



“JORDAN’S FIRST BIENNIAL UPDATE REPORT”

FACILITATIVE SHARING OF VIEWS

Poland, Katowice,

December 3rd 2018



Outline

- Summary of BUR and recent development
- Experience and lessons learned from participating in the ICA process

Part I: Summary of BUR and recent development

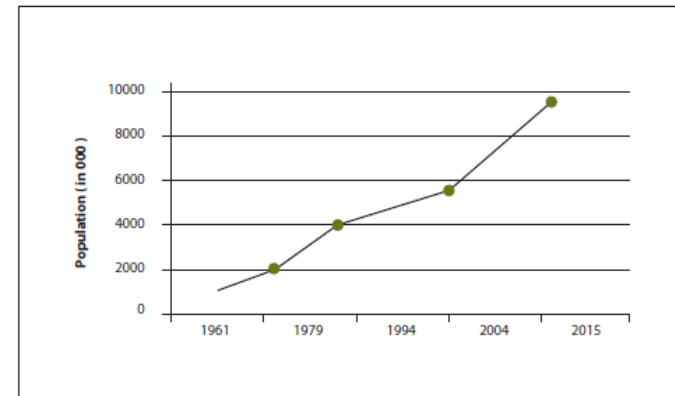
The scope of the Biennial Update Reports for non-Annex I parties according to annex III of decision 2/CP.17

(Is to provide update to the most recently submitted NC as follows)

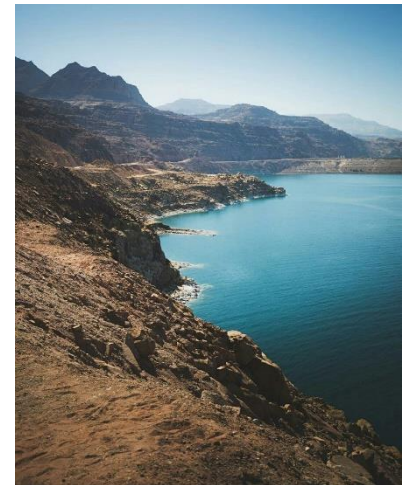
- (a) Information on **national circumstances** and institutional arrangements relevant to the preparation of the national communications on a continuous basis;
- (b) The **national inventory** of anthropogenic emissions by sources and removal by sinks of all greenhouse gases (GHGs) not controlled by the Montreal Protocol, including a national inventory report;
- (c) Information on mitigation actions and their effects, including associated methodologies and assumptions;
- (d) **Constraints and gaps**, and related **financial, technical and capacity needs**, including a description of **support needed and received**;
- (e) Information on the **level of support received** to enable the preparation and submission of biennial update reports;
- (f) Information **on domestic measurement reporting and verification**;
- (g) Any other information the Party considers relevant to the achievement of the objective of the Convention.

National context

- Middle Eastern Country, relatively small area of approximately 89 000 km²
- **Jordan's** population reached around 9.5 million (2015 Census). The population of has doubled more than 10 times over the past 55 years due to forced immigration.



- **Jordan** has diverse terrain and landscape demonstrating a variety usually found only in large countries.
- **Jordan's** climate is influenced by the country's location between the aridity of the Arabian Desert and the humidity of the eastern Mediterranean area.
- About 75% of the country can be described as having a desert climate with less than 200 millimeters of rain annually.



Milestones in Jordan's Effort- Climate Change



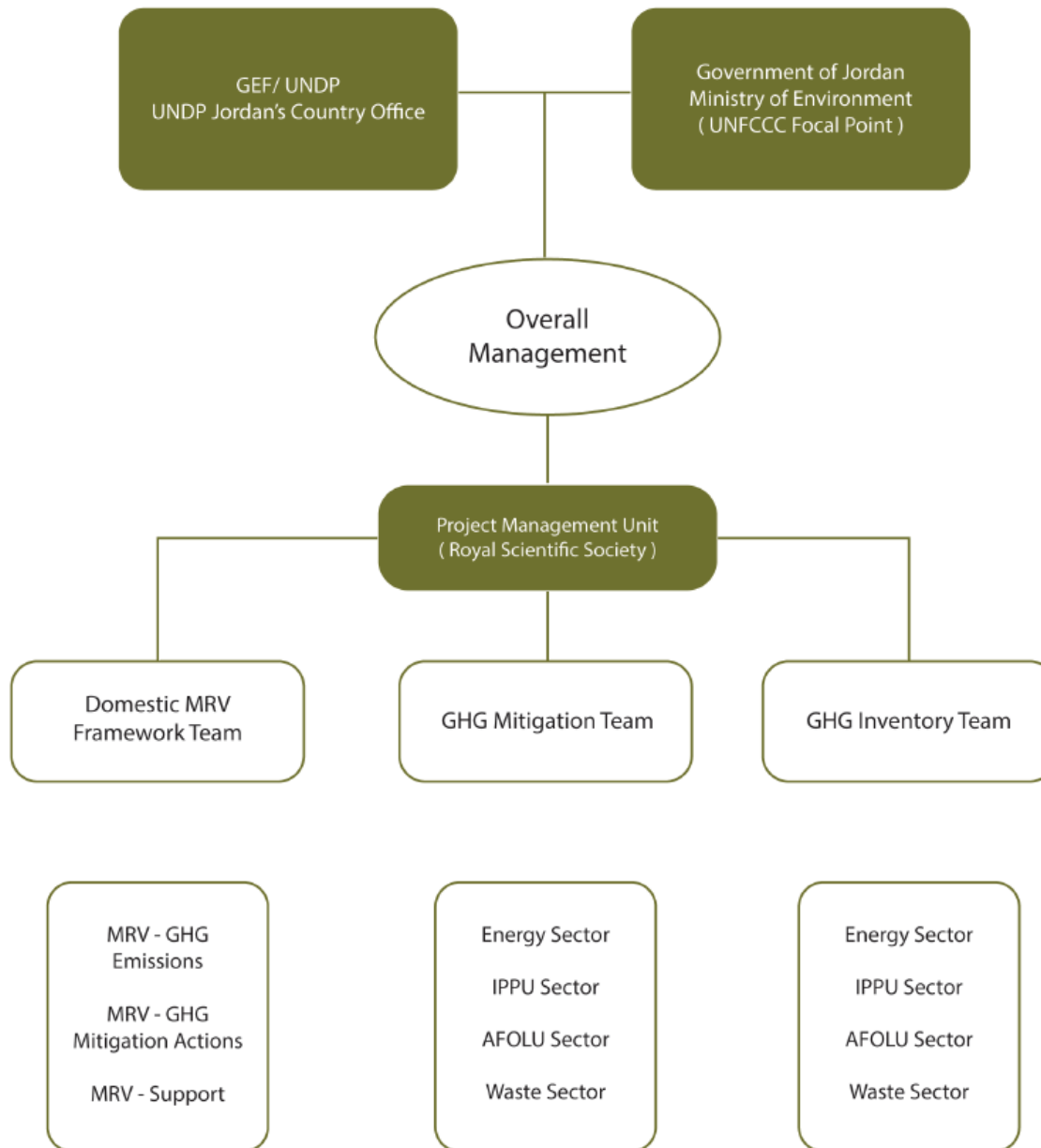
- Jordan signed the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 and ratified it in 1993.
- Jordan submitted its Initial (1998), Second (2009) and Third (2015) National Communications to the UNFCCC.
- Jordan issued a national Climate Change Policy in 2013
- Jordan submitted its Intended National Determined Contributions (INDCs) to the UNFCCC in 2014.
- Jordan has recently submitted its First Biennial Update Report (FBUR) to the UNFCCC in 2017.

Institutional arrangements

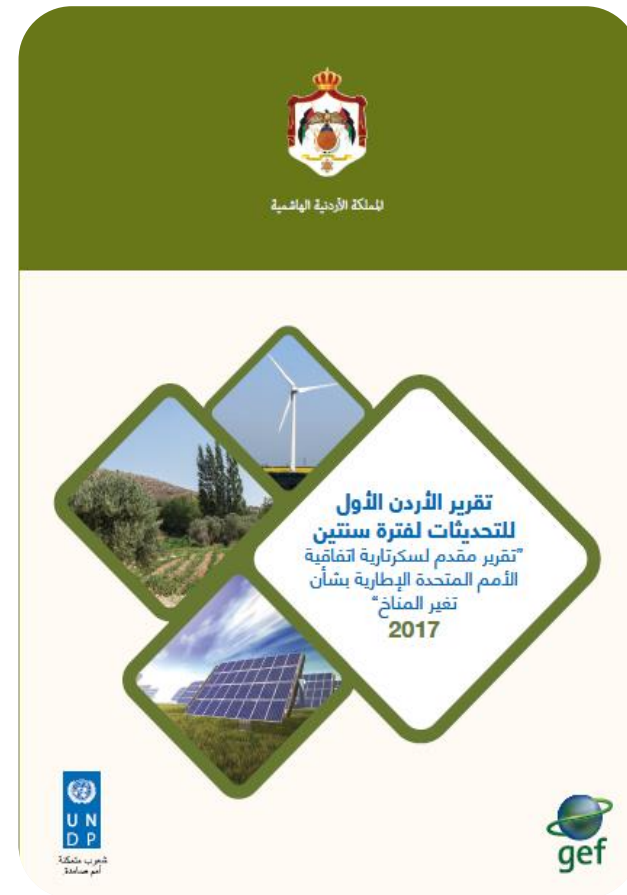
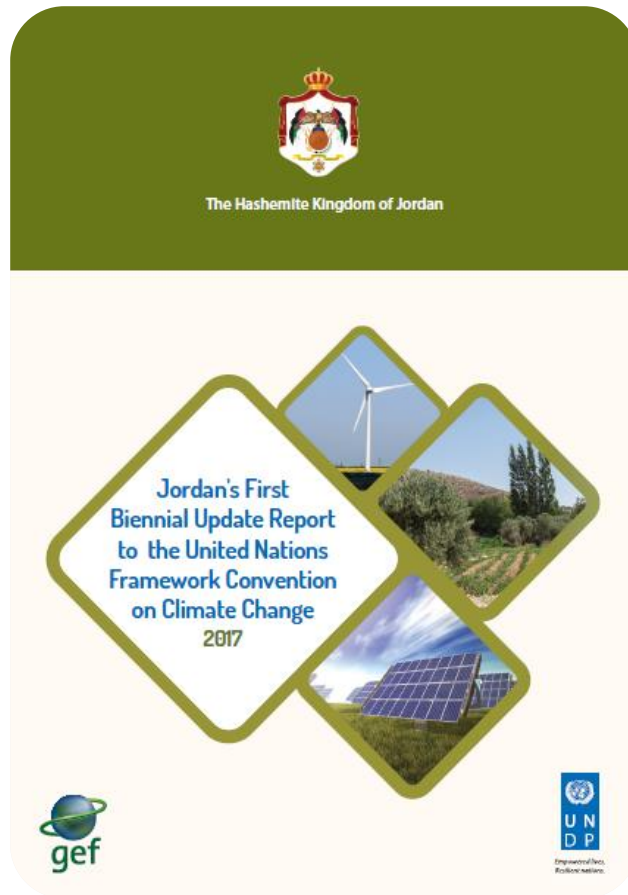
- ❖ The Ministry of Environment is the UNFCCC focal point for issues relevant to the UNFCCC and is responsible for seeing that Jordan's commitments are met.
- ❖ The preparation of Jordan's FBUR was coordinated by the Ministry of Environment in partnership with GEF/UNDP.
- ❖ The report preparation was lead by a national non-governmental, research organization "the Royal Scientific Society".
- ❖ A pool of national experts representing different national entities (around 20) took part in the preparation of the BUR

Jordan's First BUR preparation has introduced several new aspects

- Implementation modality: Ministry of Environment in cooperation with NGO- RSS
- New Methodologies introduced for the first time in the analysis:
 - IPCC Guidelines 2006 for GHG Inventory
 - LEAP for energy GHG Mitigation Analysis
- Enabling Activities:
 - Training sessions for IPCC as well as on job support
 - Mitigation analysis for different entities
 - QC/QA: internal/team review and international UNDP/UNEP GSP Review



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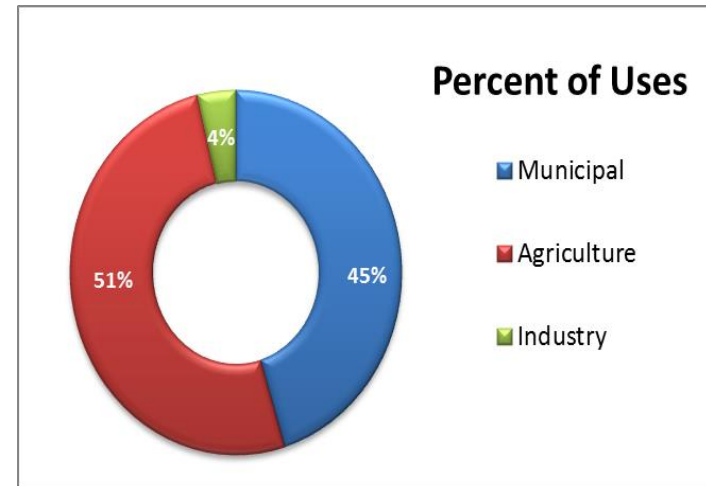


National Circumstances



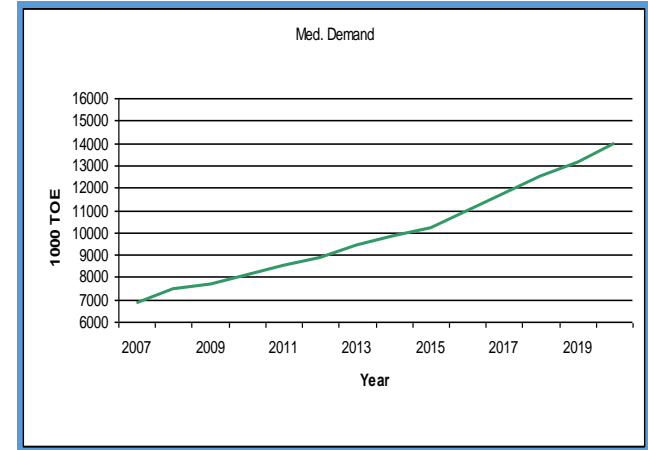
National Circumstances- Water Sector

- Jordan is known to be one of the 4 **water-poorest** countries of the world with an annual per capita share of around 130 m³/capita/year.



National Circumstances- Energy Sector

- The country imports 97% of its energy needs.
- Energy imports accounted for 18% of GDP in 2014.
- The government of Jordan launched a national Strategy for the Energy Sector in 2007 with an ambitious target of generating 7% of total primary energy supply from renewable sources by 2015 and 10% by 2020.
- The total renewable capacity by end of 2020 will be 1350 MW accounting for 25% of all installed generating capacity and contributing 20% to generated electricity.



The expected demand for primary energy is 15 million tons of oil equivalent (toe) in 2020 compared to 7.5 million in 2008.

National Circumstances

Transport Sector



- The transport sector accounts for more than 10% of GDP
- The transport sector accounted for 48% of the total final energy demand in 2015.
- Transport demand is expected to see an average growth of 5-6%.
- The current public transportation system can be described as inefficient.
- The current energy intensity of the transportation sector is considered too high as a result of a low specific load per vehicle (1.25 passenger/vehicle) and a lack of modern public transport system.
- Transport accounts for 20-25% of the income of the families.

National Circumstances

Industrial Sector



- Jordan is a non industrialized country.
- Industry in Jordan is principally dominated by manufacturing and mining.
- The industrial sector contributed directly to about 25% to the national GDP in 2014 to become the second-largest economic sector after the services sector . The sector has also contributed directly and indirectly for 40% of GDP through linkages with other key sectors such as transport, insurance, and trade.

National Circumstances-**Waste Sector**



- In Jordan, solid waste is collected from 94 municipalities in containers without segregation.
- There are 18 recorded landfills in the country, most of which are not properly designed or operated, demonstrated by their lack of proper lining, leachate collection system, and landfill gas management (LFG) system.
- There are 33 public working wastewater treatment plants in Jordan, most of which use activated sludge. They are either operated by the Water Authority of Jordan (WAJ) or managed by the Ministry of Water and Irrigation (MWI) through contracts with the private sector.

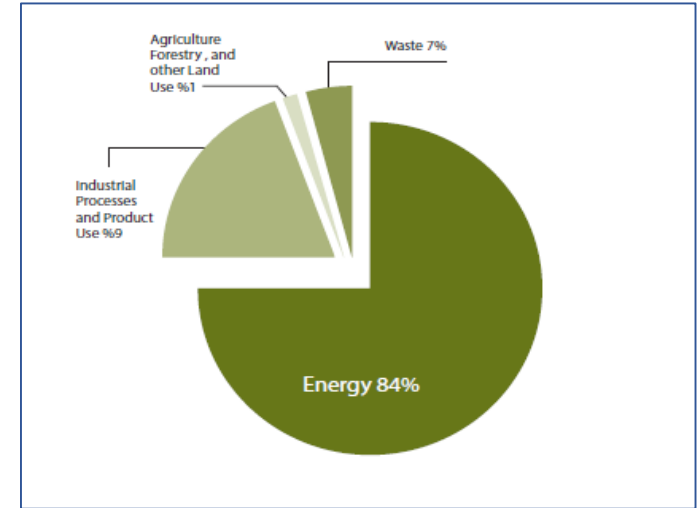
GHG Inventory

Preparation of National GHG Inventories for 2010 and 2012

- Base Year: (2010-2012).
- Sectors: (Energy, Industrial processes, Agriculture, Forestry and Other Land Use and Waste)
- Estimates will be performed according to “*2006 IPCC Guidelines for National Greenhouse Gas Inventories*”

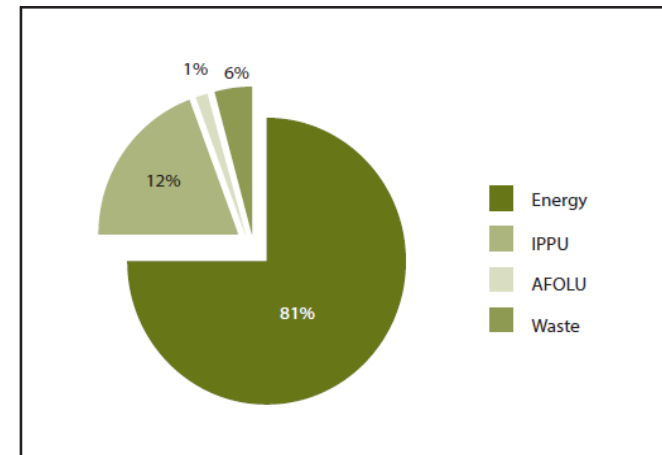
National GHG Inventory -2010

Categories	Emissions CO ₂ Equivalents (Gg)	Percentage of the overall
Total National Emissions and Removals	23140.06	100%
Energy	19410.88	84%
Industrial Processes and Product Use	1982.04	9%
Agriculture, Forestry, and Other Land Use	180.50	1%
Waste	1567.49	7%



National GHG Inventory -2012

Categories	Emissions CO ₂ Equivalents (Gg)	Percentage of the overall
Total National Emissions and Removals	27997.73	100%
Energy	22756.83	81%
Industrial Processes and Product Use	3368.47	12%
Agriculture, Forestry, and Other Land Use	237.29	1%
Waste	1635.14	6%



GHG Source and Sink Categories	Gg CO ₂ -Eq	Sectors (%)	Subsectors (%)
Total National Emissions and Removals	27998	100%	
1 - Energy	22757	81%	
1.A - Fuel Combustion Activities	22756	81%	
1.A.1 - Energy Industries	11296		40%
1.A.2 - Manufacturing Industries and Construction	1249		4%
1.A.3 - Transport	7392		26%
1.A.4 - Other Sectors	2334		8%
1.A.5 - Non-Specified	485		2%
2 - Industrial Processes and Product Use	3368	12%	
2.A - Mineral Industry	1531	5%	
2.A.1 - Cement production	1163		4%
2.A.2 - Lime production	8		0%
2.A.3 - Glass Production	0		
2.A.4 - Other Process Uses of Carbonates	360		1%
2.B - Chemical Industry	157	1%	
2.B.2 - Nitric Acid Production	157		
2.C - Metal Industry	40	0%	
2.C.1 - Iron and Steel Production	40		
2.D - Non-Energy Products from Fuels and Solvent Use	227	1%	
2.D.1 - Lubricant Use	227		
2.F - Product Uses as Substitutes for Ozone Depleting Substances	1399	5%	
2.F.1 - Refrigeration and Air Conditioning	1193		4%
2.F.3 - Fire Protection	206		1%
2.G - Other Product Manufacture and Use	14	0%	
2.G.3 - N ₂ O from Product Uses	14		

GHG Source and Sink Categories	Gg CO₂-Eq	Sectors (%)	Subsectors (%)
Total National Emissions and Removals	27998	100%	
3 - Agriculture, Forestry, and Other Land Use	237	1%	
3.A - Livestock	480		2%
3.A.1 - Enteric Fermentation	448		
3.A.2 - Manure Management	32		
3.B - Land	-254		-1%
3.B.1 - Forest land	-254		
4 - Waste	1635	6%	
4.A - Solid Waste Disposal	1488		5%
4.C - Incineration and Open Burning of Waste	5		0.02%
4.D - Wastewater Treatment and Discharge	142		1%

Key source Analysis

In the total national GHG emissions various Fuel Combustion Activities subcategories were among the top five sources accounting for around 65-75% of all emissions, mainly:

- Energy Industries (Gaseous Fuels),
- Energy Industries (Liquid Fuels),
- Road Transportation,
- Manufacturing Industries and Construction (Liquid Fuels), and
- Other sectors (commercial/institutional and residential-Liquid Fuels).

Mitigation Actions and Effects

Key Parameters for Mitigation Analysis

- Timeframe (2015-2040)
- Scope (Primary energy & energy demand, RE, EE, Transport, AFOLU, solid waste & wastewater, Industrial processes).
- Methodologies:
 - Baseline Scenario
 - Mitigation Scenario
 - Using LEAP SOFTWARE for Energy Analysis.

Mitigation Projects Tabular Updates

Name and brief description of the mitigation action	Sector and subsector (and GHG reduced)	Implementing institution	Status	Main assumptions used in the mitigation analysis	Project Duration	Emission reductions during project duration (Gg of CO ₂ eq)
Electricity T&D Network Losses	Electricity (CO ₂ , N ₂ O, CH ₄)	NEPCO and Distribution Companies	planned	Reduce the T&D losses to 12% in 2022 compare to 16% in 2015	2017-2022	8435
Adding a 100 MW Combined cycle in AsSamra Power Plant	Electricity (CO ₂ , N ₂ O, CH ₄)	CEGCO	planned	Utilize the waste heat	2018-2019	3564
Natural Gas Distribution Network in Amman, Zarqa, Aqaba	Supply (CO ₂ , N ₂ O, CH ₄)	MEMR and Private Sec.	planned	Replace the Oil products with NG in demand sectors	2020-2030	3442
Demand Side Management	Electricity (CO ₂ , N ₂ O, CH ₄)	NEPCO and Distribution Companies	planned	Reduce the system peak load	2018-2022	2842

OBJECTIVE OF THE MITIGATION ACTION

The objective of these mitigation actions is to reduce emissions by:

- Reducing electricity consumption which will result in reduced quantity of fuels used for electricity generation.
- Replacing used fuel oil products with natural gas.

Status of the TNC primary energy mitigation projects

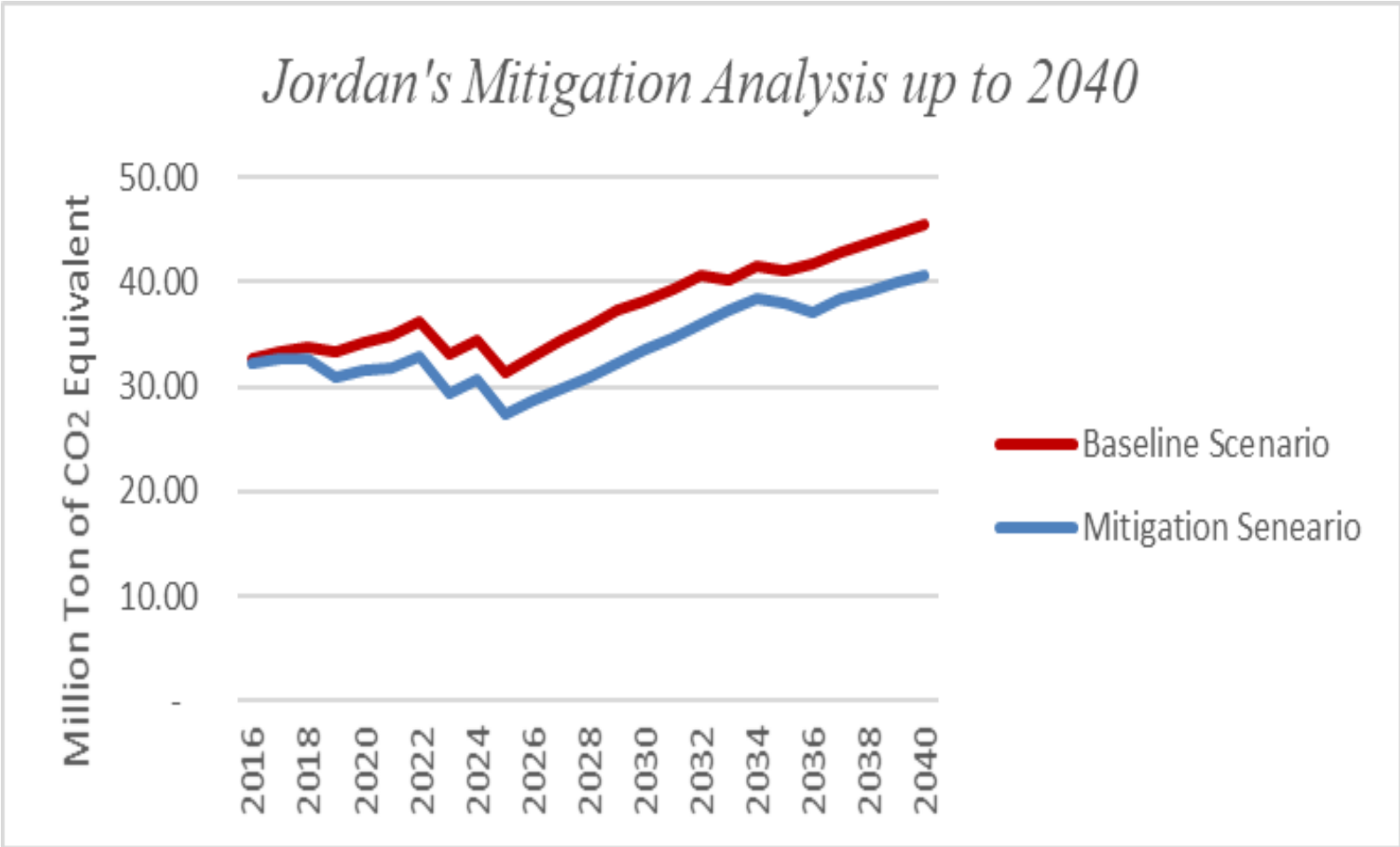
Project Name	Status
Loss Reduction in Electricity Transmission and Distribution Network	Still valid and considered in the current mitigation scenario
Improving Combustion in Rehab Power Plant	Cancelled -no longer valid
Combined Cycle Gas Turbine in Risha Plant	Cancelled due to reduction of natural gas production and delay in implementation of Risha field development
Distribution Network of Natural Gas in Aqaba	Still valid and considered in the current mitigation scenario to include Zarqa and Amman in addition to Aqaba
Demand Side Management	Still valid and considered in the current mitigation scenario
Nuclear Power Plant (1000 MW)	Moved from the TNC mitigation scenario and considered within current BUR baseline scenario according to the updated energy strategy 2015-2025

Projects and main outcomes

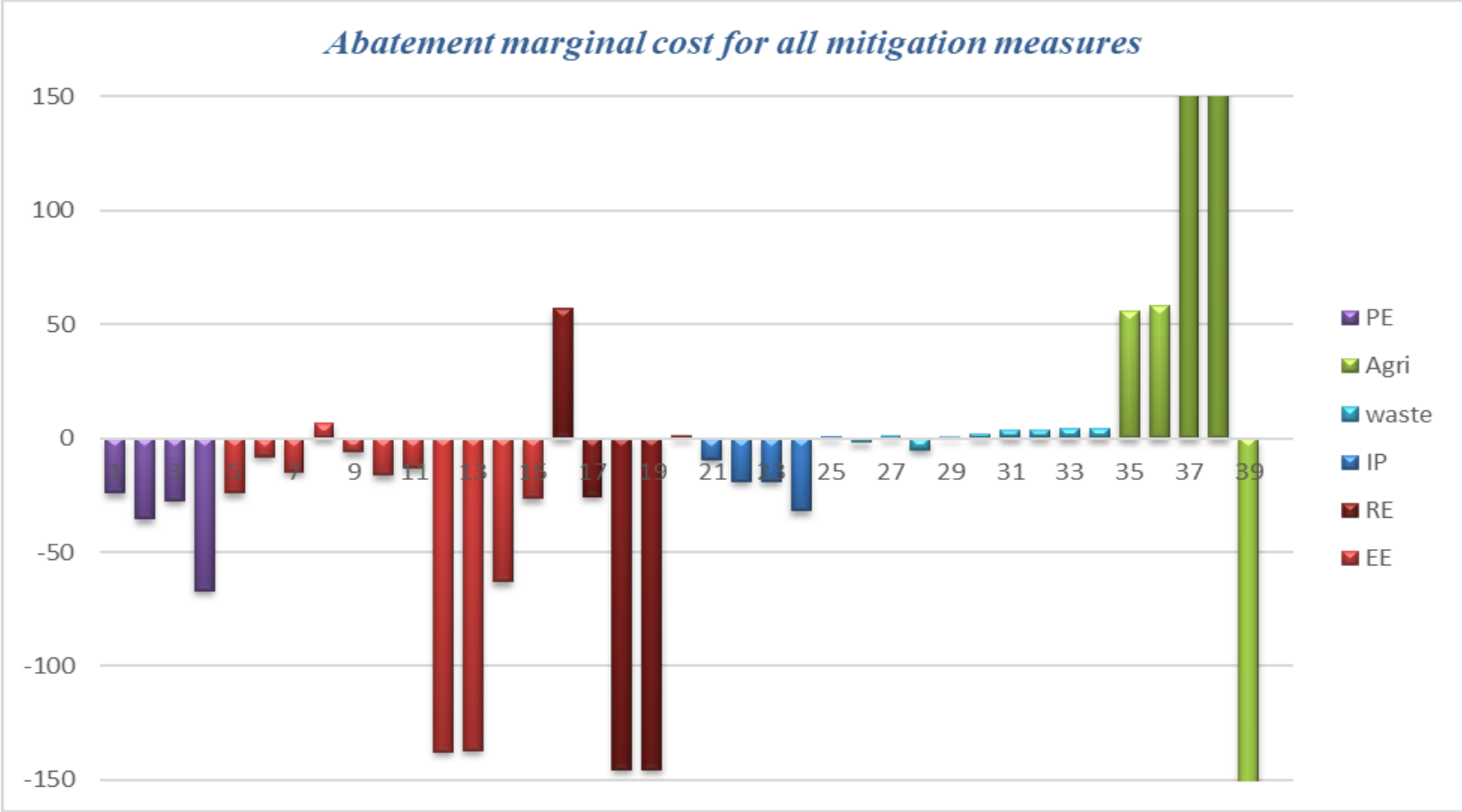
- Thirty-nine GHG mitigation projects have been proposed in several sectors and subsectors including primary energy, RE-EE, waste, and agriculture.
- The cumulative GHG emissions reduction in 2025 and 2040 were 7.85 and 9.32 million ton of CO₂eq, respectively.

Year	Baseline Scenario	Mitigation Scenario	Avoided	Cumulative Reduction
	Million Ton of CO ₂ Equivalent			
2020	34.33	31.65	2.68	4.95
2025	31.45	27.44	4.01	7.85
2030	38.18	33.64	4.53	9.46
2035	40.99	38.07	2.92	5.96
2040	45.56	40.73	4.83	9.32

Mitigation scenario compared with the baseline scenario, 2016-2040



Abatement Marginal Cost (JD/ton of CO₂eq) for all Mitigation Measures Grouped by Sector



NAMAs AND CDM

- Jordan has limited experience with **NAMAs** and **clean development mechanism** (CDM) projects.
- CDM: Out of 15 project proposals that received letters of approval from the Ministry of Environment, the **Designated National Authority** (DNA), only 4 projects have been registered.
- 10 proposed projects: 9 concept notes need support for preparation, and one needs support for implementation.

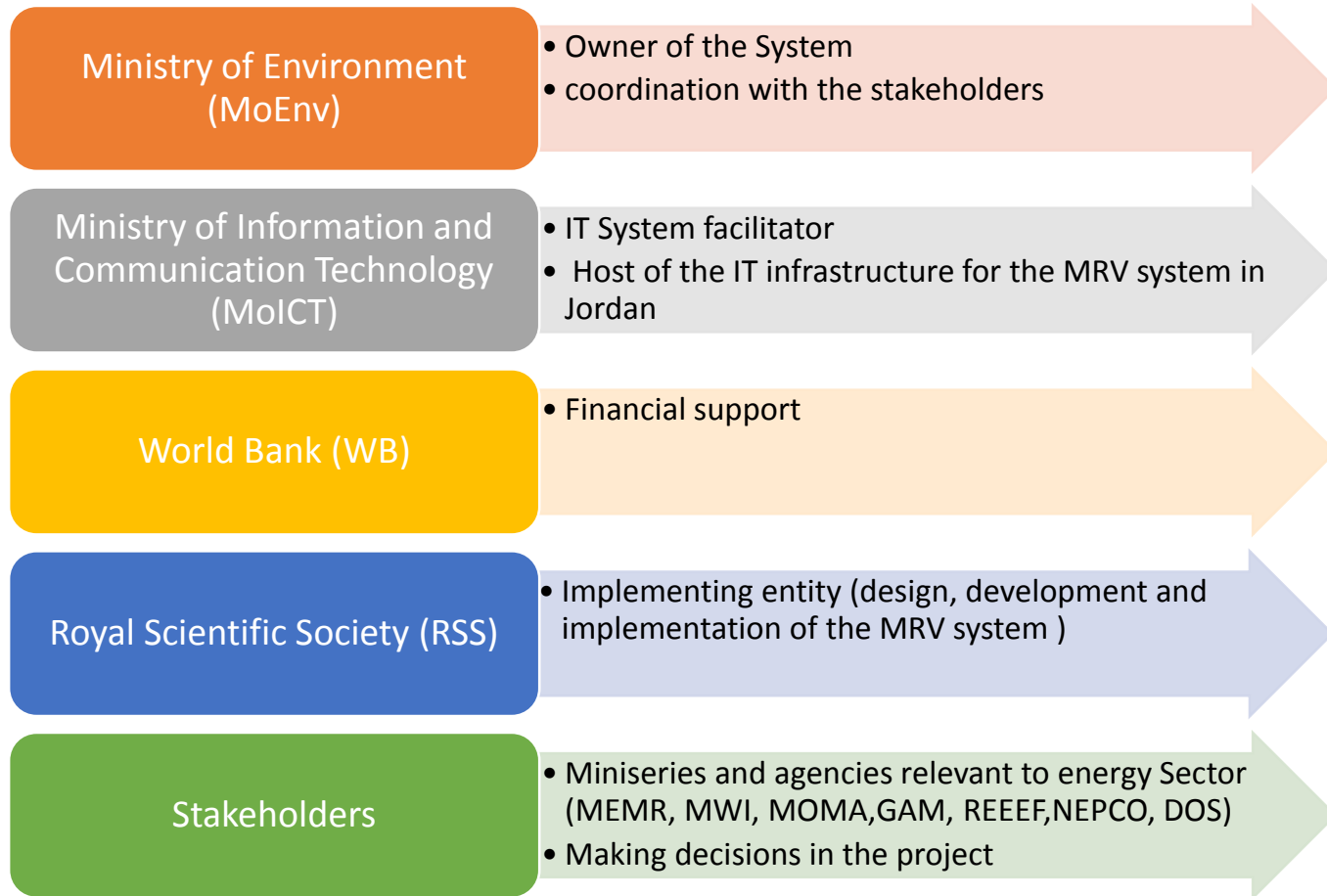
Lessons learned:

- There is a need to strengthen **institutional frameworks** and **technical capacity** in order to deliver verified mitigation activities.
- This includes the need to **develop capacities** for gathering data and for monitoring and verifying the effect of mitigation actions.

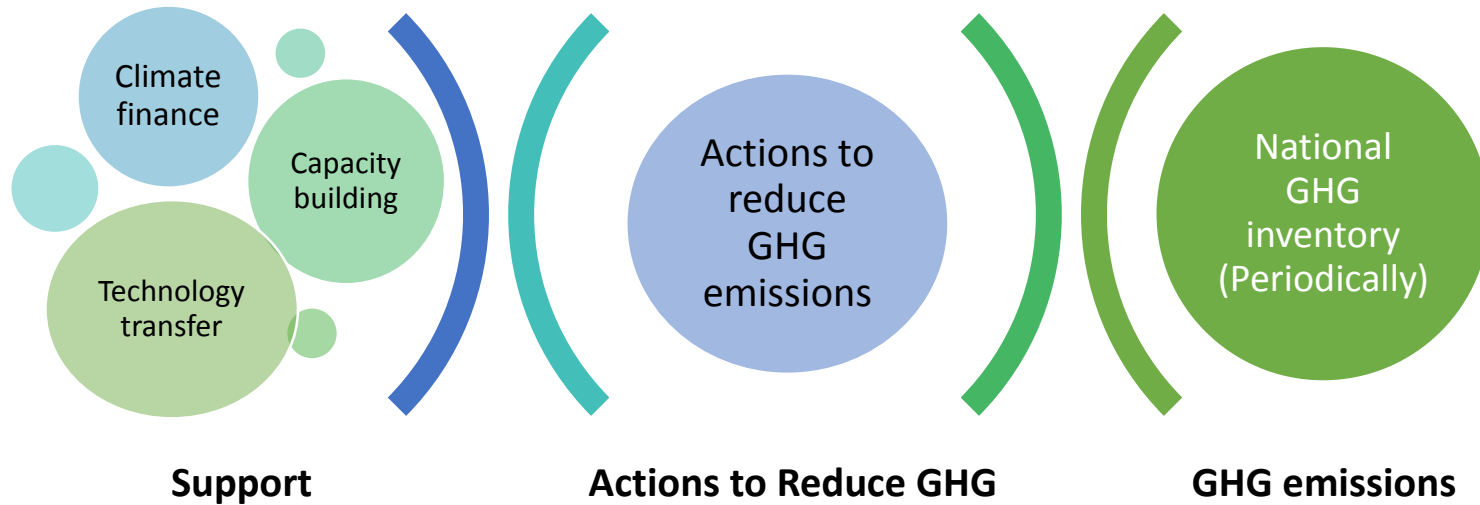
Developing Multi-level integrated
Monitoring, Reporting and Verification (**MRV**)
system for Jordan

MRV System Organizations

(BUR and the ongoing MRV project)

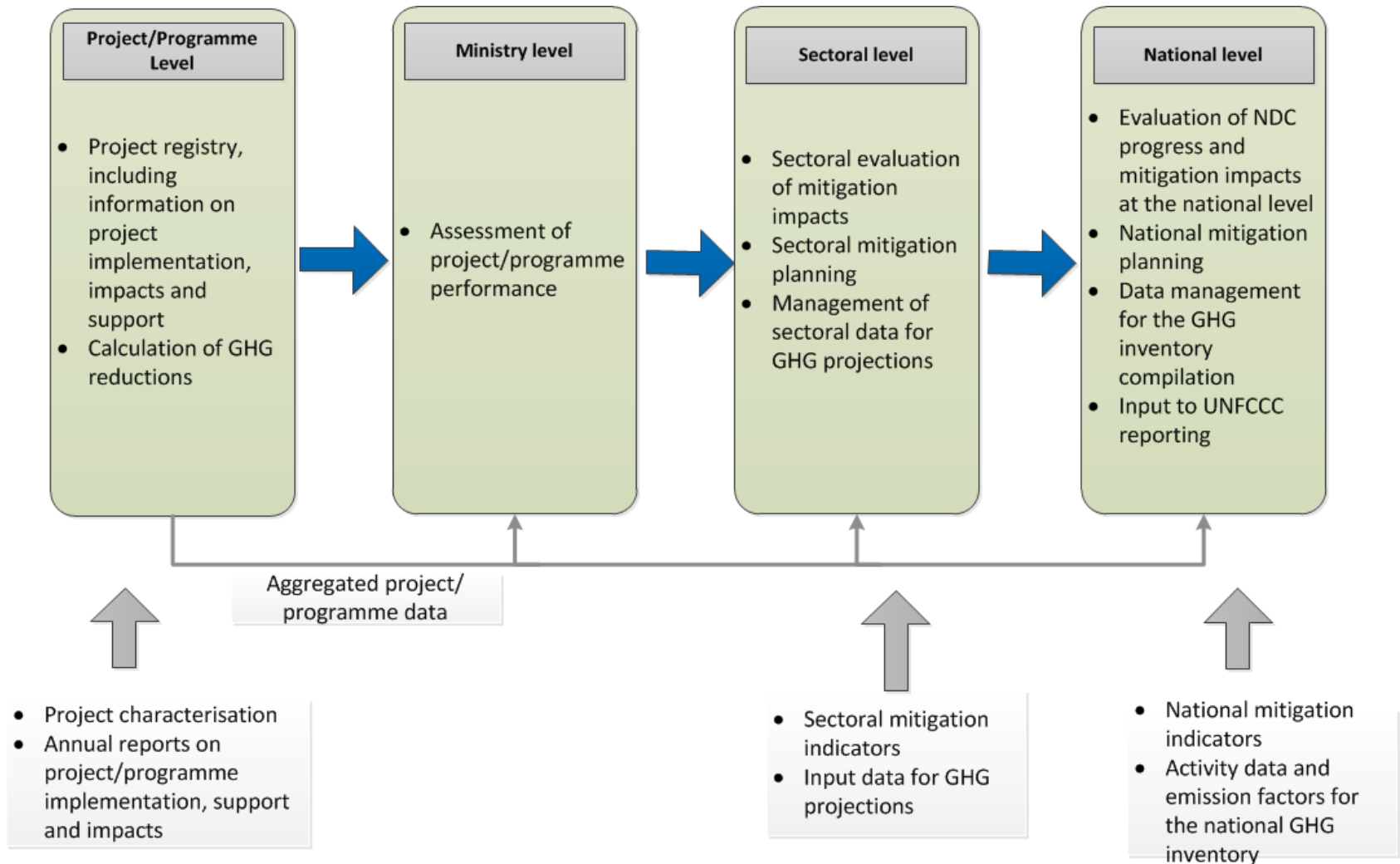


Pillars of domestic MRV system



MRV System levels

The expected output will be **an automated web-based system** designed to benefit all stakeholders



Obstacles and barriers



Institutional Constraints and Gaps and Policy Mainstreaming

- Jordan adopted its National Climate Change Policy (NCCP) in 2013.
- The Intended Nationally Determined Contribution (INDCs), submitted in 2015, proposes to reduce Jordan's GHG emissions by 14% by 2030, driven by sectoral policies.

The implementation plans/programs and measures relies on the existing laws, agendas, and strategies of the related ministries to provide an enabling environment

Currently Jordan drafted a climate change by-law

Technical and Capacity Building Gaps and Needs

GHG inventories are estimated only as part of a NCs preparatory project, and thus lacked continuity and sustainability

- **Data** were collected by sending paper letters requesting data from potential data providers, a process that was both time consuming and tedious.
- There was a lack of institutional arrangement to support collection of **data** needed for estimating the national GHG inventory, particularly from the private and industrial sector.
- **Data** quality, completeness, and accuracy were a primary concern. In addition, most data were available in a format and units not suitable for GHG inventory estimation.
- The lack of disaggregated **data** was a barrier to improving the bottom up estimation.

Technical and Capacity Building Needs- GHG Inventory

- There is a need to build capacity **in the use of the 2006 IPCC Guidelines and Software**.
- The National GHG Inventories did not provide emission estimates for **indirect GHGs** such as (CO), (NO_x), non-methane volatile organic compounds (NMVOC), and other gases not controlled by the Montreal Protocol, such as sulphur oxides (SO_x) because the 2006 IPCC Software does not support the estimation of those gases and **estimation needs referring to different guidelines**.
- The National GHG Inventories of 2010 and 2012 have been estimated using the 2006 IPCC Guidelines, which have structural and methodological differences with the Revised 1996 IPCC Guidelines used in estimating GHG emissions inventories for earlier (NCs), which made **it difficult to provide a consistent time series**.
- **Default emission factors (EFs)** were used since there are no available national emission factors (particularly for key categories).

Technical and Capacity Building Needs Mitigation

- There is limited experience in Jordan in mitigation model analysis. The LEAP software has been newly introduced to Jordan.
- The Jordanian case has been developed as project-based rather than as a program-based scenario.
- Stakeholders had limited expertise and knowledge for conducting mitigation analysis for the sectors: transport, IPPU, AFOLU, and waste sectors.
- Data quality, completeness, and accuracy are of a primary concern when it comes to establishing the baseline and mitigation analysis.
- Data are not-up-to date, nor are they readily available in one place.

Technology Needs Assessment

- The Ministry of Environment, with GEF-UNDP support, has earlier published a technology needs assessment (TNA) and technology transfer report for 2015-2017
- The report has also provided a combined technology action plan (TAP) for the three priority technologies for each sector and key projects have been suggested to turn ideas into action.

Support received

GEF

- Preparation of National Communications and the Preparation of Jordan's First Biennial Update Report.
- National Environmental, Economic, and Development Study (NEEDS) for Climate Change, prepared by the Ministry of Environment, 2010.
- Developing Policy-relevant Capacities for the Implementation of Global Environmental Conventions, implemented by the Ministry of Environment in cooperation with UNDP and with support from GEF, 2010.
- Jordan Climate Change Policy, supported by UNDP/GEF, 2013.

Adaptation Fund:

- Increasing the resilience of poor and vulnerable communities to climate change impacts in Jordan through implementing innovative projects in water and agriculture in support of adaptation to CC

Green Climate Fund:

- One concept note under review

Example of a template to track Support

Support Received							
Year	Project	Donor/Implementing Agency	Type of Support				Project Objectives
			Financial Resources	Capacity Building	Technical Support	Technology Transfer	
Implementation period	Project name	Donor name implementing agency name	Grant, loan, or own budget	X	X	X	Description of project main objectives
2015-2019	Strengthening Resilience for communities working in Agriculture	Donor: Adaptation fund Implementing agency: MOPIC	Grant (USD 9,226,000)	X	X	X	The program seeks through its 1 st component to support climate change adaptation in the agricultural and water sectors through technology transfer (the use of non-conventional water resources, rain water harvesting, and permaculture). The 2 nd component seeks to strengthen climate change adaptation capacities at the national and local community levels, respectively, knowledge dissemination, and policy and legislation mainstreaming.

Part II: Experience and lessons learned in participating in the ICA process

The ICA process

Jordan's first participation in the technical analysis opened the door for several improvements, in terms of:

- **Preparation and team mobilization phase:** the need to have a sustainable process with fixed institutional arrangements and archiving system
- **Implementation phase:** capacity building for technical aspects (IPCC, LEAP, uncertainty, data gaps, and time series)
- **Review and Validation phase:** the importance of involving stakeholders and data sources at all levels
- The ICA helped a lot while writing the new National Communication and BUR Project note and Project document to GEF asking for support

❖ Added value for the technical analysis process of the BUR and the team of technical experts.

Since the country has limited financial and human resources, the TTE has helped Jordan where to start and where to focus the efforts,

The ICA process helped in the identification and prioritization of the capacity building needs thus contributing to raising the profile of climate reporting at the domestic level

❖ The ICA process supported the country to identify and capacity building needs Jordan as part of the TTE process held meetings with the BUR teams and the Ministry of Environment to prioritize capacity-building needs

Capacity-building needs identified in consultation with Jordan as an outcome of the TTE

GHG Inventory

- Enhance technical capacity on the use of surrogate data and other splicing techniques from IPCC Guidelines that can help fill gaps of historical data and generate a consistent time series. (Immediate, high priority)
- Develop technical capacity for data collection and estimation of emissions of HFC on a gas-by-gas basis, in particular CBNs related to the collection of data from equipment disposal; and the processing of raw data from custom department and other national and / or international sources. (Immediate, high priority)
- Develop technical capacity to perform key source category analysis, in particular CBNs for the execution of level and trend analysis; and the use of the outcomes of key category analysis. (Immediate, high priority)
- Enhance technical capacity for the development of national emission factors and use of higher tier methods in the categories defined as key and in particular in AFOLU and Waste sectors. (Medium priority)
- Develop technical capacity to perform uncertainty analysis, in particular CBNs for the quantification of uncertainties of activity data and EFs/parameters of each source / sink sector; and the use the outcomes of uncertainty analysis. (Immediate, high priority)

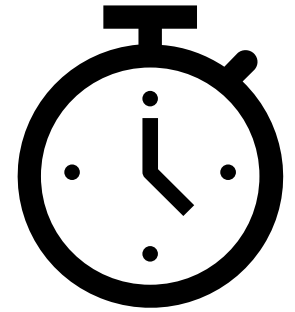
Capacity-building needs identified in consultation with Jordan as an outcome of the TTE

Mitigation actions and effects

- Enhance technical capacity to report on mitigation actions that are already implemented or on-going across all sectors (**Medium priority**)
- Enhance technical capacity for the establishment of a verification and tracking system of GHG reductions for various mitigation actions across all sectors (**Medium priority**)
- Enhance technical capacity to conduct continuous up to date surveys to provide accurate data and to integrate climate change questions in existing energy surveys which mainly focus on energy. (**Immediate, high priority**)
- Enhance capacity in the reporting progress and underlying steps envisaged for the planned mitigation actions before and when they are implemented. (**Medium priority**)
- Capacity building in reporting progress and underlying steps envisaged for the planned mitigation actions and when they will be implemented (**Medium priority**)
- Capacity building need in analysis of emission reductions during implementation period for each mitigation action. (**Medium priority**)

Needs and Support received

- Enhance capacity for data collection, project labelling and tracking of information for reporting the technology support received. (**Immediate, high priority**)



Part III: Questions



Thank you for your attention



The Treasury in Petra –South Jordan