

מנהל המידע המרכזי
Central Bureau of Statistics
مديرية الإحصاء المركزية

Emissions Accounts of Air pollutions and Greenhouse Gases in Israel

Agriculture, Environment and Energy Sector
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Contents

- Air pollutants from fuel combustion
- Greenhouse Gases
- Distribution of emissions by sector
- Challenges
- progress Update:
 - ICBS Industry Survey comparison with PRTR
 - Input output tables
 - Existing information and missing information

Air Emissions by Sector

fuel combustion	{	Air pollution (from fuel combustion) <ul style="list-style-type: none">• Carbon monoxide (CO)• Sulfur dioxide (SO₂)• Nitrogen oxides (NO_x)• Hydrocarbons (HC)• Suspended particulate matter (SPM)• Lead (pb)
Industrial Processes		
Waste and Wastewater		
Agriculture		
Land Use and Forestation		Greenhouse Gases <ul style="list-style-type: none">• CO₂• CH₄• N₂O• As of 2008: HFC's, PFC's, SF₆• (Nox, CO, NMVOC, SO₂)

Air pollution (calculated by the ICBS)

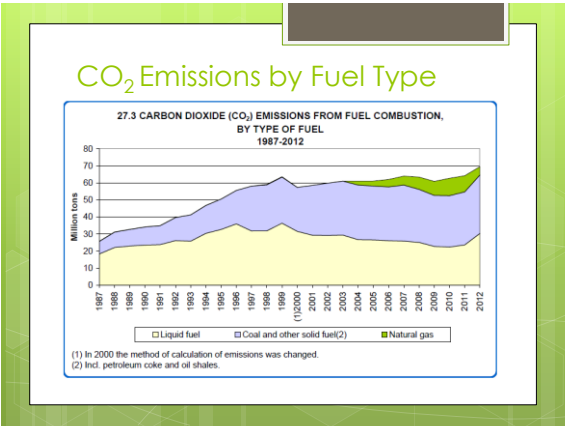
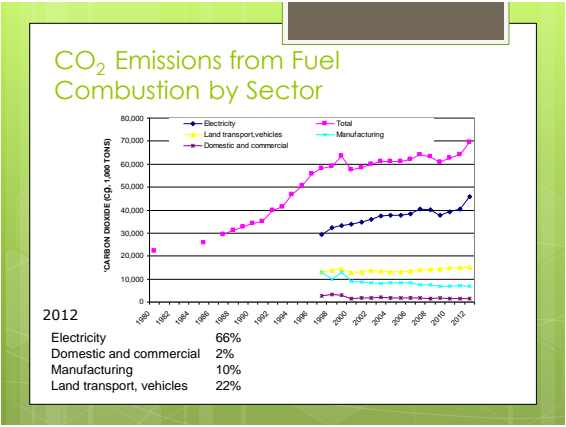
fuel combustion

Air pollution and CO₂

- Carbon dioxide (CO₂)
- Carbon monoxide (CO)
- Sulfur dioxide (SO₂)
- Nitrogen oxides (NO_x)
- Hydrocarbons (HC)
- Suspended particulate matter (SPM)
- Lead (pb)

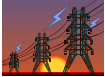
History:

- Time series Since 1980
- Methodology revised, 2000



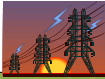
Methodology

- Total Fuel quantities received from the Fuel administration,
- Distribution:
 - Major Users - Electricity, Fuel Refining, Transport (partial)
 - Fuels Users - Natural gas, Coal, Naphtha, Oil shales



Methodology, cont.

- An ICBS Industry Survey 2010,2012 (ISIC rev. 3):
 - Dev C – Mining and quarrying
 - Dec D - Manufacturing
 - Dev E (40) - electricity
- Estimation of the Fuel Administration
- Estimation using the Input-Output Tables, 2006
 - Based on monetary values
 - Refers to 2006 only



Greenhouse Gases

Energy

Industrial Processes

Waste and Wastewater

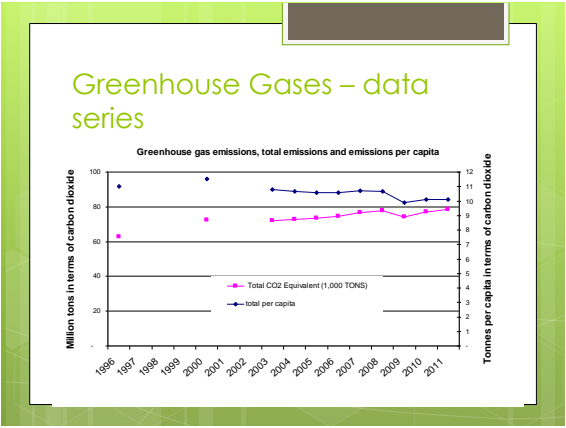
Agriculture

Land Use and Forestation

Greenhouse Gases

- CO₂
- CH₄
- N₂O
- As of 2008: HFC's,PFC's,SF6
- (Nox,CO,NMVOC, SO2)

- The 1996, 2000 GHG inventories were calculated by the MoEP
- From 2005 and on the CBS calculates the inventory annually (2003-2012 inventories)



Greenhouse Gases, key category analysis

IPCC Source Categories	2003	2004	2005	2006	2007	2008	2009	2010	2011	
Fuel combustion - Energy industries	54%	54%	54%	54%	54%	54%	54%	55%	55%	55%
Fuel combustion - Transport	25%	25%	25%	25%	25%	25%	25%	25%	25%	75%
Fuel combustion - Manufacturing industries and construction	8%	8%	8%	8%	8%	8%	7%	7%	7%	82%
Solid waste disposal on land	4%	4%	7%	7%	7%	7%	7%	7%	4%	89%
Industrial processes	4%	4%	4%	4%	4%	4%	4%	4%	4%	92%
Agriculture	3%	3%	3%	3%	3%	3%	3%	3%	3%	96%
Industrial processes - F-gases						2%	1%	2%	2%	98%
Waste-water handling	1%	1%	1%	1%	1%	1%	1%	1%	1%	99%
Fuel combustion - other	2%	2%	2%	2%	2%	2%	2%	2%	2%	101%
Land-use change and forestry	0%	0%	-1%	-1%	-1%	0%	0%	-1%	-1%	100%

- ### Challenges
- Fuel Consumption:
 - Only the distribution in the Manufacturing sector is Known
 - the other sectors distribution is unknown
 - Greenhouse Gases, distribution unknown:
 - F-gases (HFCs, PFCs)
 - waste & wastewater treatment
 - Other Emissions (not from fuel combustion)- need further development

progress Update

- Comparison of the data collected and reported to MoEP in the PRTR with the ICBS survey
- Examination of Input Output data
- Processing and analyzing the distribution of air emissions by sector, from the 2012 survey
- Update of the transport emissions model

ICBS Industry Survey Vs. PRTR (2012)

- In the PRTR – only partial reports from main sites of the company
- In the "ICBS Industry Survey" - some of the companies report together
- Differences in coverage
 - In the PRTR - 467 reports (377 companies)
 - Only 68 companies from the PRTR occurred in the ICBS Industry Survey

ICBS Industry Survey Vs. PRTR Energy consumption (2012)

status	Num of company's	%
Same data	16	24%
Similar	28	41%
Different	7	10%
Incomparable	13	19%
No data in the survey	4	6%
total	68	100%

ICBS Industry Survey Vs. PRTR Energy consumption (2012), cont.

- Differences in fuel categories
 - In the "ICBS Industry Survey" - there are two type of diesel oil: for transport and for industry and in the PRTR only one type is defined.
 - In the "ICBS Industry Survey" - light and heavy Residual fuel oil are separated and in the PRTR there is one category of Residual fuel oil

ICBS Industry Survey VS PRTR, waste (2012)

status	Num of company's	%
Same data	12	18%
Similar	11	16%
Different	27	40%
Incomparable	13	19%
No data in the survey	5	7%
total	68	100%

Conclusions from Study visit, Vienna - waste

- Understanding the need for an electronic reporting system for waste flows and treatment such as the **EDM - Electronic Data Management**. This system is primarily a tool for monitoring and supervision
- On the basis of the system - EDM preparing statistical estimates of the quantities of waste by industry and type of waste.
- Combining administrative/Statistics data with PRTR system in Austria is limited and can only be a source of supplementary information for review

Challenges using the Input-output table, 2006

- The Input output table is done by monetary unit and not by physical unit
- Since 2006 there are major changes in the energy sector due to the introduction of natural gas
- Differences in fuel categories:
 - diesel oil types
 - Residual fuel oil types

The Input output tables, 2006
Fuel Consumption, by Industry and Type of Fuel

ISIC Rev.3.1	Gasoline	LPG	Light and Heavy residual fuel oil	Diesel oil	Kerosene
A - Agriculture, hunting and forestry, B - Fishing	0.02%	8.00%	1.41%	6.85%	0.76%
D - Manufacturing, C - Mining and quarrying	1.99%	21.07%	55.99%	15.66%	-
E - (40) Electricity, gas, steam and hot water supply	0.00	-	12.30%	17.50%	-
E - (40) Collection, purification and distribution of water	0.01%	-	-	0.29%	-
F - Construction	0.10%	-	-	1.98%	-
G - Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	3.20%	0.01%	-	7.71%	-
H - Hotels and restaurants	0.04%	11.94%	-	0.41%	-
I - Transport, storage and communications	1.80%	-	29.54%	24.88%	74.78%
J - Financial intermediation	0.84%	-	-	0.31%	-
K - Real estate, renting and business activities	6.57%	0.00	-	9.52%	-
L - Public administration and defence; compulsory social security	1.96%	0.40%	0.77%	2.77%	15.74%
N - Health and social work	0.81%	2.06%	-	1.78%	-
M - Education, O - Other community, social and personal service activities	2.29%	0.00	-	2.14%	-
other	-	-	-	0.51%	-
private	81.84%	56.51%	-	13.31%	8.72%
	100.00%	100.00%	100.00%	100.00%	100.00%

The Input output tables, 2006
C - Mining and quarrying, D - Manufacturing,
Fuel Consumed, by Industry and Type of Fuel

ISIC Rev.3.1	Gasoline	LPG	Light and Heavy residual fuel oil	Diesel oil
10-13 Mining and quarrying	3.97%	0.00%	9.99%	11.88%
14-16 Food, beverages and tobacco products	16.36%	25.96%	4.50%	10.72%
17-18 Textiles and wearing apparel (except knitwear)	2.74%	5.30%	1.64%	1.67%
19 Footwear, leather and leather products	0.13%	0.00%	0.00%	0.11%
20 Wood and wood products (excl. furniture)	0.84%	0.09%	0.00%	0.73%
21 Paper and paper products	6.23%	0.04%	2.73%	4.14%
22 Publishing and printing	2.18%	1.80%	0.00%	2.11%
23 Refined petroleum and its products	0.00%	0.00%	70.99%	20.70%
24 Chemicals and chemical products	18.31%	25.09%	6.24%	16.44%
25 Plastic and rubber products	4.86%	4.49%	0.51%	2.81%
26 Non-metallic mineral products	12.95%	14.77%	2.82%	2.52%
27 Basic metal	2.10%	9.82%	0.39%	2.01%
28 Metal products	7.50%	7.49%	0.10%	6.09%
29-35 Machinery and electric equipment, transport equipment	17.99%	4.81%	0.04%	14.34%
36 Furniture	2.27%	0.77%	0.00%	2.93%
38-39 Jewellery, goldsmiths' and silversmiths' articles, manufacturing n.e.c.	1.16%	0.34%	0.05%	0.82%
	100%	100%	100%	100%

Existing information and missing information									
		coal	Naphtha	Natural gas	Residual fuel oil	Gas oil	LPG	Kerosene	Gasoline
House hold						FA, IO	FA, IO	FA, IO	FA, IO
Section A Agriculture, forestry and fishing					FA, IO	FA, IO	FA, IO	FA, IO	FA, IO
Section B Mining and quarrying				AD	SU	SU	SU	SU	SU
Section C Manufacturing			AD	AD	AD, SU	AD	AD	SU	SU
Section D Electricity, gas, steam and air conditioning supply	SD - Electric power generation, transmission and distribution	AD		AD	AD	AD			SU
Section H Transportation and storage, postal and courier activities	HS - Land transport					AD			FA, IO
	HS - Water transport					FA, IO			FA, IO
	HS - Air transport							AD	FA, IO
Other				AD	FA, IO	FA, IO	FA, IO	FA, IO	FA, IO
*Transport via railways is known									
AD - Administrative data	FA - Fuel Administration, MNAVIR								
IO - Industry Survey in the ICBS	IO - Input/Output Tables, 2008								

Existing information and missing information

		coal	Naphtha	Natural gas	light - Residual fuel oil	heavy - Residual fuel oil	Gas oil - Passenger car	Gas oil - Industry	LPG	Kerosene	Gasoline
House hold							IO	IO	IO	IO	IO
Section A Agriculture, forestry and fishing					IO		IO	IO	IO	IO	IO
Section B Mining and quarrying				AD	2,804	97,311	6,084	15,133	464	-	729
Section C Manufacturing			AD	AD	79,329	433,201	98,719	76,845	137,860	3,391	73,941
Section D Electricity, gas, steam and air conditioning supply	AD - Electric power generation, transmission and distribution	AD	AD	AD	115	1,020,818	9,440	1,332,000			1,969
Section H Transportation and storage, postal and courier activities	HS - Land transport						IO	IO			IO
	HS - Water transport						SD, SU	IO	SD, SU		IO
	HS - Air transport						IO	IO		1 014 909	IO
Other				AD	IO		IO	IO	IO	IO	IO
% known		100%	100%	100%	83%	89%	5%	99%	20%	97%	3%
AD - Administrative data	FA - Fuel Administration, MNAVIR										
SD - Industry Survey in the ICBS	IO - Input/Output Tables, 2008										

