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LEBANON

Institutional arrangements for GHG inventory preparation

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Outline

- The evolution of GHG Inventory's institutional arrangements
- Challenges and solutions
- Contribution of LECB project in reinforcing the national inventory system

Country profile



Population : 4.5 Million
Surface area: 10,452 km²

Main economical sectors :

Service	45%
Trade	23%
Industry	12%
Agriculture	5%

GHG inventory preparation under the mandate of Ministry of Environment, as part of the National Communication Process

Most emitting sub-sectors

Table 2-2 Analysis of key categories for the year 2000

Sector	Source Categories	GHG	Emission Estimate (non-LULUCF) (Gg CO ₂ eq.)	Total absolute estimate incl. LULUCF (Gg CO ₂ eq.)	Percent of total (%)	Cumulative level incl LULUCF (%)
Sum	Sum		12,681.3	12,681.3		
1.A.1 Energy	Stationary Combustion: Fuel oil	CO ₂	4,091.5	4,091.5	22.2%	22.2%
1.A.3 Energy	Mobile Combustion: Road Vehicles	CO ₂	3,929.4	3,929.4	21.3%	43.5%
1.A.2 Energy	Emissions from Manufacturing Industries and Construction	CO ₂	2,830.6	2,830.6	15.4%	58.9%
1.A.1 Energy	Stationary Combustion: Gas diesel oil	CO ₂	1,661.4	1,661.4	9%	67.9%
6.A Waste	Emissions from Solid Waste Disposal Sites	CH ₄	1,640.0	1,640.0	8.9%	76.8%
2.A Industrial Processes	Emissions from Cement Production	CO ₂	1,630.9	1,630.9	8.8%	85.6%
4.D Agriculture	(Direct and Indirect) Emissions from Agricultural Soils	N ₂ O	820.5	820.5	4.5%	90.1%
1.A.4 Energy	Other Sectors: Agriculture/Forestry/ Fishing	CO ₂	493.1	493.1	2.7%	92.7%
1.A.4 Energy	Other Sectors: Residential	CO ₂	443.5	443.5	2.4%	95.2%
1.A.4 Energy	Other Sectors: Commercial	CO ₂	336.7	336.7	1.8%	97%

Institutional arrangements

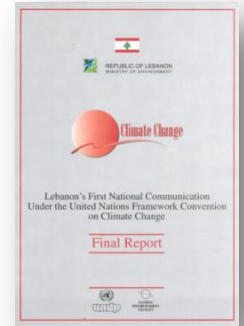
● Initial National Communication -1997-1999

Base year: 1994

Time-series: None

Methodology: Revised 1996 IPCC guidelines

- × Not very clear how the inventory AD was collected
- × No institutional memory was preserved at MoE
- × The data was collected on a one-time basis through subcontracting an academic institution



Institutional arrangements (2)

● Second National Communication -2007-2011

Base year: 2000

Time-series: 1994-2004

Methodology: Revised 1996 IPCC guidelines



- × Data types and sources were re-identified
- × Data was collected through official ministry's requests
- × Calculation was done by subcontracting an academic institution
- × Results were shared and discussed with stakeholders on a general level (not sectoral level)

Institutional arrangements (3)

● Third National Communication -2012-current

Base year: 2005

Time-series: 1994-2012

Methodology: Revised 1996 IPCC guidelines

- × Building on SNC experience and data collection
- × Data streams and databases were identified (Ministry of industry database, Central administration of statistic , Ministry of agriculture, etc.)
- × Data was collected through official ministry's requests and focal points → Sectoral focal points have been nominated by all relevant institutions and roles identified
- × Calculation was done by subcontracting sectoral experts
- × Expert consultation meetings are being organized for each sector throughout the inventory preparation process

TNC inventory system

Data	Source
Power	<ul style="list-style-type: none"> - Ministry of Energy and Water (reference approach) - Survey of RCI sector (sectoral approach)
Transport	<ul style="list-style-type: none"> - Ministry of Energy and Water (fuel import) - Ministry of Interior (car fleet characteristics) - DG air and maritime transport (domestic aviation and navigation and off-road transport) - Pilot study with private fuel distribution company (Kms driven, fleet characteristics, fuel mix use, etc.)
Industries	<ul style="list-style-type: none"> - Ministry of Industry - Ministry of Environment - Private industries and associations
Agriculture	<ul style="list-style-type: none"> - Ministry of Agriculture - Customs - FAO - Association of farmers
LULUCF	<ul style="list-style-type: none"> - Academic institutions - Municipalities
Waste	<ul style="list-style-type: none"> - Ministry of Environment - Private waste management companies - Council for Development and Reconstruction

Validation
Expert consultation meetings

Compiler
Climate Change Team MoE

Documenting system for NIS

ENERGY

N₂O

Non-CO₂ from fuel combustion by source categories

Worksheet: 1-3

$$\begin{aligned}
 & \left(\begin{aligned}
 & \text{(Fuel Consumption x Conversion Factor)}_{\text{Residual Fuel oil}} \times \text{sectoral EF}_{\text{N}_2\text{O}} \\
 & + \text{(Fuel Consumption x Conversion Factor)}_{\text{Gas/Diesel oil}} \times \text{sectoral EF}_{\text{N}_2\text{O}} \\
 & + \text{(Fuel Consumption x Conversion Factor)}_{\text{LPG}} \times \text{sectoral EF}_{\text{N}_2\text{O}} \\
 & + \text{(Fuel Consumption x Conversion Factor)}_{\text{Lubricants}} \times \text{sectoral EF}_{\text{N}_2\text{O}} \\
 & + \text{(Fuel Consumption x Conversion Factor)}_{\text{Gasoline}} \times \text{sectoral EF}_{\text{N}_2\text{O}} \\
 & + \text{(Fuel Consumption x Conversion Factor)}_{\text{Other Kerosene}} \times \text{sectoral EF}_{\text{N}_2\text{O}}
 \end{aligned} \right) / 1000\ 000 \\
 & \text{For Each sector}
 \end{aligned}$$

Fuel Consumption (1000 t)		2000	2001	2002	2003	2004	2005	2006
Energy Industries	Residual Fuel oil	1,294.362	1,355.081	1,237.722	963.130	961.512	1,219.071	956.609
	Gas diesel oil	532.805	573.072	754.411	825.984	842.354	781.743	1,057.704
Manufacturing industries and construction	Gas/Diesel oil	485.855	597.762	563.086	621.025	557.807	495.602	323.132
	Residual Fuel oil	213.541	383.768	345.719	321.816	421.094	141.106	83.108
	LPG	24.768	23.660	23.224	30.772	33.035	24.920	24.168
Transport	Lubricants	37.742	37.064	29.39	28.435	32.908	33.814	29.855
	Gasoline	1,263.757	1,178.800	1,180.374	1,260.417	1,263.245	1,273.104	1,224.607
Commercial/Institutional	Gas/Diesel oil	14.472	16.482	17.896	19.206	18.778	17.067	17.160
	Gas/Diesel oil	54.799	67.215	63.728	70.223	63.314	56.414	37.700
Residential	LPG	56.141	53.629	52.641	69.750	74.879	56.485	54.780
	Other Kerosene	1,362.25	1,362.25	1.765	0.465	2.158	1.061	1,362.25
Agriculture/Forestry/Fishing	Gas/Diesel oil	62.627	76.816	72.832	80.255	72.359	64.474	43.085
	LPG	82.560	78.866	77.412	102.574	110.115	83.066	80.558
Agriculture/Forestry/Fishing	Gas/Diesel oil	156.568	192.042	182.08	200.63	180.89	161.185	107.71
	LPG	1.651	1.577	1.548	2.05	2.2023	1.661	1.611

Conversion Factor (TJ/1000t)	
Gasoline	44.8
Other Kerosene	44.75
Gas/Diesel oil	42.526
Residual Fuel oil	41.27
LPG	47.31
Lubricants	40.19

Sectoral N ₂ O Emission Factor (kg/TJ)		
Energy Industries	0.6	
Manufacturing industries and construction	0.6	
Transport	Gasoline	0.6
	Diesel	0.6
Commercial/Institutional	0.6	
Residential	0.6	
Agriculture/Forestry/Fishing	0.6	

Synergies between TNC and BUR

BUR

TNC

Challenges and solutions

Challenges	Solutions
Data availability and accessibility	<ul style="list-style-type: none"> - Assigned focal points - Established roles and communication processes - Identified already existing reporting schemes
Low interest level of stakeholders	<ul style="list-style-type: none"> - Created a momentum - Linked it to other sectoral plans
Lack of engagement of stakeholders	<ul style="list-style-type: none"> - Created a collective, dynamic and iterative process - Involved stakeholders on a consultation level - Established and nurtured a network of people
Difficulty in relying on expert judgment	<ul style="list-style-type: none"> - Building capacity of local expert in inventory preparation
Difficulty in institutionalizing inventory preparation of LULUCF	<ul style="list-style-type: none"> - no solution yet
Frequent changes in focal points	<ul style="list-style-type: none"> - no solution yet
Weak Central Administration of Statistics	<ul style="list-style-type: none"> - no solution yet

Contribution of LECB project

- LECB project created 2 processes that helped improve the GHG NIS:
 - × Minister's decision 99/1 dated 2013 on the necessity for all institutions to report their GHG emissions
 - Helping in building a bottom-up sectoral approach for energy related GHG emissions
 - × NAMA prioritization and development
 - Raising interest and sensitizing stakeholders on the importance of correct GHG emissions calculations



REPUBLIC OF LEBANON
MINISTRY OF ENVIRONMENT



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THANK YOU
