon eliminată în atmosferă	mii tone	250,4	4,3	0,0	0,0	250,4	4,3	0,0	0,0	250,4	4,3	0,0	0,0	250,4	4,3
13.	Achitările pentru energia electrică livrată	%	66%													

The sectoral regulators also develop and maintain relevant datasets of key market players which can be used to improve the quality of company-level data collection and data review process. For example, the yearly plans of the planned technical controls of the electrical installations of the economic agents may be revised regularly to identify new energy consumers and generators.

Figure 11. Company-level Data Disclosure: Yearly Plans of the Planned Technical Controls of the Electrical Installations of the Economic Agents

Anexă la Hotărârea Consiliului de Administrare ANRE
nr. 547 din 27 decembrie 2019

Agenția Națională pentru Reglementare în Energetică

Planul controalelor tehnice planificate ale Instalațiilor electrice ale agenților economici pentru anul 2

Nr/o	Raion	Luna	Consumator mare (C), consumator mic (Cm),	Trimestrul/ anul	Denumirile (numele) persoanelor supuse controlului	Codul fiscal	Obiectul supus controlului și adiesa amplasării acestuia	Date de contact ale persoanelor supuse controlului
	1	2	3	4	5	6	7	8
1	CT	01	C	I/2020	ÎI Frații Adascaliței (Adascaliței Petru)	1003603001532	Moara de făină din grîu și brutăria s.Cania r-nul Cantemir	022431111
2	C	01	C	I/2020	SRL "Alex Neosim" (Ghenadii Botezat)	1002600030345	Secție de produceie. or.Chișinău, str.Armeneasca, 53	022221031
3	C	01	C	I/2020	SRL "Drancor" (Drangoi Ion)	1003600079246	Fabrică de îngețată. or.Chișinău, str.Burebista, nr.78	022520107
4	BL	01	C	I/2020	SRL „ Beermaster Brewery" m.Bălți, str.M.Sadoveanu, 35	1017602009459	Fabrica de bere m.Bălți, str.M.Sadoveanu,35	023123331
5	BL	01	C	I/2020	ÎCS „Fashion-Group" m.Bălți, str.Ștefan cel Mare, 128A (Turcan G.)	1002600035258	Fabrica de confecții m.Bălți, str.Ștefan cel Mare, 128A	023126249
6	BR	01	C	I/2020	SA"PAT-9 din Briceni or.Briceni str.Olimpică 7 (Pop Nuțu)	1003604001469	Parcul de automobile, postul de transformaie, atelierul de ieparație or.Briceni str.Olimpică 7	069372864
7	DN	01	C	I/2020	SRL "Recom-Grup" s.Elizavetovca r-nul Donduşeni (Sergiu Coroian)	1009604001195	SRL "Recom-Grup" s.Elizavetovca r-nul Donduşeni	067566777
8	ED	01	C	I/2020	SRL "Eco-Garant" or. Edineț, str. Moroșanu Nicolae, 6	1010604000624	RE amplasate în zona Parcului Industrial Edineț , or. Edineț, str. Nicolai Moroșan 6	068128114
9	FR	01	C	I/2020	SRL„Maradim cons" s. Putinești r-nul Floresti (Rotaru M)	1010607001057	Intreprindere materiale constucții s. Putinești r-nul Floresti	068338108
10	SG	01	C	I/2020	SRL"Gelibert", or. Singerei, str. Bălțului 2 (Bejenari Vasile)	1002600007503	Secția de îmbutelREre, or. Singerei, str. Bălțului 2	069555418
11	SR	01	C	I/2020	IM"Fabrica de brinzeturi din Soroca" SA, or. Soroca, str. Ștefan cel Mare, 133	1002600002966	Sectii de producere, or. Soroca, str. Ştefan cel Mare, 133	023022287
12	C	01	C	I/2020	SA "Mezon", blv. Moscovei 21, or. Chișinău	1003600088527	SA "Mezon", blv. Moscovei 21, or. Chișinău	022444111
13	C	01	C	I/2020	SA "Nistru Lada" str. Calea Orheiului 112 , or. Chișinău	1003600050528	SA "Nistru Lada" str. Calea Orheiului 112 , or. Chișinău	022460009
14	C	01	C	I/2020	SA „BTA-31" str. Petricani, 94 (Cotelea Ion)	1003600020226	Parc industrial, str. Petricani, 94, or. Chișinău	022294824
15	C	01	C	I/2020	SA „Combinatul Auto nr.5" str. Pietrăriei, 19 (Bulat Nicolae)	1003600034993	Parc industrial, str. Pietrăriei, 19, or. Chișinău	022596088
16	C	01	C	I/2020	SA "Moldova Tur" (Agarcova Siuzanna)	1003600004406	mun. Chișinau bd. Ştefan cel Mare, 4	
17	C	01	C	I/2020	SRL "Europlas-Lux", (Şarcanean-Cernat Mariana)	1017600018297	Fabricarea produselor din masa plastică, mun. Chișinău, Singera, str. Industrială, 3/1	
18	CR	01	C	I/2020	Spitalul Raional Criuleni (Halipli Sergiu)	1003600153223	RE amplasate la spitalul Raional Criuleni, or. Criuleni, str. Stefan cel Mare 1	024822136
19	DB	01	C	I/2020	S.R.L "Ecospirit (Ababii Vitalii)	1007600050858	Frigider fructelor si legumelor primăria,Pirita r-nul Dubăsari	024846286

A list of licensors in the energy sector (66 companies) can also be revised on annual basis to identify new energy generators.

Figure 12. Company-level Data Disclosure: Licensors in the Electricity Sector

Nr. d/o	Denumirea titularului licenței	Adresa poștală	Codul fiscal	Seria, numărul, data eliberării licenței	Termenul de valabilitate a
		Producerea energiei electrice			
1	"TERMOELECTRICA" SA	MD-2024, mun. Chișinău, str. T. Vladimirescu, 6	1003600026295	AC 000653 din 10.06.2008	04.06.2023
2	"CET-Nord" SA	MD-3100, m. Bălți, str. Ştefan cel Mare 168	1002602003945	AA 064573 din 10.06.2008	31.03.2024
3	"Picador-Grup" SRL	MD-2001, mun.Chișinău, str.Tighina 12	1003600040538	AA 064570 din 18.06.2008	10.02.2025
4	"Nodul Hidroenergetic Costești" ÎS	MD-5617, r-l Rișcani, or. Costești	1003602150086	AA 064588 din 10.06.2008	20.12.2025
5	"Молдавская ГРЭС" SA de tip închis	MD-3352, str. Limannaia, 1, or. Dnestrovsk, TDS Nistrului	1004615000423	AC 001646 din 15.07.2022	14.01.2023
		Transportul energiei electrice			
1	"Moldelectrica" ÎS	MD-2012, mun. Chișinău, str. V. Alecsandri, 78	1002600004580	AA 064574 din 10.06.2008	20.04.2026
		Conducerea centralizată a sistemului electroenergetic			
1	"Moldelectrica" ÎS	MD-2012, mun. Chișinău, str. V. Alecsandri, 78	1002600004580	AC 001549 din 30.06.2021	29.06.2046
		Distribuția energiei electrice			
1	"RED Nord" SA	MD-3100, mun. Bălți, str. Ştefan cel Mare, 180 a	1003602006563	AA 064561 din 03.04.2008	04.06.2023
2	ÎCS "PREMIER ENERGY DISTRIBUTION" SA	MD-2024, mun.Chișinău, str Andrei Doga, 4	1003600015231	AC 001428 din 14.01.2008	21.07.2025
		Furnizarea energiei electrice			
1	ÎCS "PREMIER ENERGY" SRL	MD-2024, mun.Chișinău, str. Andrei Doga, 4	1014600043319	AC 001427 din 16.01.2018	16.01.2028
2	SA "Furnizarea Energiei Electrice Nord"	MD-3100, mun. Bălți, str. Strîi, 17/A	1015602003305	AC 001438 din 31.01.2020	30.01.2030
3	Energocom SA	MD-2012, mun. Chișinău, str. V. Alecsandri, 78	1004600074938	AC 001293 din 16.01.2018	16.01.2028
4	Primenergo SRL	MD-2001, mun. Chișinău, str. Şt.cel Mare, 65 of.317	1004600008799	AA 064683 din 17.06.2010	16.06.2035
5	Concord Maxima SRL	MD-2023, mun. Chișinău, str. Uzinelor, 171 "A"	1002600013986	AA 064657 din 26.11.2009	26.11.2034
6	Iuganord Grup SRL	MD-3100, mun. Bălți, str. Decebal, 130	1003602021548	AA 064670 din 21.01.2010	21.01.2035
7	Imbold-Prim SRL	MD-2044, mun. Chișinău, str. Zadnipru P. 18, ap.82	1003600053976	AA 064679 din 27.04.2010	27.04.2035
8	Hideco SA	MD-2002, mun. Chișinău, str. Pădurii, 8	1002600023987	AA 064760 din 05.08.2010	05.08.2035
9	Interenergo SA	MD-2008, mun. Chișinău, str.Alexandrescu G.,5	1003600000464	AA 064698 din 07.10.2010	07.10.2035
10	Proenergy Electric SRL	MD-2062, mun. Chișinău, str. Sarmizegetusa, 90/2	1014600031602	AA 087171 din 20.10.2014	20.10.2039
11	Volt Grup SRL	MD-2005, mun. Chișinău, str. Mit. Bănulescu-Bodoni, 57 ap. 23	1003600134619	AC 000509 din 07.04.2015	07.04.2040
12	Eco Profelectric SRL	MD-3100, mun. Bălți, str. Chișinăului, 62, ap.(of.) 522	1015602004999	AC 001430 din 27.12.2019	26.12.2029
13	Garma – Grup SRL	MD-3427, r-nul Hîncești, sat. Firlădeni	1003605004560	AC 001408 din 21.02.2017	21.02.2027
14	Energia SRL	MD-3100, mun. Bălți, str. Testemițeanu, 6 ap. 49	1003602021250	AC 001205 din 19.06.2017	19.06.2027
15	Energo-Expert SRL	MD-2045, mun. Chișinău, str. N. Dimo, 31/1, ap. 71	1015611001039	AC 001272 din 25.10.2017	25.10.2027
16	Sadoveanu SRL	MD-4437, r-nul Călărași, sat. Sadova	1003609013160	AC 001321 din 29.05.2018	29.05.2028
17	Elenasig SRL	MD-4601, or. Edineț, str. M. Eminescu, 6, ap. 5	1010604001780	AC 001322 din 12.06.2018	12.06.2028
18	Furnizare Energie SRL	MD-2024, mun. Chișinău, str. Aerodromului, 23/2	1018600033040	AC 001499 din 26.07.2018	26.07.2028

A list of participants of electricity balancing market and generators allows to identify annual changes in industry participants, analyze structural changes of the electricity market or to support development of regional/municipal GHG inventories.

Figure 13. Company-level Data Disclosure: Participants of the Electricity Market

Lista codurilor "tip W" – pentru generatoare (UP, UG)							
EIC-code Codul EIC	Full Name Denumirea completă	Display Name Denumirea scurtă	EIC Parent	EIC Responsible Responsabil EIC	Registration number IDNO	VAT TVA	Function Tip / Funcția
64W-ALMGR--G1S2L	UG - Almedi Grup	ALMGR-1S					UG - Fotovoltaic
64W-ALUMSM-G1S4A	UP - Alum Sistem SRL	ALUMSM-1S					UP - Fotovoltaic
64W-ALUMSM-G2S46	UG - Alum Sistem SRL	ALUMSM-2S					Fotovoltaic
64W-ALWIND-G1S4I	UP - ALWIND-RA SRL	ALWIND-1S					Fotovoltaic
64W-ASABS--G1S4N	UG - ASA Business SRL	ASABS-1S					Fotovoltaic
64W-ATCRV-G1-W4F	UP - Autocaravana SRL	AUTCRV-1W					Eolian
64W-AUTVT-G1-W4F	UP - Autovertrans SRL	AUTOVT-1W					Eolian
64W-BRATAR-G1W4I	UP - Brătara SRL	BRATAR-1W					Eolian
64W-BXCONS-G1S4Q	UG - Bicomplex-Construct SRL	BXCONS-1S					Fotovoltaic
64W-COLIZV-G1S4Y	UG - Colizei Vechi SRL	COLIZ-1S					Fotovoltaic
64W-CTNRG-G1-W41	UP - Cota-Energy SRL	CTNRG-1W					Eolian
64W-CVLUX--G1S1L	UP - Covoare Lux SRL	CVLUX-1S					Fotovoltaic
64W-DEONER-G1W4J	UP - Deoner-Exim SRL	DEONER-1W					Eolian
64W-DXMVM-G1-W1P	UP - Danlex-MVM SRL	DXMVM-1W					Eolian
64W-DXMVM-G2-W1K	UP - Danlex-MVM SRL	DXMVM-2W					Eolian
64W-ECOAV-G1-S1K	UG - Eco-Energy AV SRL	ECOAV-1S					Fotovoltaic
64W-ECOEN--G1W1I	UP - Ecoenerg SRL	ECOEN-1W					Eolian
64W-EDLT--G1-S47	UP - Edilitate Criuleni ÎM	EDLT-1S					Fotovoltaic
64W-EDTR-SG1-W1W	UP - Edtrans-Grup SRL	EDTR-1W					Eolian
64W-EDTR-EG2-W1E	UP - Edtrans-Grup SRL	EDTR-2W					Eolian
64W-EDTR-RG3-W1T	UP - Edtrans-Grup SRL	EDTR-3W					Eolian
64W-ELASG-G1-W41	UP - Elenasig SRL	ELASG-1W					Eolian
64W-ELEXP--G1S4N	UP - Elevatexpo SRL	ELEXP-1S					Fotovoltaic
64W-ELTPR--G3W4K	UP - Elteprod SRL	ELTPRD-3W					Eolian
64W-ENRSUN-G1S44	UP - ENERGO SUN SRL	ENRSUN-1S					Fotovoltaic
64W-FEST--G1-S4P	UG - Servicii Comunale Festelita-Marianca de Jos IM	FEST-1S					Fotovoltaic
64W-FLYRN-G1-S4A	UP - Fly Ren First Solar Park SRL	FLYRN-1S					Fotovoltaic

A list of licensors in the heating sector (10 companies) may be revised on annual basis to identify new heat supply companies or structural changes of the heating market.

Figure 14. Company-level Data Disclosure: Licensors in the Heating Sector

nr d/o	Denumirea titularului licenței	Adresa poștală	Codul fiscal	Seria, numărul, data eliberării licenței	Termenul de valabilitate a licenței
1	SA „TERMOELECTRICA"	MD-2024, mun. Chișinău, str. Tudor Vladimirescu, 6	1003600026295	AC nr. 000654 din 02.10.2015	02.10.2040
2	ÎM „TERMOGAZ BĂLȚI"	MD-3100, mun. Bălți, str. Feroviarilor, 19/A	1003602009014	AC nr. 000536 din 02.10.2015	02.10.2040
3	SA „COMGAZ-PLUS"	MD-3601, or. Ungheni, str. Boico, 15	1002609001375	AC nr. 000540 din 13.10.2015	13.10.2040
4	SA „APĂ-CANAL CHIȘINĂU"	MD-2005, mun. Chișinău, str. Albișoara, 38	1002600015876	AC nr. 000545 din 27.10.2015	27.10.2040
5	ÎM a „REȚELELOR ȘI CENTRALELOR TERMICE COMRAT"	MD-3801 UTA Găgăuzia, mun. Comrat, str. Pobedî, 79 A	1003611003223	AC nr. 001583 din 27.10.2015	27.10.2040
6	SA „CET-NORD"	MD-3100, mun. Bălți, str. Ștefan cel Mare, 168	1002602003945	AC nr. 000552 din 01.12.2015	01.12.2040
7	ÎM „SERVICII COMUNALE GLODENI"	MD-4901, or. Glodeni, str. Lev Tolstoi, 7	1008602006801	AC nr. 000588 din 03.03.2016	03.03.2041
8	ÎM „ANTERMO"	MD-6501, or. Anenii Noi, str. A. Suvorov, 6	1003600092663	AC nr. 001472 din 18.08.2020	17.08.2045
9	ÎM „REȚELE TERMICE FLOREȘTI"	MD-5001, or. Florești, str. Libertății, 2	1007607006728	AC nr. 001492 din 25.11.2020	24.11.2045
10	ÎM „SERVICII COMUNAL-LOCATIVE" ORHEI	MD-3501, mun. Orhei, str. Renașterii Naționale, 18	1003606002183	AC nr. 001619 din 20.04.2022	19.04.2047

A list of licensors in the fuel distribution sector (112 companies) may be used to improve regional fuel consumption monitoring process and to develop regional GHG inventories.

Figure 15. Company-level Data Disclosure: Licensors in the Fuel Distribution Sector

Nr. d/o	Denumirea titularului licenței	Adresa poștală	Codul fiscal	Seria, numărul, data eliberării licenței	Termenul de valabilitate a licenței
	IMPORTUL ȘI COMERCIALIZAREA CU RIDICATA A BENZINEI ȘI MOTORINEI				
1	AVANTE SRL	MD-2019, mun. Chișinău, str. Grenoble, 120	1002600008902	AC 001244 din 26.08.2017	26.08.2022
2	ESTCON CONSTRUCT SRL	MD-7721, r-nul Ialoveni, sat. Alexandrovca	1007600009797	AC 001269 din 12.10.2017	12.10.2022
3	VERO-NADINA SRL	MD-6401, or. Nisporeni, str. Suveranității, 61	1002609000220	AC 001279 din 15.11.2017	15.11.2022
4	ÎM ROMPETROL MOLDOVA SA	MD-2001, mun. Chișinău, bd. Ștefan cel Mare și Sfânt, 73/1	1002600015382	AC 001515 din 18.12.2017	18.12.2022
5	VITLA-PETROL SRL	MD-3501, mun. Orhei, str. 31 August, 193	1002606001282	AC 001342 din 25.09.2018	25.09.2023
6	GET PREMIUM SRL	MD-2012, mun. Chișinău, str. București, 87, of. 3	1013600006272	AC 001391 din 15.07.2019	14.07.2024
7	ENERGO PETROL SRL	MD-6811, r-nul Ialoveni, s. Bardar, str. D. Aurel, 68	1009600025016	AC 001416 din 07.11.2019	06.11.2024
8	Parcul de Autobuze și Taximetre Nr.9 Briceni SRL	MD-4701, or. Briceni, str. Olimpiiscaia, 3	1003604001469	AC 001423 din 17.12.2019	16.12.2024
9	AGROSTOC COOP	MD-3701, or. Strășeni, str. A. Mateevici, 18/7	1002600024825	AC 001470 din 24.07.2020	23.07.2025
10	EURO OIL GRUP SRL	MD-4401, or. Călărași, str. N. Testemițanu, 63	1019600047884	AC 001473 din 02.09.2020	01.09.2025
11	NAFTATRANS SRL	MD-2055, mun. Chișinău, or. Vatra, str. Plopilor, 25	1013600039461	AC 001474 din 09.09.2020	08.09.2025
12	CANCUN PRIM SRL	MD-2059, mun. Chișinău, str. Petricani, 206/1	1007600075420	AC 001493 din 25.11.2020	24.11.2025
13	VITOIL-TRADING SRL	MD-5301, or. Vulcănești, str. Vl. Korolenko, 6	1016611000707	AC 001556 din 26.08.2021	25.08.2026
14	ADNA-PLUS SRL	MD-2055, mun. Chișinău, or. Vatra, str. Ștefan Vodă, 33, ap.(of.) 10	1003600069795	AC 001575 din 11.11.2021	10.11.2026
15	TRANSIMEX SRL	MD-6801, or. Ialoveni, str. Grigore Vieru, 12/A	1003601002199	AC 001581 din 26.11.2021	25.11.2026
16	ENERGO PETROL - ML SRL	MD-4101, or. Cimișlia, str. Barbu Lăutaru, 1/A	1021600011231	AC 001585 din 07.12.2021	06.12.2026
17	SINDBAD SRL	MD-6401, or. Nisporeni, str. Alexandru cel Bun, 16	1003609010837	AC 001612 din 01.04.2022	31.03.2027
18	GLORIA-QVARC SRL	MD-4601, or. Edinet, str. Șos. Bucovinei, 37/A	1002604001200	AC 001626 din 12.05.2022	11.05.2027
19	ÎCS BEMOL RETAIL SRL	MD-2005, mun. Chișinău, str. Moara Roșie, 5/1	1004601004787	AC 001627 din 13.05.2022	12.05.2027
20	ANCOM-AGRO SRL	MD-5023, r-nul Florești, sat. Gura Camencii	1013607003096	AC 001632 din 20.05.2022	19.05.2027
21	GERMAN OIL SRL	MD-2012, mun. Chișinău, str. Armenească, 28	1018600020691	AC 001635 din 03.06.2022	02.06.2027
22	ÎM TIREX-PETROL SA	MD-2012, mun. Chișinău, str. Armenească, 28	1003600008275	AC 001643 din 09.07.2022	08.07.2027
23	PETROM-MOLDOVA SRL	MD-2002, mun. Chișinău, șos. Muncești, 269	1002600045798	AC 001649 din 18.07.2022	17.07.2027
24	BEMOGA-DS SRL	MD-4111, r-nul Cimișlia, sat. Fetița	1022605000453	AC 001654 din 21.07.2022	20.07.2027
25	ÎCS LUKOIL-MOLDOVA SRL	MD-2012, mun. Chișinău, str. Columna, 92	1002600005897	AC 001239 din 16.08.2017	16.08.2022
26	"ТИРОЙЛТРЕЙД" SRL	MD-3300, str. Odesa, 66 A, mun. Tiraspol, TDS Nistrului	1016615000174	AC 001621 din 23.04.2022	22.10.2022
27	"ШЕРИФ" SRL	MD-3300, str. Șevcenco, 81/11, mun. Tiraspol, TDS Nistrului	1004615001187	AC 001659 din 28.07.2022	27.01.2023

5.2. Recommendations for Improvement of Data Interpretation and Methods of Data Collection in the Republic of Moldova

There are several dozens of key internationally-available data sources which use can improve data interpretation and data collection methods for the energy sector of the Republic of Moldova.

The data sources from the following international data providers should be used on a regular basis:

- Argonne National Laboratory;
- Basel Agency for Sustainable Energy (BASE);
- BMU, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), New Climate Institute;
- C40 Cities;
- CDP;
- Climate & Global Dynamics (CGD), National Center for Atmospheric Research (NCAR);
- Climate Analytics;
- Climate Development and Knowledge Network (CDKN);
- Climate Policy Radar;
- Climate Technology Centre & Network (CTCN);
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ);
- EcoTransIT® World Initiative (EWI);
- Enerdata;
- German Development Institute (DIE);
- Global Alliance for Buildings & Construction, United Nations Environment Programme (UNEP);
- Global Environment Facility (GEF);
- Global Methane Initiative (GMI);
- Green Cooling Initiative (GCI);
- Greenhouse Gas Protocol;
- ICLEI Local Governments for Sustainability;
- ifeu - Institut für Energie- und Umweltforschung Heidelberg;
- Intergovernmental Panel on Climate Change (IPCC);
- International Atomic Energy Agency (IAEA);
- International Council on Clean Transportation (ICCT);
- International Energy Agency (IEA);
- International Institute for Sustainability Analysis and Strategy (IINAS);
- International Renewable Energy Agency (IRENA);
- International Sustainable Systems Research Center (ISSRC);
- Kigali Cooling Efficiency Program (K-CEP);
- Massachusetts Institute of Technology (MIT);
- National Renewable Energy Laboratory (NREL);
- NewClimate Institute;
- Partnership for Economic Policy (PEP);
- Resources to Advance LEDS Implementation (RALI);

- Stockholm Environment Institute (SEI);
- Sustainable Energy Planning Research Group at Aalborg University;
- U.S. Environmental Protection Agency;
- UNEP DTU;
- United Nations Development Programme (UNDP);
- United Nations Framework Convention on Climate Change (UNFCCC);
- United States Agency for International Development (USAID);
- Verified Carbon Standard (VCS);
- Water and Wastewater Companies for Climate Mitigation (WaCCLIM);
- World Bank;
- World Resources Institute (WRI).

UNFCCC Resources

UNFCCC Resources database provides a wide range of tools, guidelines, case studies and online trainings to support development of national-, sectoral- and municipal-level decarbonization strategies and reporting documents and can be used to enhance the quality of national GHG emissions accounting procedures in the Republic of Moldova.

Figure 16. UNFCCC Resources

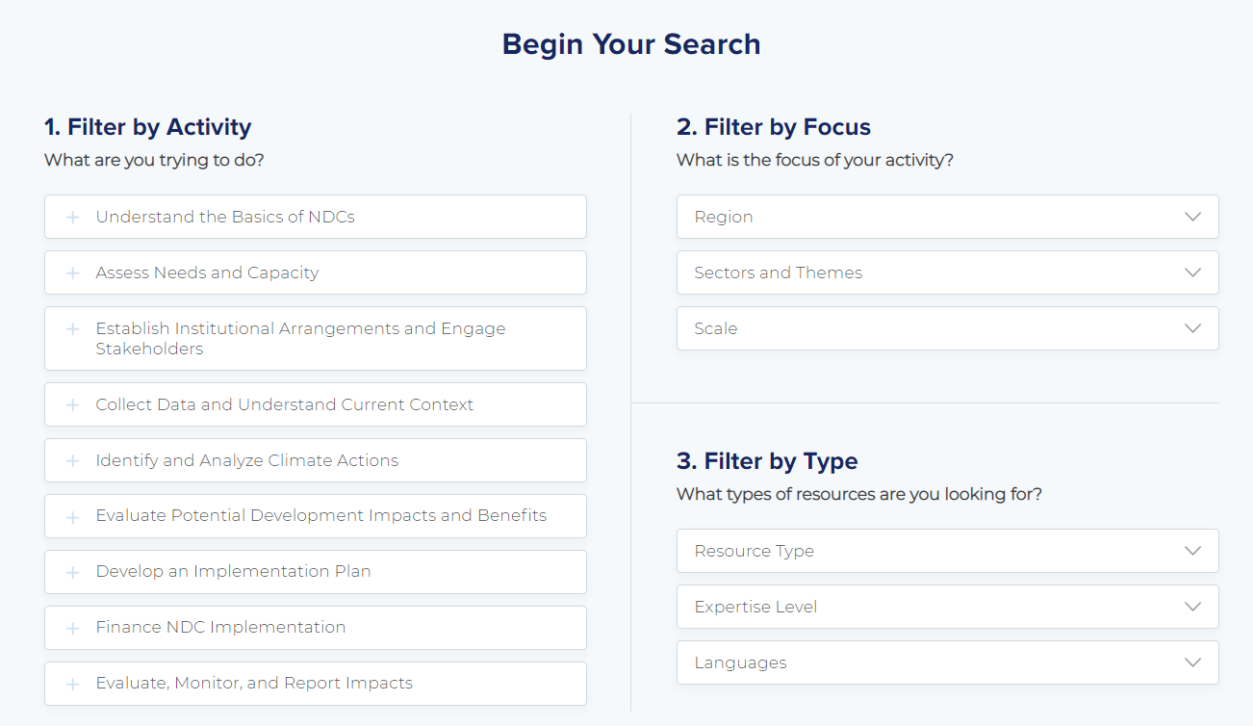
Showing 50 of 350 results — Show me 50 results

Type of resource	Title	Author	Topic	
Tool	The Climate Explorer	United States of America	Transparency framework	Access
Project	EU4Environment	European Union	Adaptation	Access
Case study	NDC preparation and implementation in EaP countries	European Union	Nationally determined contributions (NDCs)	Access
Project	ECO schools	Foundation for Environmental Education (FEE)	Global climate action (GCA)	Access
Project	Women in Agriculture Impact Investment (WAII) Facility	Finding XY	Gender and climate change	Access
Project	Uganda Green Enterprise Finance Accelerator (UGEFA) Program	Finding XY	Climate finance	Access
Tool	CLIMADA	ETH Zurich	Adaptation	Access
Project	Impulsouth	Impulsouth, Fundación Avina	Global climate action (GCA)	Access

NDC Partnership Climate Toolbox

The Climate Toolbox draws together tools, guidance, platforms, and advisory support from leading institutions in a searchable database to help countries plan and implement their NDCs. This data source can also be used to enhance the quality of national GHG emissions accounting procedures in the Republic of Moldova.

Figure 17. NDC Partnership Climate Toolbox



IEA Databases

International Energy Agency provides an access to detailed country-level energy statistics and has a broad range of different datasets that can improve the quality of data collection process for GHG emissions accounting in the energy sector of the Republic of Moldova.

Figure 18. Opportunities from IEA Statistics and Reports: Energy Balances and Key Statistics

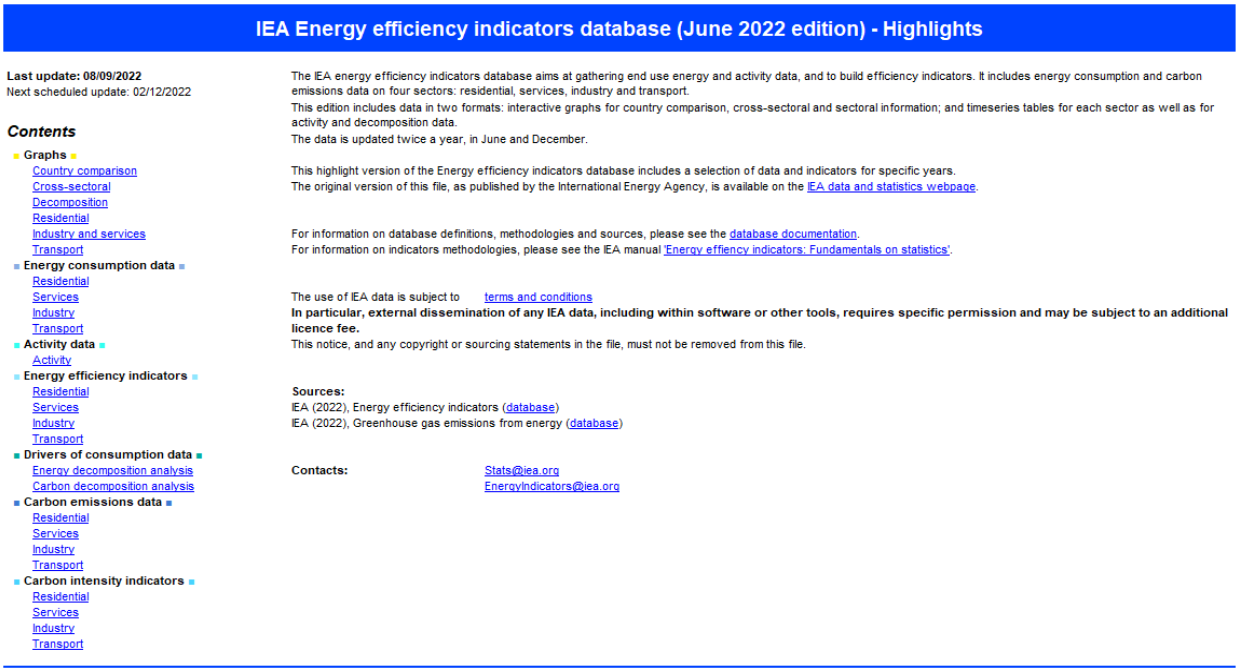
Unit: Mtoe

SUPPLY		1990	2010	2015	2017	2018	2019	2020
TOTAL PRODUCTION		0.08	0.52	0.66	0.77	0.80	0.67	0.68
Coal		-	-	-	-	-	-	-
Peat		-	-	-	-	-	-	-
Oil		-	0.01	0.01	0.01	0.01	0.00	0.01
Natural gas		-	0.00	0.00	0.00	0.00	0.00	0.00
Biofuels[1]		0.06	0.51	0.64	0.76	0.79	0.65	0.67
Nuclear		-	-	-	-	-	-	-
Hydro		0.02	0.01	0.00	0.00	0.00	0.01	0.00
Wind		-	-	0.00	0.00	0.00	0.00	0.00
Geothermal		-	-	-	-	-	-	-
Solar		-	-	0.00	0.00	0.00	0.00	0.00
TOTAL NET IMPORTS		9.82	1.94	1.93	2.04	2.16	2.12	2.08
Coal	Exports	-	-	-	-	-	-	-
	Imports	2.01	0.10	0.09	0.12	0.09	0.09	0.08
	Net imports	2.01	0.10	0.09	0.12	0.09	0.09	0.08
Oil	Exports	-	0.01	0.01	0.03	0.03	0.01	0.01
	Imports	4.87	0.74	0.85	0.96	1.04	1.03	0.97
	Int'l marine and aviation bunkers	-0.07	-0.02	-0.02	-0.05	-0.06	-0.05	-0.02
	Net imports	4.79	0.72	0.81	0.88	0.95	0.97	0.94
Natural gas	Exports	-	-	-	-	-	-	-
	Imports	3.28	0.86	0.73	0.75	0.82	0.76	0.77
	Net imports	3.28	0.86	0.73	0.75	0.82	0.76	0.77
Electricity	Exports	0.65	-	-	-	-	-	-
	Imports	0.39	0.26	0.29	0.29	0.30	0.30	0.29
	Net imports	-0.26	0.26	0.29	0.29	0.30	0.30	0.29
TOTAL STOCK CHANGES		-0.01	0.05	-0.00	-0.01	-0.01	-0.00	-0.02
TOTAL SUPPLY (TES)[2]		9.89	2.51	2.58	2.80	2.95	2.79	2.75
Coal		2.00	0.10	0.10	0.10	0.08	0.10	0.08
Peat		-	-	0.00	-	-	-	-
Oil		4.79	0.76	0.81	0.89	0.95	0.97	0.94
Natural gas		3.28	0.87	0.74	0.75	0.82	0.76	0.77
Biofuels[1]		0.06	0.51	0.65	0.76	0.79	0.65	0.66
Nuclear		-	-	-	-	-	-	-

DEMAND FINAL CONSUMPTION	1990	2010	2015	2017	2018	2019	2020
TFC	6.68	2.29	2.39	2.63	2.77	2.64	2.61
Coal	0.87	0.10	0.10	0.10	0.08	0.10	0.08
Peat	-	-	0.00	-	-	-	-
Oil	3.60	0.74	0.80	0.87	0.94	0.96	0.93
Natural gas	0.98	0.43	0.35	0.39	0.44	0.42	0.44
Biofuels[1]	0.06	0.50	0.63	0.75	0.76	0.63	0.64
Geothermal	-	-	-	-	-	-	-
Solar	-	-	-	-	-	-	-
Electricity	0.89	0.28	0.32	0.32	0.33	0.33	0.33
Heat	0.28	0.24	0.20	0.20	0.21	0.20	0.19
Shares in TFC (%)							
Coal	*13.1*	*4.5*	*4.0*	*3.8*	*2.9*	*3.9*	*3.0*
Peat	-	-	*0.0*	-	-	-	-
Oil	*53.9*	*32.1*	*33.2*	*33.3*	*34.0*	*36.5*	*35.8*
Natural gas	*14.6*	*18.8*	*14.8*	*14.7*	*15.8*	*16.0*	*16.9*
Biofuels[1]	*0.9*	*21.8*	*26.4*	*28.4*	*27.6*	*23.8*	*24.6*
Geothermal	-	-	-	-	-	-	-
Solar	-	-	-	-	-	-	-
Electricity	*13.3*	*12.3*	*13.2*	*12.1*	*11.9*	*12.4*	*12.6*
Heat	*4.1*	*10.5*	*8.4*	*7.7*	*7.7*	*7.4*	*7.3*
TOTAL INDUSTRY[4]	1.12	0.25	0.25	0.25	0.31	0.29	0.30
Coal	0.20	0.03	0.04	0.03	0.02	0.02	0.02
Peat	-	-	-	-	-	-	-
Oil	0.00	0.04	0.05	0.05	0.11	0.10	0.11
Natural gas	0.53	0.06	0.05	0.05	0.07	0.06	0.06
Biofuels[1]	-	0.00	0.00	0.00	0.00	0.00	0.00
Geothermal	-	-	-	-	-	-	-
Solar	-	-	-	-	-	-	-
Electricity	0.39	0.07	0.07	0.07	0.07	0.06	0.06
Heat	-	0.05	0.04	0.05	0.05	0.05	0.04
Shares in total industry (%)							
Coal	*18.3*	*10.9*	*15.7*	*11.4*	*7.9*	*7.8*	*6.4*
Peat	-	-	-	-	-	-	-
Oil	*0.2*	*16.6*	*19.1*	*21.1*	*33.6*	*33.0*	*36.8*
Natural gas	*47.0*	*23.5*	*21.7*	*21.8*	*21.9*	*20.2*	*21.1*
Biofuels[1]	-	*0.3*	*0.6*	*0.4*	*0.5*	*0.2*	*0.5*
Geothermal	-	-	-	-	-	-	-
Solar	-	-	-	-	-	-	-
Electricity	*34.5*	*27.4*	*26.7*	*26.5*	*21.1*	*22.0*	*20.4*
Heat	-	*21.3*	*16.2*	*18.9*	*15.0*	*16.8*	*14.8*
TRANSPORT	0.84	0.58	0.65	0.69	0.70	0.72	0.67

For example, the Energy Efficiency Indicators database contains data from 2000 to 2020, covering end-use energy consumption, and carbon emissions for the IEA member countries and beyond. The database also includes end use energy efficiency indicators and carbon intensity indicators for different countries, including the Republic of Moldova.

Figure 19. IEA's Energy Efficiency Indicators Database



IEA Energy efficiency indicators database (June 2022 edition) - Highlights

Last update: 08/09/2022
Next scheduled update: 02/12/2022

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The IEA energy efficiency indicators database aims at gathering end use energy and activity data, and to build efficiency indicators. It includes energy consumption and carbon emissions data on four sectors: residential, services, industry and transport.
This edition includes data in two formats: interactive graphs for country comparison, cross-sectoral and sectoral information; and timeseries tables for each sector as well as for activity and decomposition data.
The data is updated twice a year, in June and December.

This highlight version of the Energy efficiency indicators database includes a selection of data and indicators for specific years.
The original version of this file, as published by the International Energy Agency, is available on the IEA data and statistics webpage.

For information on database definitions, methodologies and sources, please see the database documentation.
For information on indicators methodologies, please see the IEA manual 'Energy effiency indicators: Fundamentals on statistics'.

The use of IEA data is subject to terms and conditions
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Sources:
IEA (2022), Energy efficiency indicators (database)
IEA (2022), Greenhouse gas emissions from energy (database)

Contacts: Stats@iea.org
EnergyIndicators@iea.org

Energy Community Data

As a Contracting Party to the Energy Community Treaty, Moldova has the obligation to implement the energy acquis in force. Parallel to the adoption of secondary legislation, the implementation of the acquis gives rise to diverse reporting obligations.

Particularly the implementation of the renewable energy and energy efficiency acquis is based on comprehensive, multi-annual action plans. As a first step, the Parties draft and adopt the action plans that set the steps for achieving the negotiated targets. They are subsequently obliged to report about the progress achieved in the form of regular progress reports.

Starting in 2019, Moldova also has a reporting obligation pursuant Annex VIII.B of the Large Combustion Plant Directive 2001/80/EC as amended by Decision 2013/05/MC-EnC.

Figure 20. Energy Community Data: Policies and Measures to Promote the Use of Energy from Renewable Resources

Overview of all policies and measures

	Name and reference of the measure	Type of measure*	Expected result**	Targeted group and/or activity***	Existing or planned	Start and end dates of the measure
Targets: setting and follow-up						
1.	Overall national renewable energy target	Regulatory	Increase renewable energy generation in order to meet the overall national target	Generators of renewable electricity, biofuel producers/importers/suppliers	Existing	2013-2020
2	Monitoring of the overall national renewable energy target fulfilment	Regulatory	Target achievement/corrective interventions	Relevant operators and National Bureau of Statistics	Planned	2013-2020
Laws, strategies, plans and programs						
3	Law No. 124 of 23.12.2009 on Electricity	Regulatory	Establish framework for RES promotion. Principle of priority dispatch and purchase obligation of RES-E.	RES producers, Transmission network and System Operator (TSO), Distribution network Operators (DSOs), electricity suppliers	Existing	2013-2020

Members to the Energy Community are to report data on emissions and energy input to the so-called Large Combustion Plants as defined by the Industrial Emissions Directive (2010/75/EU).

This database contains plant-by-plant data on Large Combustion Plants (LCP) for the years 2018 to 2021 reported under the Energy Community Treaty, as implemented by Council Decision 2006/500/EC of 29 May 2006.

The data include rated thermal input, annual energy input and emissions of SO_2, NO_X and dust. In addition, information on derogations under the provisions of the agreed legislation under the Treaty is provided.

Figure 21. EU Best Practices: Reporting on Large Combustion Plants

ReportingCountry	ReferenceYear	PlantName	Plant ID	Biomass (TJ)	Coal (TJ)	Lignite (TJ)	Peat (TJ)	Other S	Liquid Fuels (TJ)	Natural Gas (TJ)	Other Gases (T	SO_2	NO_X	Dust
BA	2021	TPP Gacko-1	G-1	0,0		17176,19	0,0	0,0		0,0	0,0	21862,7	4358,7	4960,4
BA	2021	TPP Kakanj-5	K-5	0,0	5220,7		0,0	0,0	6,4	0,0	0,0	13298,0	1365,0	11,0
BA	2021	TPP Kakanj-6	K-6	0,0	5526,7		0,0	0,0	7,3	0,0	0,0	14507,0	1484,0	12,0
BA	2021	TPP Kakanj-7	K-7	0,0	12042,7		0,0	0,0	6,6	0,0	0,0	31135,0	3086,0	26,0
BA	2021	ICHPP Natron Hayat LUKO-4	LUKO-4	0,0			0,0	0,0	1970,2	0,0	0,0	7,5	163,8	35,9
BA	2021	TPP Stanari	Stanari_1	0,0		19303,06	0,0	0,0		0,0	0,0	1872,3	1663,7	586,4
BA	2021	TPP Tuzla-3	T-3	0,0	1317,2	3051,9	0,0	0,0	21,9	0,0	0,0	3018,1	208,6	52,0
BA	2021	TPP Tuzla-4	T-4	0,0	3496,8	5836,0	0,0	0,0	52,9	0,0	0,0	11251,9	1288,0	312,3
BA	2021	TPP Tuzla-5	T-5	0,0	2985,2	5321,5	0,0	0,0	44,9	0,0	0,0	7661,0	921,4	115,3
BA	2021	TPP Tuzla-6	T-6	0,0	13704,9		0,0	0,0	19,0	0,0	0,0	21623,6	1014,1	90,6
BA	2021	TE Ugljevik	U-1	0,0	18318,0		0,0	0,0		0,0	0,0	86774,0	3038,0	755,0
BA	2021	ICHPP Natron Hayat UKO-3	UKO-3	0,0	0,0	0,0	0,0	0,0		0,0	0,0	0,0	0,0	0,0
BA	2021	ICHPP Natron Hayat UKO-4	UKO-4	0,0	137,8	1722,8	0,0	0,0		0,0	0,0	528,7	371,2	81,3
GE	2021	LLC Georgian International Energy Corporation	GE0001	0,0	0,0	0,0	0,0	0,0	0,0	8421429,0	0,0	0,0	33,3	0,0
GE	2021	Mtkvary Energy LLC	GE0002	0,0	0,0	0,0	0,0	0,0	0,0	2749691,0	0,0	0,0	149,6	0,0
GE	2021	GPower LLC	GE0003	0,0	0,0	0,0	0,0	0,0	0,0	3769111,0	0,0	0,0	24,3	0,0
GE	2021	LLC Gardabani TPP	GE0004	0,0	0,0	0,0	0,0	0,0	0,0	6627972,0	0,0	0,0	173,1	0,0
GE	2021	LLC Gardabani TPP 2	GE0005	0,0	0,0	0,0	0,0	0,0	0,0	7884384,0	0,0	0,0	213,7	0,0
MD	2021	TERMOELECTRICA Centrala Electrică cu Termoficare Sursa 1	LCP MD 000001	0,0	0,0	0,0	0,0	0,0	464,0	9557,9	0,0	232,4	524,7	24,5
MD	2021	TERMOELECTRICA Centrala Electrică cu Termoficare Sursa 2	LCP MD 000002	0,0	0,0	0,0	0,0	0,0		590,9	0,0	0,2	28,4	0,2
ME	2021	Thermal power plant "Pljevlja"	ME0001	0,0	0,0	13701,0	0,0	0,0	18,2	0,0	0,0	40502,0	3458,9	502,5
MK	2021	ESM AD Skopje - REK Bitola (B1 + B2)	MK0001	0,0	0,0	16183,0	0,0	0,0	696,0	0,0	0,0	60925,0	2829,0	1983,0
MK	2021	ESM AD Skopje - REK Bitola (B3)	MK0002	0,0	0,0	5683,0	0,0	0,0	275,0	0,0	0,0	18581,0	621,0	638,0
MK	2021	ESM AD Skopje - REK Oslomej	MK0003	0,0	0,0	1579,0	0,0	0,0	167,0	0,0	0,0	3378,0	339,0	355,0
MK	2021	TEC Negotino	MK0004	0,0	0,0	0,0	0,0	0,0	324,0	0,0	0,0	175,0	43,2	8,4
MK	2021	BEG - Toplana Istok	MK0005	0,0	0,0	0,0	0,0	0,0	0,0	602,0	0,0	0,0	21,9	0,6
MK	2021	BEG - Toplana Zapad	MK0006	0,0	0,0	0,0	0,0	0,0	0,0	286,0	0,0	0,0	7,6	0,3
MK	2021	Rafinerija OKTA - Procesna Instalacija	MK0007	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
MK	2021	Rafinerija OKTA - Energetika	MK0008	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
RS	2021	EPS, Termoleketrana Nikola Tesla A, A1-A3	RS0001	0,0	0,0	42205,88	0,0	0,0	1470,71	0,0	0,0	37735,0	5210,7	1805,0

Delivery process is managed by EEA.

This data can be used to improve station-level GHG accounting and monitoring.

As a result of such an obligation, Moldova can use the data for its large combustion plants to develop more detailed GHG inventories for some territories or installations.

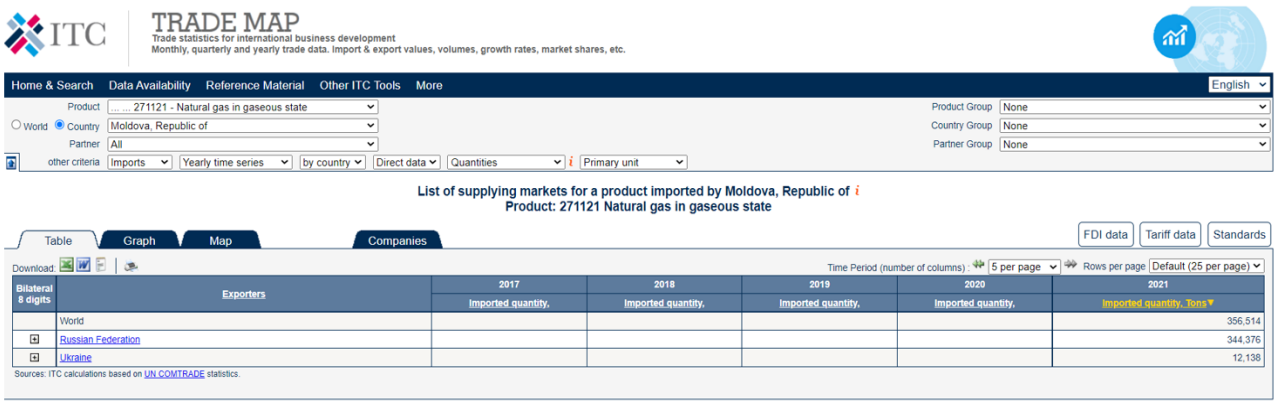
Figure 22. Installation-level Monitoring: European Environment Agency: Large Combustion Plants Data for Moldova

ReportingCountry	ReferenceYear	PlantName	Plant ID	Biomass (TJ)	Coal (TJ)	Lignite (TJ)	Peat (TJ)	Other S	Liquid Fuels (TJ)	Natural Gas (TJ)	Other Gases (T	SO_2	NO_X	Dust
MD	2021	TERMOELECTRICA Centrala Electrică cu Termoficare Sursa 1	LCP MD 000001	0,0	0,0	0,0	0,0	0,0	464,0	9557,9	0,0	232,4	524,7	24,5
MD	2021	TERMOELECTRICA Centrala Electrică cu Termoficare Sursa 2	LCP MD 000002	0,0	0,0	0,0	0,0	0,0		590,9	0,0	0,2	28,4	0,2

Trade Map Data

Trade Map database developed by ITC provides a wide range of possibilities to analyze import-export data statistics for energy products (with detalisation of data up to 10-sign HS codes) for all the countries and can be used as an additional source of information for country-level analysis.

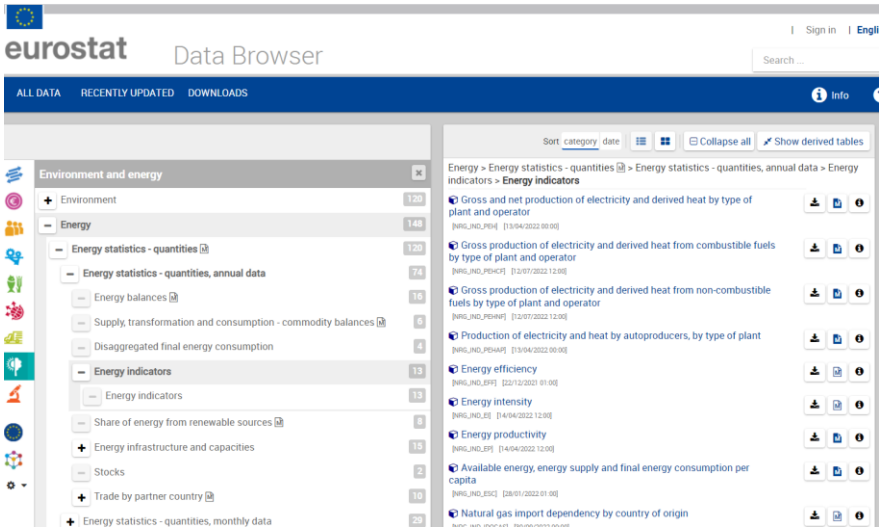
Figure 23. Fuel Import-Export Statistics from Trade Map



EU Best Practices in Data Collection and Disclosure: Eurostat Statistics

The data collection approach used in the EU member states implies a high level of detalisation of disclosure of different relevant parameters. Such an approach can be quite useful for the Republic of Moldova taking into account a need to align its statistical reporting procedures with EU requirements.

Figure 24. EU Best Practices: Eurostat Statistics



EU Best Practices in Data Collection and Disclosure: EU-ETS

The EU-ETS is a good example of comprehensive approach for data collection and GHG emissions reporting on installation level.

The approach used in EU-ETS allows to get access to all the critical data needed to assess GHG emissions of participants of this system.

The figure below demonstrates an example of the level of data disclosure for participants of EU-ETS on company level.

Figure 25. EU Best Practices: Firm-Level Data Disclosure in the EU-ETS

ATIONAL_REGI	_NATIONAL_ADMINS	EUTL_ACCOUNT_TYPE	EUTL_AH_NAME	EUTL_ADDRESS_MAIN	_ADDRESS_SECO	EUTL_CITY	EUTL_POSTCOD	_AH_COU	EUTL_AH_COUNTRY	
ES	Spain	Former Operator Holding Account	DS SMITH SPAIN S.A.	Ctra de Burgos a Portugal, km 96		DUEÑAS	34210	ES	Spain	A
ES	Spain	Former Operator Holding Account	DS SMITH SPAIN S.A.	Ctra de Burgos a Portugal, km 96		DUEÑAS	34210	ES	Spain	A
ES	Spain	Operator Holding Account	DS SMITH SPAIN S.A.	Ctra de Burgos a Portugal, km 96		DUEÑAS	34210	ES	Spain	A
ES	Spain	Operator Holding Account	DS SMITH SPAIN S.A.	Ctra de Burgos a Portugal, km 96		DUEÑAS	34210	ES	Spain	A
ES	Spain	Former Operator Holding Account	Nuevos Productos Cerámicos S.A.	Poligono Industrial "La Emperadora", s/n		Vilafamés (Castellón)	12192	ES	Spain	A
ES	Spain	Operator Holding Account	Nuevos Productos Cerámicos S.A.	Poligono Industrial "La Emperadora", s/n		Vilafamés (Castellón)	12192	ES	Spain	A
BE	Belgium	Former Operator Holding Account	Aurubis Belgium	Watertorenstraat 35		Olen	2250	BE	Belgium	0
BE	Belgium	Operator Holding Account	Aurubis Belgium	Watertorenstraat 35		Olen	2250	BE	Belgium	0
BE	Belgium	Former Operator Holding Account	Cimenteries CBR Cementbedrijven	Boulevard de France 3-5		Braine-l'Alleud	1420	BE	Belgium	0
BE	Belgium	Former Operator Holding Account	Cimenteries CBR Cementbedrijven	Boulevard de France 3-5		Braine-l'Alleud	1420	BE	Belgium	0
BE	Belgium	Former Operator Holding Account	Cimenteries CBR Cementbedrijven	Boulevard de France 3-5		Braine-l'Alleud	1420	BE	Belgium	0
BE	Belgium	Former Operator Holding Account	Cimenteries CBR Cementbedrijven	Boulevard de France 3-5		Braine-l'Alleud	1420	BE	Belgium	0
BE	Belgium	Operator Holding Account	Cimenteries CBR Cementbedrijven	Boulevard de France 3-5		Braine-l'Alleud	1420	BE	Belgium	0
BE	Belgium	Operator Holding Account	Cimenteries CBR Cementbedrijven	Boulevard de France 3-5		Braine-l'Alleud	1420	BE	Belgium	0
BE	Belgium	Operator Holding Account	Cimenteries CBR Cementbedrijven	Boulevard de France 3-5		Braine-l'Alleud	1420	BE	Belgium	0
BE	Belgium	Operator Holding Account	Cimenteries CBR Cementbedrijven	Boulevard de France 3-5		Braine-l'Alleud	1420	BE	Belgium	0
PT	Portugal	Former Operator Holding Account	Celbi	Leirosa, Marinha das Ondas		Figueira da Foz	3081-853	PT	Portugal	S
PT	Portugal	Operator Holding Account	Celbi	Leirosa, Marinha das Ondas		Figueira da Foz	3081-853	PT	Portugal	S
ES	Spain	Former Operator Holding Account	Peugeot Citroen Automóviles España S.A.	Avenida Citroen 3 y 5		Vigo	36210	ES	Spain	A
ES	Spain	Operator Holding Account	Peugeot Citroen Automóviles España S.A.	Avenida Citroen 3 y 5		Vigo	36210	ES	Spain	A
ES	Spain	Operator Holding Account	Peugeot Citroen Automóviles España S.A.	Avenida Citroen 3 y 5		Vigo	36210	ES	Spain	A
IT	Italy	Former Operator Holding Account	Goglio S.p.A. divisione imballaggi	Dell'Industria, 7		DAVERIO	21020	IT	Italy	0
IT	Italy	Operator Holding Account	Goglio S.p.A. divisione imballaggi	Dell'Industria, 7		DAVERIO	21020	IT	Italy	0
IT	Italy	Operator Holding Account	EDISON FACILITY SOLUTIONS SPA	VIA DEI VITICOLTORI 5		TRENTO	38123	IT	Italy	8
IT	Italy	Operator Holding Account	EDISON FACILITY SOLUTIONS SPA	VIA DEI VITICOLTORI 5		TRENTO	38123	IT	Italy	8
PT	Portugal	Former Operator Holding Account	Conesa Portugal, S.A. (Ex-SOPRAGOL, S.A.)	Montinho de Baixo		Mora	7490-241	PT	Portugal	S
PT	Portugal	Operator Holding Account	Conesa Portugal, S.A. (Ex-SOPRAGOL, S.A.)	Montinho de Baixo		Mora	7490-241	PT	Portugal	S
IT	Italy	Operator Holding Account	DUFERDOFIN - NUCOR S.R.L.	VIA A. DIAZ, 248		SAN ZENO NAVIGLIO	25010	IT	Italy	0
ES	Spain	Former Operator Holding Account	S.A.I.C.A.	C/San Juan de la Peña, 144		Zaragoza	50015	ES	Spain	A
ES	Spain	Former Operator Holding Account	S.A.I.C.A.	C/San Juan de la Peña, 144		Zaragoza	50015	ES	Spain	A
ES	Spain	Former Operator Holding Account	S.A.I.C.A.	C/San Juan de la Peña, 144		Zaragoza	50015	ES	Spain	A
ES	Spain	Former Operator Holding Account	S.A.I.C.A.	C/San Juan de la Peña, 144		Zaragoza	50015	ES	Spain	A
ES	Spain	Former Operator Holding Account	S.A.I.C.A.	C/San Juan de la Peña, 144		Zaragoza	50015	ES	Spain	A
ES	Spain	Operator Holding Account	S.A.I.C.A.	C/San Juan de la Peña, 144		Zaragoza	50015	ES	Spain	A
ES	Spain	Operator Holding Account	S.A.I.C.A.	C/San Juan de la Peña, 144		Zaragoza	50015	ES	Spain	A
ES	Spain	Operator Holding Account	S.A.I.C.A.	C/San Juan de la Peña, 144		Zaragoza	50015	ES	Spain	A
ES	Spain	Operator Holding Account	S.A.I.C.A.	C/San Juan de la Peña, 144		Zaragoza	50015	ES	Spain	A
ES	Spain	Former Operator Holding Account	ICT IBÉRICA S.L.	Poligono el Espartal,Camino de la Cañada Re	ctra. Castellón km 2	El Burgo de Ebro	50730	ES	Spain	B
ES	Spain	Operator Holding Account	ICT IBÉRICA S.L.	Poligono el Espartal,Camino de la Cañada Re	ctra. Castellón km 2	El Burgo de Ebro	50730	ES	Spain	B
ES	Spain	Trading Account	ICT IBÉRICA S.L.	Poligono el Espartal,Camino de la Cañada Re	ctra. Castellón km 2	El Burgo de Ebro	50730	ES	Spain	B

EU Best Practices in Data Collection and Disclosure: National Emissions Ceiling Directive

Emissions Ceiling Directive is a good example of consolidation of different policies and measures aimed at decarbonization.

Figure 26. EU Best Practices: National Emissions Ceiling Directive – Policies and Measures

Member Stat	Pam_	Single/Packa	Package_	Is in a Packa	Selected Adoptic	PaM Name	Sector	Pollutants	Reduction 2	Reduction 2	Redu	Unit	Report	tEnvelopeUrl
Croatia	17180	package	17180	no	no	Package of Measures for Energy efficiency	Energy con	CH4	0	0	0	kt/year	http://cdr.eionet.europa.eu/hr/eu/nec_revised/pams/envxof0yg	
Croatia	17180	package	17180	no	no	Package of Measures for Energy efficiency	Energy con	CO2	0	0	0	kt/year	http://cdr.eionet.europa.eu/hr/eu/nec_revised/pams/envxof0yg	
Croatia	82255	single	17180	yes	no	MEN-P-1: Integration of emissions reduction m	Energy con	CH4	0	0	0	kt/year	http://cdr.eionet.europa.eu/hr/eu/nec_revised/pams/envxof0yg	
Croatia	82255	single	17180	yes	no	MEN-P-1: Integration of emissions reduction m	Energy con	CO2	0	0	0	kt/year	http://cdr.eionet.europa.eu/hr/eu/nec_revised/pams/envxof0yg	
Croatia	75734	package	75734	no	no	Support measures to strengthen the administi	Agriculture	CH4	0	0	0	kt/year	http://cdr.eionet.europa.eu/hr/eu/nec_revised/pams/envxof0yg	
Croatia	75734	package	75734	no	no	Support measures to strengthen the administi	Agriculture	CO2	0	0	0	kt/year	http://cdr.eionet.europa.eu/hr/eu/nec_revised/pams/envxof0yg	
Denmark	76193	package	76193	no	yes	Climate and Clean Air Package	Agriculture	CO2	0	0	5415	kt/year	http://cdr.eionet.europa.eu/dk/eu/nec_revised/pams/envxkip_a	
Denmark	76193	package	76193	no	yes	Climate and Clean Air Package	Agriculture	CH4	0	0	0	kt/year	http://cdr.eionet.europa.eu/dk/eu/nec_revised/pams/envxkip_a	
Belgium	68390	package	68390	no	yes	Réduction de la consommation d'énergie fossi	Energy con	CO2	0	0	0	kt/year	http://cdr.eionet.europa.eu/be/eu/nec_revised/pams/envxj4kpq	
Belgium	22961	single	68390	yes	yes	Soutien à la production d'électricité renouvelal	Energy Sup	CO2	0	0	0	kt/year	http://cdr.eionet.europa.eu/be/eu/nec_revised/pams/envxj4kpq	
Belgium	74012	single	68390	yes	yes	Amélioration de l'efficacité énergétique	Energy con	CO2	0	0	0	kt/year	http://cdr.eionet.europa.eu/be/eu/nec_revised/pams/envxj4kpq	
Belgium	89862	single	68390	yes	yes	Projet POLLEC	Energy con	CO2	0	0	0	kt/year	http://cdr.eionet.europa.eu/be/eu/nec_revised/pams/envxj4kpq	
Belgium	68673	package	68673	no	yes	Réduction des émissions des secteurs industri	Energy con	CO2	0	0	0	kt/year	http://cdr.eionet.europa.eu/be/eu/nec_revised/pams/envxj4kpq	
Belgium	34043	single	68673	yes	yes	Mesures en matière d'énergie dans l'industrie	Energy Sup	CO2	0	0	0	kt/year	http://cdr.eionet.europa.eu/be/eu/nec_revised/pams/envxj4kpq	
Belgium	72448	package	72448	no	yes	Amélioration de l'isolation et de la qualité des l	Energy con	CO2	31.6	942	1853	kt/year	http://cdr.eionet.europa.eu/be/eu/nec_revised/pams/envxj4kpq	
Belgium	54410	single	72448	yes	yes	Modifier le régime fiscal pour les bâtiments poi	Energy con	CO2	0	0	0	kt/year	http://cdr.eionet.europa.eu/be/eu/nec_revised/pams/envxj4kpq	
Belgium	73189	single	0	no	yes	Lier l'aménagement du territoire aux enjeux di	Energy con	CO2	#	#	#	kt/year	http://cdr.eionet.europa.eu/be/eu/nec_revised/pams/envxj4kpq	

EU Best Practices in Data Collection and Disclosure: JRC Databases to Support Implementation of the Covenant of Mayors for Climate and Energy

The JRC's CoM collection provides supporting data for the Covenant of Mayors for Climate and Energy initiative.

In EU, the CoM complements national climate change strategies and plans and signatories pledge to reduce their CO_2 emissions by at least 40%, increase their resilience to the impacts of climate change and take action to alleviate energy poverty.

The JRC provides scientific and technical support to the initiative, based on its expertise in fields such as sustainable energy, climate change mitigation and adaptation and access to energy.

The JRC work includes:

- Setting the methodological basis of the initiative, including guidebooks for local authorities;
- Evaluating and approving the SECAPs of cities with a feedback procedure for EU, EU Eastern Partnership countries and European Neighbourhood South Region;
- Developing assessment reports on the CoM initiative;
- Co-chairing a technical working group on data and developing the new "standard" for city emission reporting, targets, action plans and adaptation for GCoM;
- Working on the methodological adaptation to the different regions of the world: South Mediterranean, Eastern partnerships, Sub-Saharan Africa, North America, Latin America, Japan, India, China and South-East Asia;
- Providing technical training for cities and regions and for regional experts and capacity building activities in FPI regions.

The figure below demonstrates an example of data disclosure available for cities of Moldova in JRC tools used to track a progress of CoM implementation.

Figure 27. Municipality-level Monitoring: Opportunities from JTC Tools to Track CoM Implementation Progress

organisation_id	organisation_name	coordinator_na	supporter_name	country_code	country_name	population_adhesion	organisation_latitude	organisation_longitude	group_organisation_id	group_name	commitment_CoM2020_flag	commitment_CoM2030_flag	commitment_CoM2050_flag	commitment_mayoradapt_flag	adhesion_type	signatory_status	mayor	date_of_adhesion	action_plan_expected	group_profile	gcom_id
11557	Ialoveni (Rayo	-	Congress of Local Authorities	md	Moldova, Republic	97000	46,95	28,78333	-	-	TRUE	FALSE	FALSE	FALSE	As an individual sign	on_hold	-	17.05.2011	TRUE	FALSE	-
11558	Ialoveni	-	-	md	Moldova, Republic	15300	46,94645	28,77581	-	-	FALSE	TRUE	FALSE	FALSE	As an individual sign	published	Sergiu Arm	23.09.2016	TRUE	FALSE	MD0008
13651	Antonești	-	-	md	Moldova, Republic	1042	46,4967	29,8461	-	-	TRUE	FALSE	FALSE	FALSE	As an individual sign	on_hold	-	22.10.2010	TRUE	FALSE	MD0016
13652	Drochia	-	Alliance for Energy Efficiency	md	Moldova, Republic	87083	48,0312	27,8287	-	-	TRUE	FALSE	FALSE	FALSE	As an individual sign	published	-	21.10.2010	TRUE	FALSE	MD0002
13653	Orhei	-	-	md	Moldova, Republic	116296	47,3798	28,8318	-	-	TRUE	FALSE	FALSE	FALSE	As an individual sign	on_hold	Roman Bo	21.10.2010	TRUE	FALSE	MD0030
13654	Marinici	-	-	md	Moldova, Republic	2295	43,975	17,9264	-	-	TRUE	FALSE	FALSE	FALSE	As an individual sign	on_hold	Ion Croitor	27.10.2010	TRUE	FALSE	MD0028
13655	Leușeni	-	-	md	Moldova, Republic	2166	46,8209	28,1929	-	-	TRUE	FALSE	FALSE	FALSE	As an individual sign	on_hold	Ion Dragat	08.12.2010	TRUE	FALSE	MD0026
14358	Bălți	-	-	md	Moldova, Republic	151000	47,76229	27,92965	-	-	TRUE	TRUE	FALSE	FALSE	As an individual sign	published	Renato Us	11.03.2016	TRUE	FALSE	MD0001
14367	Nisporeni	-	-	md	Moldova, Republic	64945	47,0833	28,1833	-	-	TRUE	TRUE	FALSE	FALSE	As an individual sign	published	-	15.12.2018	TRUE	FALSE	MD0029
14852	Chișinău	-	-	md	Moldova, Republic	789500	47,02262	28,83488	-	-	TRUE	FALSE	FALSE	FALSE	As an individual sign	on_hold	Dorin Chir	08.12.2011	TRUE	FALSE	MD0019
15128	Cimișlia	-	Alliance for Energy Efficiency	md	Moldova, Republic	14800	46,52275	28,78214	-	-	TRUE	FALSE	FALSE	FALSE	As an individual sign	published	Gheorghe	18.11.2011	TRUE	FALSE	MD0009
15925	Ocnița	-	-	md	Moldova, Republic	9170	48,41049	27,47837	-	-	TRUE	FALSE	FALSE	FALSE	As an individual sign	published	Galina Zal	06.09.2012	TRUE	FALSE	MD0011
16043	Strășeni	-	-	md	Moldova, Republic	18376	47,14633	28,61397	-	-	TRUE	TRUE	FALSE	FALSE	As an individual sign	published	Valentina	31.05.2021	TRUE	FALSE	MD0034
16111	Anenii Noi	-	-	md	Moldova, Republic	13856	46,82988	29,48706	-	-	TRUE	FALSE	FALSE	FALSE	As an individual sign	published	Mihail Che	26.10.2012	TRUE	FALSE	MD0010
16164	Soldanești	Mini	Alliance for Energy Efficiency	md	Moldova, Republic	6278	47,81532	28,78966	-	-	TRUE	FALSE	FALSE	FALSE	As an individual sign	published	Alexandru	09.11.2012	TRUE	FALSE	MD0014
16267	Ungheni	-	-	md	Moldova, Republic	36000	47,20417	27,79583	-	-	TRUE	FALSE	FALSE	FALSE	As an individual sign	published	Ambros Al	30.11.2012	TRUE	FALSE	MD0005
16286	Soroca	-	-	md	Moldova, Republic	37400	48,15633	28,30015	-	-	TRUE	FALSE	FALSE	FALSE	As an individual sign	published	Elena Bod	07.12.2012	TRUE	FALSE	MD0004
16295	Călărași	-	Congress of Local Authorities	md	Moldova, Republic	16100	47,25025	28,31434	-	-	TRUE	FALSE	FALSE	FALSE	As an individual sign	published	Ion Olari	14.12.2012	TRUE	FALSE	MD0018
17001	Fețelița	-	Alliance for Energy Efficiency	md	Moldova, Republic	3111	46,54264	29,57034	-	-	TRUE	FALSE	FALSE	FALSE	As an individual sign	published	Nicolae Tu	14.06.2013	TRUE	FALSE	MD0015
17021	Cantemir	-	-	md	Moldova, Republic	6300	46,271	28,2149	-	-	TRUE	FALSE	FALSE	FALSE	As an individual sign	published	Roman Ciu	28.05.2013	TRUE	FALSE	MD0013
17761	Taraclia	-	-	md	Moldova, Republic	13500	45	28	-	-	TRUE	TRUE	FALSE	FALSE	As an individual sign	on_hold	Serghei Fil	24.10.2013	TRUE	FALSE	MD0035
17830	Edineț	-	-	md	Moldova, Republic	20200	48,17177	27,29804	-	-	TRUE	TRUE	FALSE	FALSE	As an individual sign	on_hold	Constantir	10.12.2018	TRUE	FALSE	MD0025
17927	Codru	-	-	md	Moldova, Republic	15000	46,97528	28,81945	-	-	TRUE	FALSE	FALSE	FALSE	As an individual sign	on_hold	Munteanu	18.02.2014	TRUE	FALSE	MD0020
17935	Costești	-	-	md	Moldova, Republic	12037	46,86722	28,76959	20513	Costesti, R	TRUE	FALSE	FALSE	FALSE	As a group of signat	on_hold	Borta Vasi	31.03.2014	TRUE	FALSE	MD0031

CoM Default Emission Factors (Version 2022) dataset provides the default emission factors utilized in the framework of the Covenant of Mayors Initiative.

They can be used by local authorities to estimate their CO_2 or Greenhouse Gas (GHG) emissions due to:

- local consumption of fossil fuels and wastes (non-renewable);
- local consumption of biofuels, biomass, solar thermal and geothermal Renewable energy sources (RES);
- local electricity production from other RES (wind, hydroelectric, photovoltaics).

The CoM Standard default emission factors are the IPCC (2006) default factors for stationary combustion.

The LCA default emission factors have been calculating by adding to the standard emission factors, emissions from the supply chain as estimated from the European Platform on Life Cycle Assessment, as well as other databases and literature reviews.

Figure 28. Emissions Factors used in JRC CoM Database

Energy carriers		Standard (IPCC)		LCA	
Energy carriers	IPCC denomination	t CO_2/MWh	t $CO_{2\text{-eq}}$/MWh	t CO_2/MWh	t $CO_{2\text{-eq}}$/MWh
Natural gas	Natural gas	0,202	0,202	0,226	0,242
Liquid gas	Liquefied Petroleum Gases	0,227	0,227	0,276	0,287
	Natural Gas Liquids	0,231	0,232	-	-
Heating Oil	Gas/Diesel oil	0,267	0,268	0,296	0,308
Diesel	Gas/Diesel oil	0,267	0,268	0,296	0,308
Gasoline	Motor gasoline	0,249	0,250	0,301	0,314
Lignite	Lignite	0,364	0,365	0,370	0,377
Coal	Anthracite	0,354	0,356	0,371	0,395
	Other Bituminous Coal	0,341	0,342	0,357	0,382
	Sub-Bituminous Coal	0,346	0,348	0,363	0,387
Other non renewable fuels	Peat	0,382	0,383	0,388	0,391
	Municipal Wastes (non- biomass fraction)	0,330	0,337	0,429	0,437

In the context of EU and Global Covenant of Mayors for Climate and Energy, the JRC also provides the last updated emission factors for calculating GHG emissions, attributed to the electricity consumption.

The JRC-COM-NEEFE dataset includes National and European Emission Factors for Electricity Consumption (NEEFE).

The countries here reported are:

- EU-28 countries,
- Eastern and South Neighbourhood countries
- the rest of the world.

The National and European Emission Factors for Electricity related to the indirect emissions from electricity consumption are calculated by dividing total national CO_2 emissions from electricity production from all input energy carriers by the total final electricity consumption.

The NEEFE have been calculated by applying two different approaches to the energy carriers consumed to produce electricity: the IPCC "standard" and the LCA (Life Cycle Assessment) emission factors.

The figure below demonstrates an example of GHG emission factors for electricity consumption for CoM developed by JRC.

Figure 29. GHG Emission Factors for Electricity Consumption for CoM

	Tab 4.2: CoM East Countries - National Emission Factors for Electricity Consumption- IPCC Approach: tCO2/MWh										
	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
Armenia	0,551	0,773	0,639	0,143	0,193	0,387	0,398	0,381	0,452	0,355	0,396
Azerbaijan	0,815	0,859	1,156	1,234	0,969	0,922	0,932	0,937	0,934	0,909	0,966
Belarus	0,553	0,513	0,555	0,529	0,573	0,495	0,452	0,474	0,413	0,437	0,462
Georgia	0,573	0,526	0,362	0,307	0,249	0,634	0,314	0,253	0,244	0,224	0,268
Moldova	0,709	0,574	0,801	0,717	0,522	0,500	0,540	0,578	0,577	0,627	0,626
Ukraine	0,966	0,877	0,848	0,859	0,791	0,779	0,619	0,594	0,621	0,623	0,614

EU Best Practices in Data Collection and Disclosure: Climate Change Mitigation Policies and Measures

A database developed by EEA provides a comprehensive approach of aggregation of country-level information on different policies and measures included into national programme documents of EU member states aimed at mitigation of climate change impact.

The figure below demonstrates an example of such a PaM database.

The similar tool can be used to enhance the national climate change planning and reporting framework in the Republic of Moldova.

Figure 30. EU Best Practices: Climate Change Mitigation Policies and Measures (PaM) Database

Country	Report ID	Report ID	Name of policy or measure	Single policy or measure, or group of measures	ID of policy or measure	Policies or measures included in the group	Type of policy instrument	Status of implementation	Policy impacting EU ETS, ESD or LULUCF emissions	Sector(s) affected	Objective(s)_lookup_only4facets	Objective(s)	Total GHG emissions reductions in 2020 (t	Total GHG emissions reductions in 2030 (t	Entities responsible for implementing the policy (type	Entities responsible for implementing the policy	Implementation period start	Is the policy or measure related to a Union policy	Union_policies_lookup_only4facets	Related Union Policy	GHG(s) affected	Projection scenario in which the policy or measu	Link to national report	Description	Quantified objective	Implementation period finish	Indicator used to monitor and evaluate progress over	General comment	Main referen e
Austria	2909	http://cdr.eio	EU Emissi	Single	1	Single Pal	Economic	Implemen	EU ETS	Cross-cut	Cross-cut	Cross-cutting: Framework poli			National	Governm	2005	Yes	EU ETS dir	EU ETS dir	CO2; N2O	With exis	http://cdr	The objec	Emission	2030			
Austria	2909	http://cdr.eio	Domestic	Single	2	Single Pal	Economic	Implemen	EU ETS; ES	Cross-cut	Cross-cut	Cross-cut	300	300	National	Governm	1993	No	No inform	No inform	CO2; CH4;	With exis	http://cdr	The Dome	NA				
Austria	2909	http://cdr.eio	Austrian (	Single	3	Single Pal	Economic	Implemen	EU ETS; ES	Cross-cut	Cross-cut	Cross-cutting: Framework poli			National	Governm	2007	No	No inform	No inform	CO2	With exis	http://cdr	In 2007, th	NA				
Austria	2909	http://cdr.eio	Increase t	Single	4	Single Pal	Economic	Implemen	EU ETS; ES	Energy su	Energy su	Energy su	4200		National	Governm	2002	Yes	RES direct	RES direct	CO2	With exis	http://cdr	Beyond th	2010-2020	2020	Installed capacity of		Ökostr
Austria	2909	http://cdr.eio	Increase (	Single	5	Single Pal	Economic	Implemen	EU ETS; ES	Energy co	Energy co	Energy consumption: Efficiene			National	Governm	2008	Yes	Cogenera	Cogenera	CO2	With exis	http://cdr	Based on	energy efficiency ta	final energy consum			Statisti
Austria	2909	http://cdr.eio	Increase t	Single	6	Single Pal	Economic	Implemen	ESD	Transport	Transport	Transport: Low carbon fuels/e			National	Governm	2004	Yes	Biofuels c	Biofuels c	CO2	With exis	http://cdr	The EU Di	share of electric vehicles and plug-in hy				
Austria	2909	http://cdr.eio	Increase f	Single	7	Single Pal	Economic	Implemen	ESD	Transport	Transport	Transport: Improved behavio			National	Governm	2004	Yes	Other (Un	Other (Un	CO2	With exis	http://cdr	Several in	NA				
Austria	2909	http://cdr.eio	Modal shi	Single	8	Single Pal	Economic	Implemen	ESD	Transport	Transport	Transport: Modal shift to publ			National	Governm	2005	No	No inform	No inform	CO2	With exis	http://cdr	Besides o	NA				
Austria	2909	http://cdr.eio	Increased	Single	9	Single Pal	Economic	Implemen	ESD	Energy co	Energy co	Energy co	438	607	National	Governm	2006	Yes	Recast of	Recast of	CO2	With exis	http://cdr	Tightenin	NA				
Austria	2909	http://cdr.eio	Increased	Single	10	Single Pal	Economic	Implemen	ESD	Energy co	Energy co	Energy co	593	1319	National	Governm	2000	No	No inform	No inform	CO2	With exis	http://cdr	Awarener	NA				
Austria	2909	http://cdr.eio	Increased	Single	11	Single Pal	Informat	Implemen	ESD	Energy co	Energy co	Energy consumption: Efficiene			National	Governm	2007	Yes	Eco-desig	Eco-desig	CO2	With exis	http://cdr	Especially	NA				
Austria	2909	http://cdr.eio	Decrease	Single	12	Single Pal	Regulato	Implemen	ESD	Industrial	Industrial	Industrial processes: Reductic			National	Governm	2002	Yes	F-gas Reg	F-gas Reg	HFC; PFC;	With exis	http://cdr	This measure includes a.o.:- prohibition and restri					
Austria	2909	http://cdr.eio	Implemen	Single	13	Single Pal	Economic	Implemen	ESD	Agricultur	Agricultur	Agriculture: Reduction of ferti			National	Governm	2007	Yes	No inform	No inform	CH4; N2O	With exis	http://cdr	This meas	NA	2020			
Austria	2909	http://cdr.eio	Sustainab	Single	14	Single Pal	Regulato	Implemen	LULUCF	Land use,	Land use,	Land use, land use change anc			National	Governm	1975	Yes	LULUCF D	LULUCF D	CO2	With exis	http://cdr	The overa	NA				
Austria	2909	http://cdr.eio	Reduce e	Single	15	Single Pal	Regulato	Implemen	ESD	Waste ma	Waste ma	Waste management/waste: Ir			National	Governm	1997	Yes	Landfill D	Landfill D	CH4; N2O	With exis	http://cdr	To reduce	NA				
Belgium	3025	http://cdr.eio	EP-A01 : (	Single	1	Single Pal	Economic	Implemen	EU ETS	Energy su	Energy su	Energy supply: Increase in ren			Regional	Regional	2004	Yes	RES direct	RES direct	CO2	With exis	http://cdr	Regional	13% of final energy	Statistics	In Wallon		
Belgium	3025	http://cdr.eio	EP-A02 : S	Single	2	Single Pal	Economic	Implemen	EU ETS	Energy su	Energy su	Energy supply: Increase in ren			National	Governm	2004	Yes	RES direct	RES direct	CO2	With exis	http://cdr	Financial	13% of final energy	Regional	Regarding		Develo
Belgium	3025	http://cdr.eio	EP-A03 : E	Single	3	Single Pal	Fiscal	Implemen	EU ETS	Energy su	Energy su	Energy supply: Increase in ren			National	Governm	2004	Yes	RES direct	RES direct	CO2	With exis	http://cdr	Exemptio	13% of final energy	consumption covere			
Belgium	3025	http://cdr.eio	EP-A04 : F	Single	4	Single Pal	Informat	Implemen	EU ETS; ES	Energy su	Energy su	Energy supply: Increase in ren			Regional	Regional	2004	Yes	RES direct	RES direct	CO2	With exis	http://cdr	Facilitato	13% of final energy	Installed power for			
Belgium	3025	http://cdr.eio	EP-A05 : A	Single	5	Single Pal	Economic	Implemen	EU ETS	Energy su	Energy su	Energy su	2600	2746	National	Governm	2004	Yes	RES direct	RES direct	CO2	With exis	http://cdr	The major	offshore	2020	Installed	Productio	Develo
Belgium	3025	http://cdr.eio	EP-B02 : E	Single	6	Single Pal	Regulato	Implemen	EU ETS	Energy co	Energy co	Energy consumption: Demanc			Regional	Regional	2004	Yes	Effort Sha	Effort Sha	CO2	With exis	http://cdr	In the Flemish Region, the Energy Planning Decisi					
Belgium	3025	http://cdr.eio	EC-A01 : F	Single	7	Single Pal	Economic	Implemen	ESD	Energy co	Energy co	Energy co	490,83	753,97	Regional	Regional	2004	Yes	Effort Sha	Effort Sha	CO2	With exis	http://cdr	In Flanders, the electricity distribution r			Ex-ante a		
Belgium	3025	http://cdr.eio	EC-A03 : E	Single	8	Single Pal	Regulato	Implemen	ESD	Energy co	Energy co	Energy consumption: Efficiene			Regional	Regional	2004	Yes	Recast of	Recast of	CO2	With exis	http://cdr	Energy performance and certification of buildings					
Belgium	3025	http://cdr.eio	EC-A04 : A	Single	9	Single Pal	Educatio	Implemen	ESD	Energy co	Energy co	Energy consumption: Efficiene			Regional	Regional	2004	Yes	Recast of	Recast of	CO2	With exis	http://cdr	Accreditation of energy experts based on specific					
Belgium	3025	http://cdr.eio	EC-A05 : F	Single	10	Single Pal	Economic	Implemen	EU ETS; ES	Energy co	Energy co	Energy co	6479	11138	National	Governm	2004	Yes	Eco-desig	Eco-desig	CO2	With exis	http://cdr	Promoting energy e		2020		Estimatio	Develo
Belgium	3025	http://cdr.eio	EC-B01 : F	Single	11	Single Pal	Economic	Implemen	ESD; EU E	Energy co	Energy co	Energy co	3587	2871	National	Governm	2004	Yes	Effort Sha	Effort Sha	CO2	With exis	http://cdr	Financial incentives for the rational use			The mech		Develo
Belgium	3025	http://cdr.eio	EC-B02 : E	Single	12	Single Pal	Regulato	Implemen	ESD	Energy co	Energy co	Energy co	64,2	113,54	National	Governm	2005	Yes	Other (Un	Other (Un	CO2	With exis	http://cdr	Specific constraints on solid fu	evolution		Flanders:		FPS eo
Belgium	3025	http://cdr.eio	EC-B03 : S	Single	13	Single Pal	Economic	Expired	ESD; EU E	Energy co	Energy co	Energy co	26,3	25,5	National	Regional	2004	No	No inform	No inform	CO2	With exis	http://cdr	Specific rational use	2015	Number c	The feder		Develo
Belgium	3025	http://cdr.eio	EC-B05 : E	Single	14	Single Pal	Regulato	Implemen	ESD	Energy co	Energy co	Energy co	12,9	53,26	Regional	Regional	2004	Yes	Recast of	Recast of	CO2	With exis	http://cdr	Imposition of energy requirer			Flanders:		Flanders:
Belgium	3025	http://cdr.eio	EC-B05 bi	Single	15	Single Pal	Regulato	Implemen	ESD	Energy co	Energy co	Energy co	52	156	Regional	Regional	2016	Yes	Recast of	Recast of	CO2	With exis	http://cdr	Improving the ener		2020	Statistics on certific		