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The mean temperature in Malta over the past 30 years was higher than the climatic norm of 18.6 degrees Celsius.

World Environment Day 2014

The theme chosen by the United Nations for this year's World Environment Day is "Small Island Developing States and Climate Change". Though Malta is not classified as a developing state, the effects of climate change are still likely to generate considerable environmental impacts on ecosystems, society and the economy in general.

Scientific evidence indicates that the increase in heat-trapping greenhouse gases from human activities is causing significant climatic changes worldwide. Table 1 shows that from 1990 to 2012, Malta's net emissions of greenhouse gases increased by 57.7 per cent. Throughout this time series, the energy sector contributed 91.2 per cent of total greenhouse gas emissions in Malta.

Table 2 shows data on emissions by source for the energy sector. The bulk of emissions in this sector originate from energy industries, which comprise the Marsa and Delimara power stations. From 1990 to 2012, emissions from the power stations constituted 66.7 per cent of emissions from all sectors presented in Table 1. Emissions from transport sources comprise the second largest source and amount to 18.6 per cent of national total emissions.

Data relating to the effects of climate change on Malta are presented in Tables 3 and 4. The mean temperature for 2004-2013 (19.3°C) was 0.8 degrees Celsius higher than the mean temperature recorded during 1974-1983 (18.5°C). Chart 3 also shows that from 1985 onwards, all years had a mean temperature which was higher than the climatic norm for Malta. Such data are further corroborated by Chart 4, showing an upward trend in the number of days when the maximum temperature exceeded the climatic norm.

Rainfall data presented in Table 4 differ from the trend shown by temperature. The total rainfall during 1974-2013 averaged 557.0 millimetres, slightly higher than the climatic norm of 553.4 millimetres. Chart 6 also shows that while rainfall intensity has varied from one year to another it has, on average, increased slightly. During 2004-2013, both rainfall intensity and variability of total rainfall from the climatic norm were the lowest in the past four decades ■

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Table 1. Greenhouse gas emission trends by sector

CO₂ equivalence ('000 tonnes)

Year	Greenhouse gas emissions					Withdrawals	Net greenhouse gas emissions
	Energy	Industrial processes	Solvent and other product use	Agriculture	Waste	Land use, land use change and forestry	
1990	1,878.10	1.58	2.48	71.83	37.84	-5.21	1,986.63
1991	2,054.36	1.78	2.48	79.29	39.88	-6.76	2,171.05
1992	2,159.82	2.90	2.48	90.05	42.08	-6.76	2,290.58
1993	2,156.12	2.94	2.48	100.33	46.04	-6.76	2,301.15
1994	2,267.74	3.24	2.48	109.52	50.51	-6.76	2,426.73
1995	2,226.04	3.21	2.48	133.75	52.81	-6.76	2,411.55
1996	2,278.68	3.04	2.48	126.90	53.49	-6.76	2,457.84
1997	2,268.69	77.11	2.48	138.38	55.34	-6.76	2,535.25
1998	2,272.74	76.54	2.48	108.70	60.25	-6.76	2,513.95
1999	2,363.35	75.80	2.72	109.66	60.62	-6.76	2,605.39
2000	2,360.56	10.11	3.01	112.93	64.40	-6.76	2,544.25
2001	2,480.70	17.27	2.33	107.41	66.84	-6.76	2,667.79
2002	2,500.77	30.53	2.56	106.41	68.29	-6.82	2,701.74
2003	2,680.35	42.29	2.38	99.34	71.88	-6.87	2,889.36
2004	2,634.63	62.24	2.37	104.10	74.86	-6.93	2,871.27
2005	2,722.43	66.34	2.26	102.64	83.76	-6.98	2,970.44
2006	2,689.09	89.37	2.03	103.21	94.76	-7.04	2,971.41
2007	2,775.93	107.94	2.71	104.06	100.78	-7.10	3,084.31
2008	2,734.83	118.55	2.10	95.42	105.77	-7.15	3,049.52
2009	2,661.43	121.81	1.60	90.68	117.64	-7.21	2,985.95
2010	2,654.41	123.12	1.29	86.92	128.73	-7.27	2,987.20
2011	2,682.66	136.57	1.31	79.70	126.76	-7.32	3,019.68
2012	2,821.91	171.83	1.90	79.44	65.07	-7.22	3,132.94

Source: Malta Resources Authority: National Greenhouse Gas Emissions and Removals Inventory Report - April 2014.

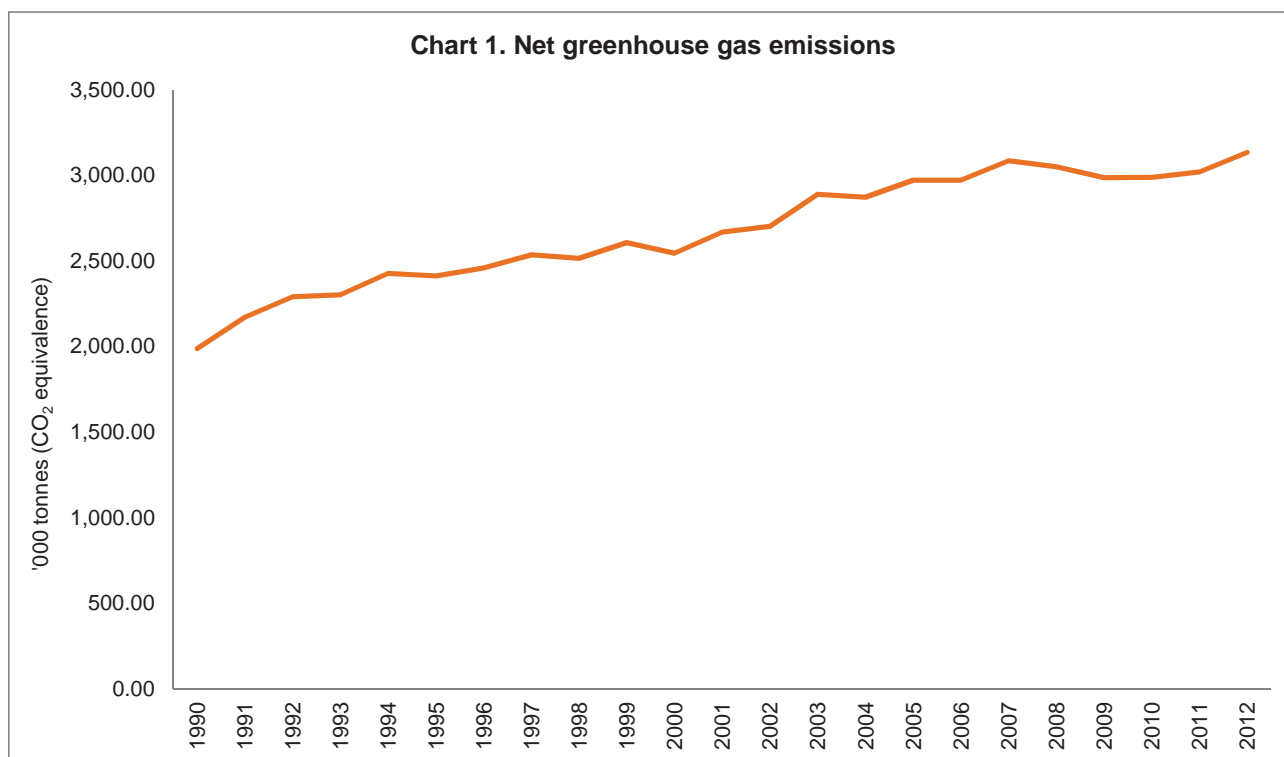


Table 2. Breakdown of sources for emissions in the energy sector

Year	Energy industries	Manufacturing industries and construction	Transport	Commercial / institutional	Residential	CO ₂ equivalence ('000 tonnes)	
						Agriculture / forestry / fisheries	Total
1990	1,372.62	59.46	349.50	61.89	34.63	:	1,878.10
1991	1,517.66	62.63	369.94	65.23	38.91	:	2,054.36
1992	1,602.69	59.16	394.74	62.21	41.00	:	2,159.82
1993	1,578.02	58.35	416.11	61.85	41.79	:	2,156.12
1994	1,675.08	57.62	433.23	61.23	40.57	:	2,267.74
1995	1,611.20	60.16	446.46	67.55	40.68	:	2,226.04
1996	1,638.35	62.67	469.51	66.86	41.30	:	2,278.68
1997	1,630.50	57.51	481.00	59.14	40.54	:	2,268.69
1998	1,645.10	41.39	488.38	58.61	39.26	:	2,272.74
1999	1,708.60	54.65	497.25	62.27	40.59	:	2,363.35
2000	1,693.30	57.52	504.00	65.75	39.98	:	2,360.56
2001	1,814.22	49.40	527.97	50.66	38.44	:	2,480.70
2002	1,830.34	46.80	532.57	46.50	38.88	5.68	2,500.77
2003	2,006.84	48.16	533.92	47.62	41.45	2.36	2,680.35
2004	1,957.47	59.31	510.48	59.65	42.24	5.48	2,634.63
2005	1,995.85	51.08	566.46	55.27	46.61	7.16	2,722.43
2006	2,010.67	46.01	532.12	50.96	41.72	7.61	2,689.09
2007	2,052.96	51.48	561.98	60.76	39.58	9.16	2,775.93
2008	2,009.83	47.74	560.27	66.03	41.77	9.18	2,734.83
2009	1,917.31	40.55	574.40	72.26	46.02	10.88	2,661.43
2010	1,893.57	46.19	590.74	71.18	40.80	11.92	2,654.41
2011	1,937.73	73.00	566.76	50.57	49.19	5.42	2,682.66
2012	2,057.08	73.23	551.19	67.52	49.98	22.92	2,821.91

Source: Malta Resources Authority: National Greenhouse Gas Emissions and Removals Inventory Report - April 2014.

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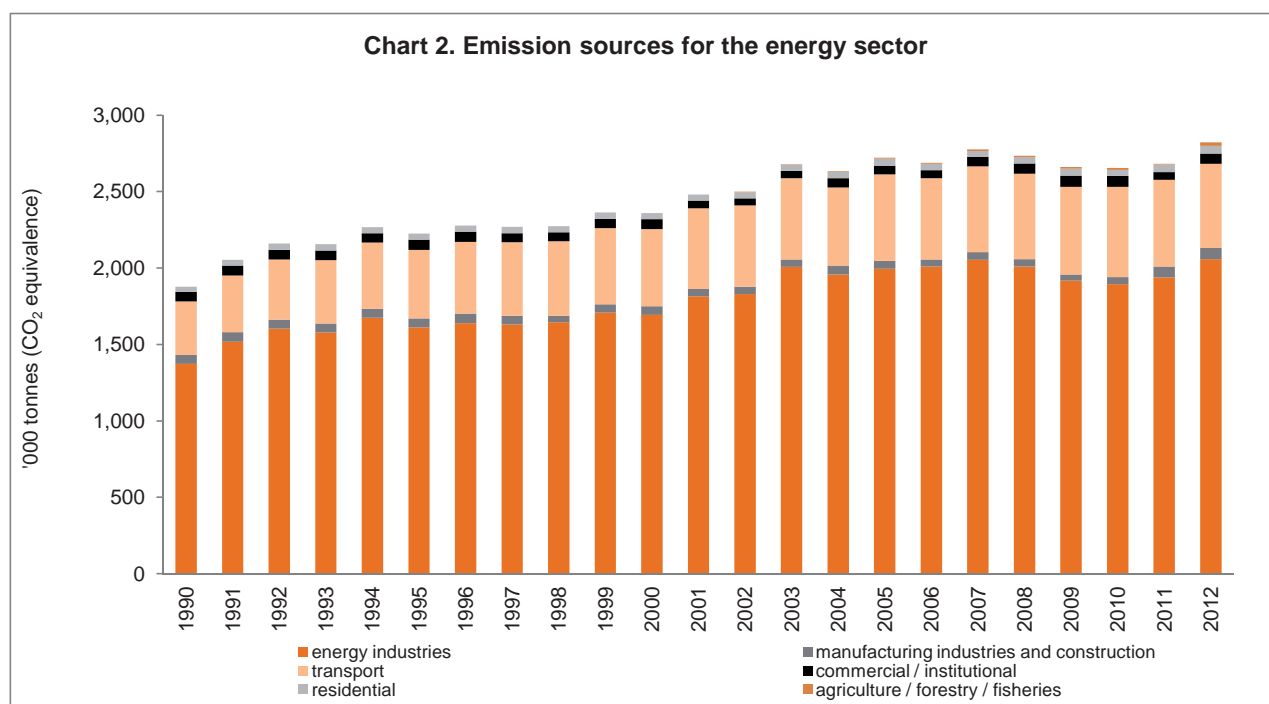


Table 3. Annual mean temperature for Malta

Year	Mean temperature / °C	Number of days with maximum temperature exceeding 1961-1990 average
1974	18.4	178
1975	18.4	180
1976	17.9	117
1977	18.9	212
1978	18.2	142
1979	18.7	182
1980	18.0	146
1981	18.4	196
1982	19.0	213
1983	18.7	200
1984	18.3	191
1985	19.0	218
1986	18.8	202
1987	19.2	219
1988	19.4	231
1989	18.9	197
1990	19.7	240
1991	18.8	183
1992	19.1	210
1993	19.2	216
1994	19.8	264
1995	19.2	233
1996	19.2	202
1997	19.4	243
1998	19.5	251
1999	19.9	279
2000	19.5	247
2001	19.9	254
2002	19.4	188
2003	19.5	215
2004	18.9	171
2005	18.7	154
2006	19.3	197
2007	19.7	231
2008	19.7	209
2009	19.1	187
2010	19.3	192
2011	18.9	192
2012	19.6	233
2013	19.7	247
Average 1974-2013	19.1	207
Climatic norm (average 1961-1990)	18.6	-

Source: Malta International Airport Meteorological Office.

Chart 3. Average annual temperature

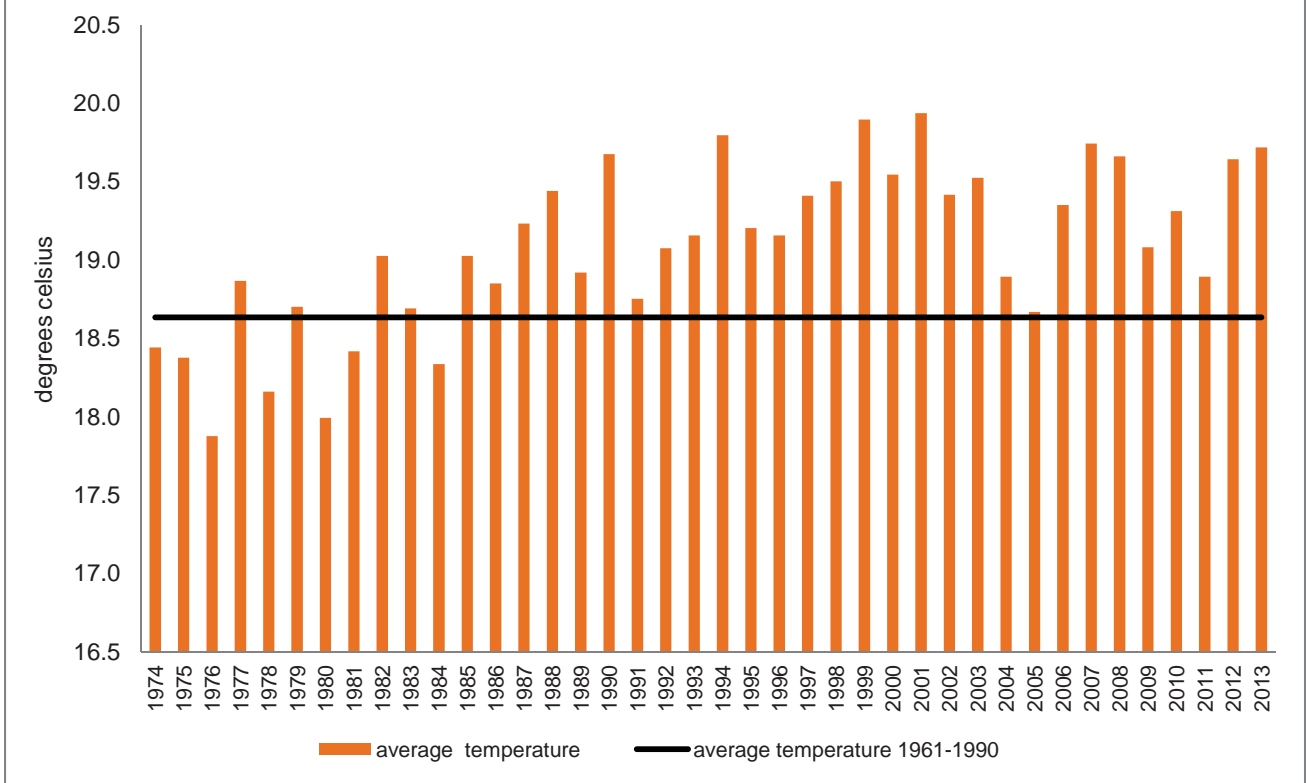


Chart 4. Number of days with maximum temperature exceeding the climatic norm

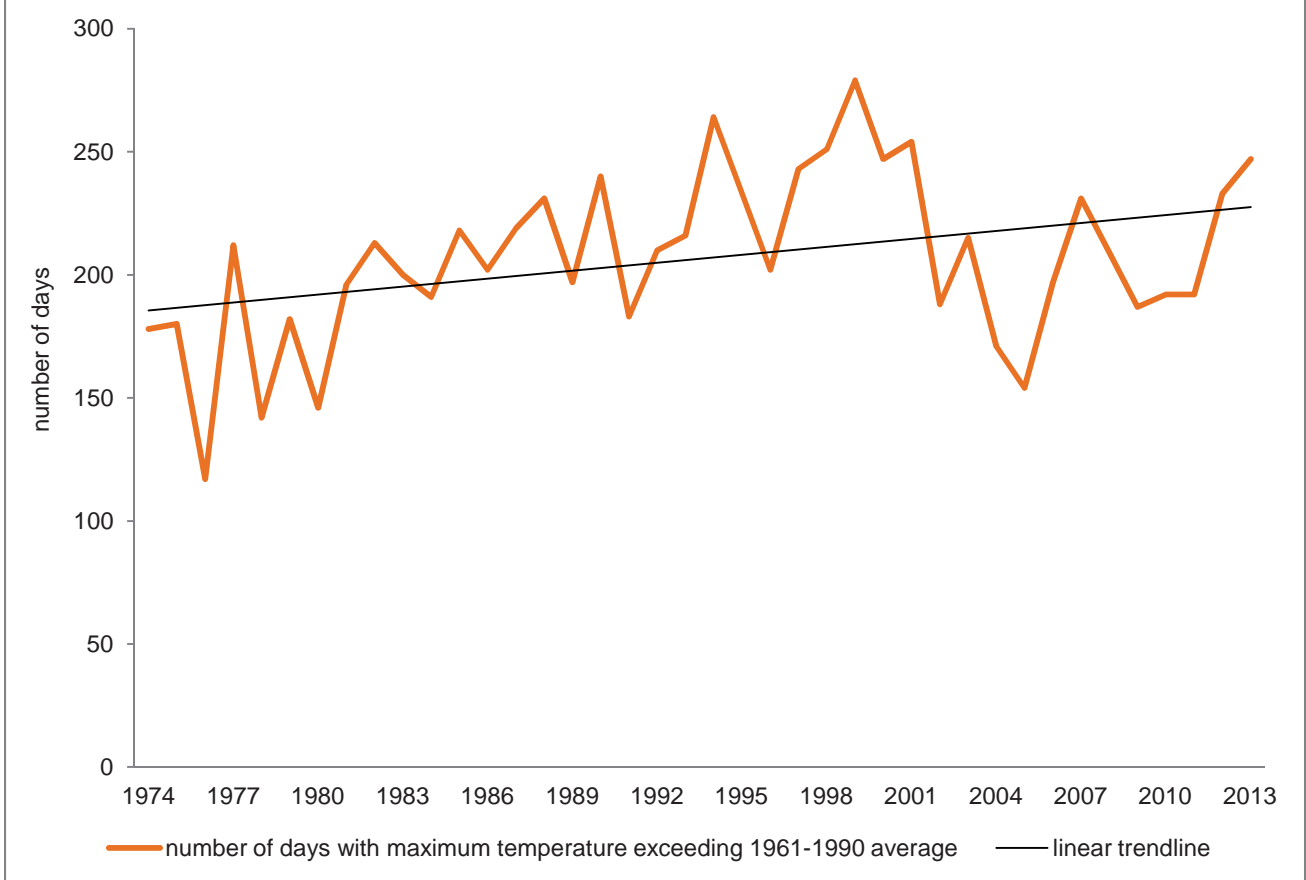


Table 4. Rainfall in Malta

Year	Total rainfall/mm	Number of days having over 1.0 mm of rain
1974	304.3	52
1975	562.6	73
1976	874.1	87
1977	381.3	39
1978	424.0	59
1979	670.7	64
1980	459.7	58
1981	334.0	42
1982	769.5	77
1983	701.7	46
1984	474.1	61
1985	433.8	50
1986	737.6	77
1987	361.6	56
1988	657.7	63
1989	518.4	52
1990	602.9	70
1991	554.0	54
1992	490.7	47
1993	473.0	52
1994	662.6	52
1995	696.0	63
1996	623.5	69
1997	894.5	75
1998	343.5	45
1999	718.7	59
2000	451.7	50
2001	338.2	54
2002	454.1	53
2003	900.6	68
2004	461.5	58
2005	505.7	52
2006	540.0	55
2007	620.4	63
2008	500.6	60
2009	680.4	66
2010	513.1	59
2011	591.0	69
2012	519.2	72
2013	479.6	61
Average 1974-2013	557.0	60
Climatic norm (average 1961-1990)	553.4	-

Source: Malta International Airport Meteorological Office.

Chart 5. Total rainfall

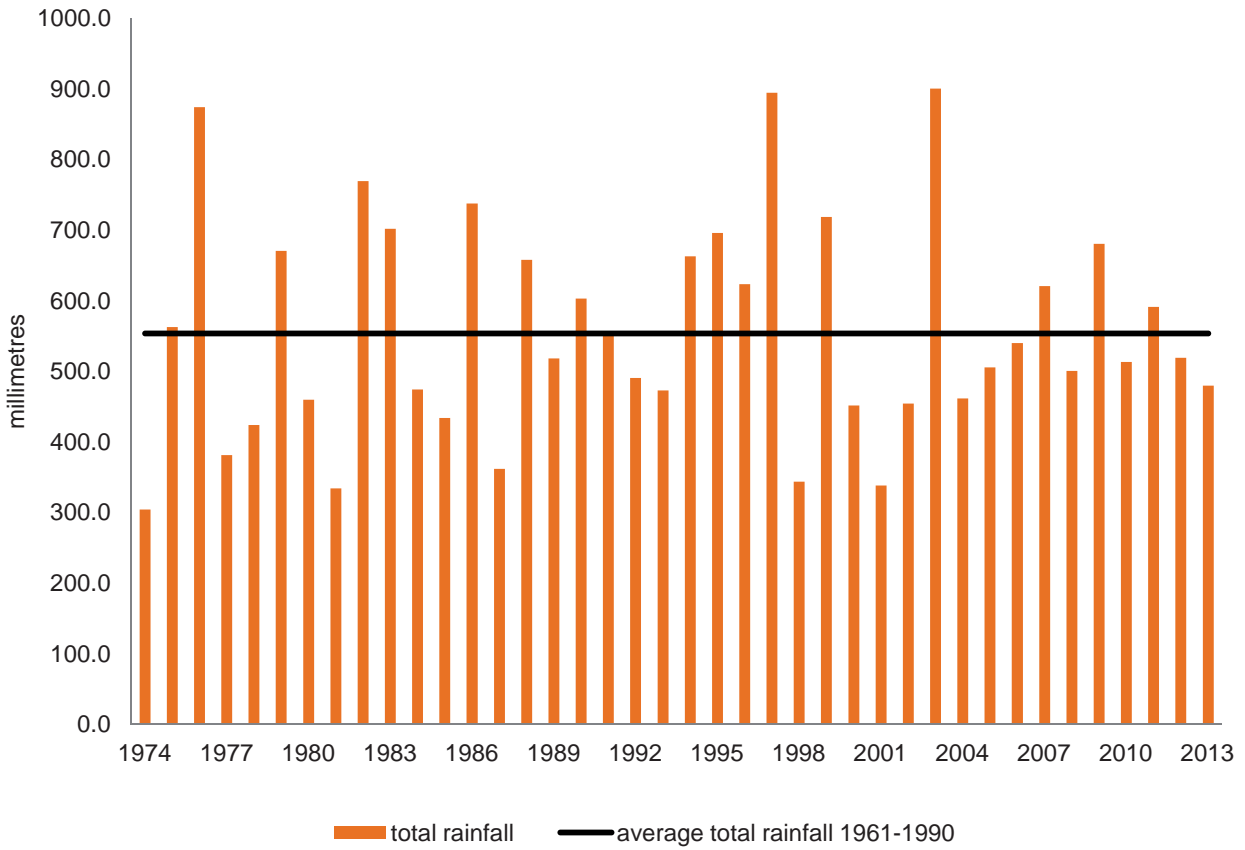
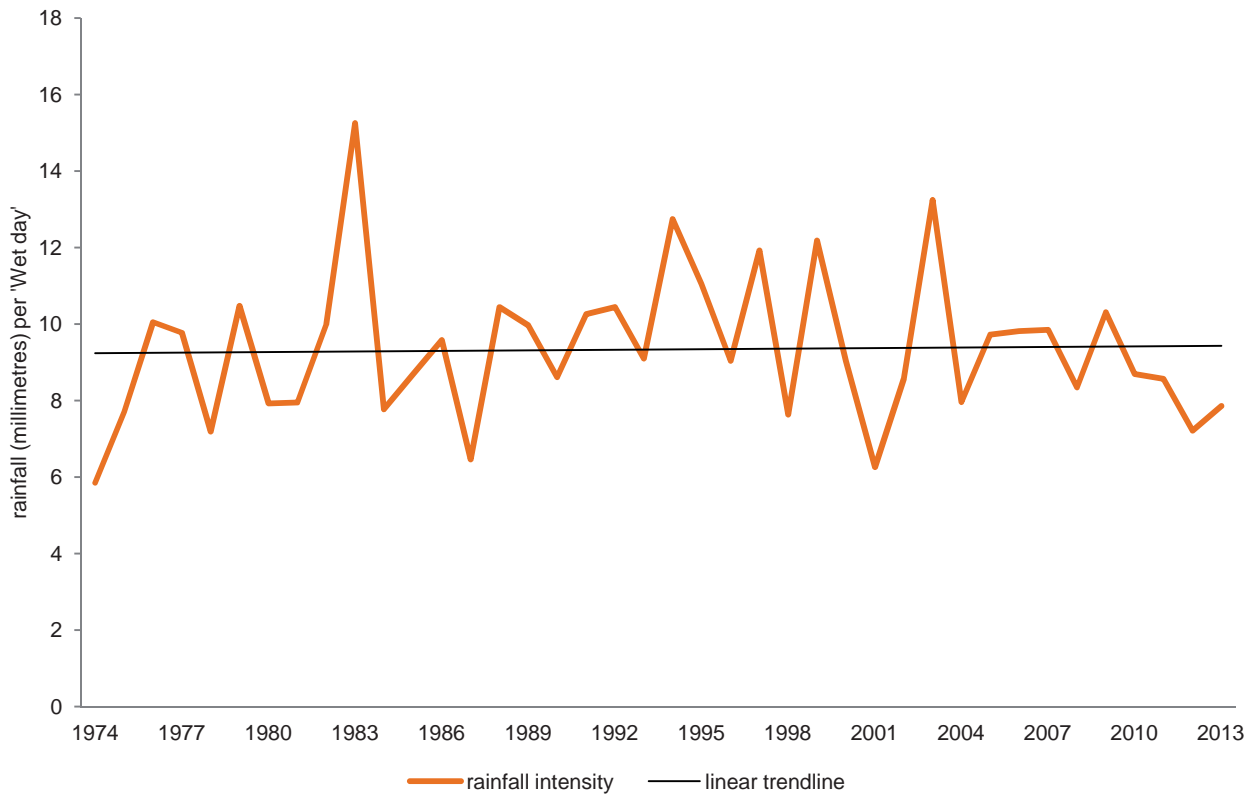


Chart 6. Rainfall intensity



Methodological Notes

1. Climatic changes experienced in Malta are the result of global trends and cannot be directly linked to Malta's emissions of greenhouse gases.
2. Data about greenhouse gas emissions are extracted from the National Greenhouse Gas Emissions and Removals Inventory Report, compiled by the Malta Resources Authority for the United Nations Framework Convention on Climate Change, as submitted in April 2014. The report covers the period 1990-2012.
3. Data about rainfall and temperature are provided by the Meteorological Office of the Malta International Airport. Trends in climatological data are observed on a lengthy time scale and so the temperature and rainfall data in Tables 3 and 4 cover the 40-year period from 1974 to 2013.
4. The National Greenhouse Gas Emissions and Removals Inventory Report aggregates sources of emissions into five sectors:
 - a. The energy sector refers to fuel combustion which takes place in energy production, transport, households and economic units.
 - b. The industrial processes sector comprises direct and indirect emissions which arise as by-products of industrial processes.
 - c. The solvent and other product use sector includes emissions from the use of Nitrous Oxide for anaesthetic use and Non-Methane Volatile Organic Compounds (NMVOC) emissions from the use of solvents and solvent-containing products.
 - d. The agriculture sector includes emissions from enteric fermentation, manure management and from soils which are used for agricultural purposes.
 - e. The waste sector includes solid waste disposal, wastewater handling, waste incineration and compost production.Greenhouse gas withdrawals are accounted for in the land use, land use change and forestry sector. Withdrawal of greenhouse gases in this sector depend on the land cover of different vegetation types.
5. The 1961-1990 averages used for rainfall and temperature data refer to Malta's official climate "normals" as prescribed by the World Meteorological Organisation. Climate "normals" can be defined as long-term reference values of climatological variables.
6. Definitions for meteorological data:
 - a. Mean temperature - The average of the maximum and minimum temperature over specified time periods.
 - b. Total rainfall - The total amount of liquid precipitation over a specified time period.
 - c. Wet days - Days having a total rainfall amount exceeding 1.0 millimetre.
 - d. Rainfall intensity - Total rainfall divided by the number of wet days.