

THE ENVIRONMENT REPORT INDICATORS 2009



Malta Environment & Planning Authority



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THE ENVIRONMENT REPORT INDICATORS 2009



TRACKING THE ENVIRONMENT

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INTRODUCTION

Welcome to The Environment Indicators 2009, which help us keep track of progress and trends in the state of the Maltese environment. With this publication, which is the 5th annual publication of its kind, we are once again aiming to provide easy access to environmental information to policy-makers, organisations and the general public. This booklet complements the state of the environment report, which is published every 3 years. Updating the latest Environment Report published in 2010, which reflected the situation in 2008, the data in this booklet covers 2009, or provides the latest available data if it is earlier than 2009.

As in previous editions, each indicator is accompanied by a smiley 😊, neutral 😐 or sad 😞 face, to help readers to track progress with regards to particular environmental indicators.

It is important to note, however, that the award of a smiley (or not) depends on two criteria: the overall dimension of the environmental problem as well as the trend. This means that an indicator is awarded a smiley if the overall situation, as well as the recent trend, are both positive. On the other hand, if there is a small positive trend but the overall trend remains a matter of concern, the indicator is not awarded a smiley.

This booklet of environmental indicators is published by the Malta Environment and Planning Authority in partnership with the National Statistics Office, and draws on datasets from across the Maltese government and other organisations. This publication, together with datasets and maps, can be downloaded from the MEPA website (www.mepa.org.mt/ter).



KEY FACTS

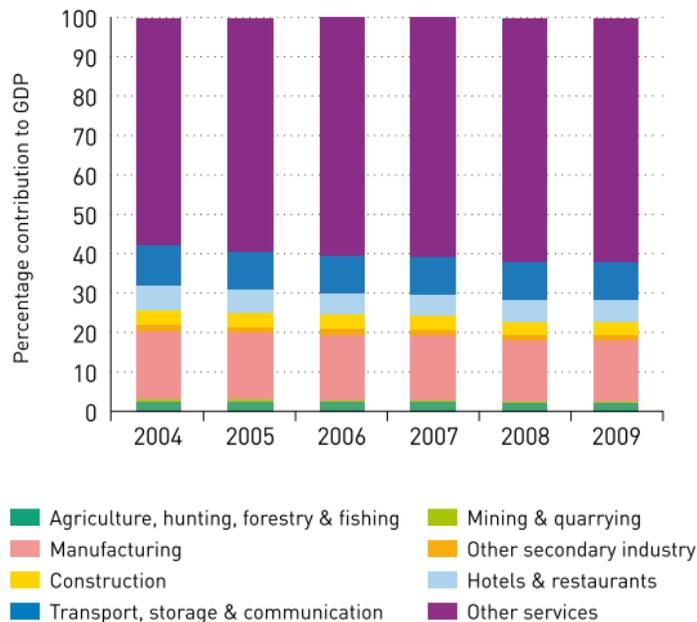
DRIVING FORCES FOR ENVIRONMENTAL CHANGE

- Planning permissions granted for dwellings fell by 22.5% in 2009, to 5,298 dwelling units permitted.
- The number of private motor vehicles registered in the Islands increased by 1.9% to 300,347 in 2009, which is slightly slower than the 2.6% growth rate of the previous year.
- Electricity generated fell by almost 5% in 2009.

DF1 SECTORAL CONTRIBUTIONS TO GDP

☹️ **Key policy question:** Are sectoral contributions to GDP moving in environmentally-friendly directions?

The trend that the Maltese economy is becoming increasingly dominated by the services sector continued in 2009. In that year, the services sector made up 78.3% of economic activity, 1.5% more than in 2008. This trend may indicate a transition to a cleaner economy, however a service-oriented economy depends strongly on the performance of the sectors and operators included within them, although this assumption requires more detailed analysis. The productive sector, which includes agriculture and fisheries, increased slightly by 0.2%, principally through a 0.2% increase in the agriculture sector. Mining and quarrying remained stable at 0.3% of gross domestic product (GDP) in 2009, indicating continued resource depletion. At the same time, the share of manufacturing fell by 2.3% to 13.3% in 2009. The share of other secondary industry (electricity, gas and water supply) increased by 0.8%. During the same period construction decreased slightly by 0.4% to 3.9% of total GDP. Construction may be negatively correlated with environmental quality. Business activities including real estate and renting contributed to 17.7% of GDP in 2009, registering a slight increase in share (1.3%) since 2008. On the other hand, the share of transport, storage and communication decreased by 0.7% to 9.2% in 2009. Transport activity has a major environmental impact, for example through air pollution. The share of hotels and restaurants continued to decrease slightly, down by 0.6% since 2008.

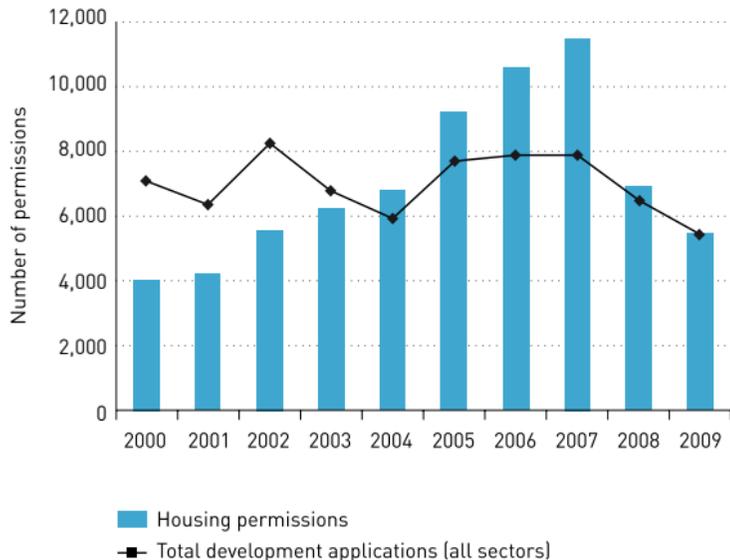


Source: NSO 2011a

DF2 HOUSING PERMISSIONS

☹️ **Key policy question:** What is the trend in permissions for housing development?

Between 2008 and 2009 the number of permissions issued for new dwellings declined by 22.5%, from 6,836 permitted in 2008 to 5,298 in 2009. A 15% decrease in the total number of applications was also registered during the same period. While 87% of all dwelling permissions granted were for apartments, this period saw a fall of 3.3% in permissions for this type of dwelling relative to other dwelling types, for the first time since 2000. The share of apartment permissions of total had increased from 64% to 90% between 2000 and 2008. The share of permissions for maisonettes and terraced houses registered a slight increase during the same period, while that of bungalows, farmhouses, semi-detached houses and villas continued to decrease. In 2009, the share of housing permissions located outside the development zone increased to 3.9% (a total of 204 units) of total permissions granted. This represented an increase of 8 dwelling units over the average number of dwelling permissions granted outside the development zone between 2000 and 2008 (196 units). In addition, 55.5% of housing permissions were on undeveloped land, up from 50.8% in 2008, but still much less than the 70% registered in 2000.

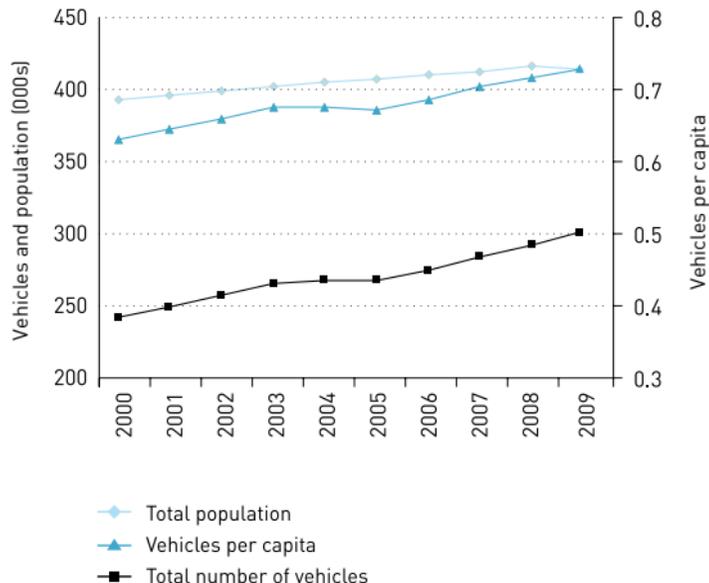


Source: MEPA Dwellings Database

DF3 VEHICLE FLEET PER CAPITA

 **Key policy question:** Is vehicle ownership on the rise?

Land transport in Malta is principally dependent on privately-owned vehicles. The large number of vehicles relative to the population has a negative impact on human and ecosystem health, as well as land take-up, congestion and urban quality, thus also impacting the economy. In 2009 registered private motor vehicles totalled 300,347, increasing by 1.9% over 2008, this being the lowest growth rate since 2006. In 2009 vehicles per capita stood at 0.73, increasing slightly from 0.71 in 2008, due to a decrease in total population. In 2009, 64% [18,717] of imported vehicles were second-hand, 52% more than in 2008. The increasing number of imported second-hand vehicles is of particular concern since second-hand vehicles in the European Union (EU) are not required to have the same emission standards as new vehicles. As of 2011, the average age of the national vehicle stock is between 13 and 14 years old.¹ The number of registered electric motor vehicles increased again by 3, totalling 33 in 2009, while there were 5 electric motorcycles.



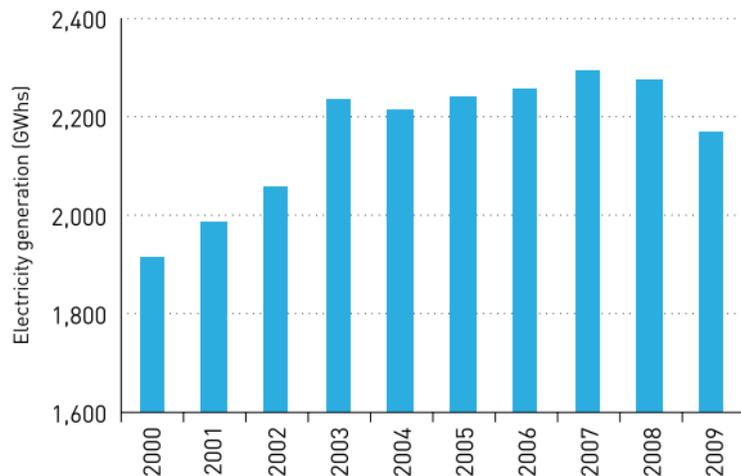
Note: In the fourth quarter of 2005, the stock of motor vehicles was re-assessed in view of an improvement in the computation of cars that had been scrapped in past years.

Source: NSO, Transport Malta

DF4 ELECTRICITY GENERATION

😊 **Key policy question:** What is the trend in electricity generation?

Electricity generation is a major source of airborne pollutants, contributing also to climate change. In 2009 75% of fuel utilised in Malta went to power generation.² Between 2008 and 2009 electricity generated fell by almost 5% to 2,168 gigawatt hours (GWhrs), marking the largest drop in the last decade. This may be due to various factors, including cost of electricity, the economic climate, and the use of renewable energy technologies and investment in energy conservation. Government is currently investing in the extension of the Delimara Power Station, which should be operational in 2012, and will result in increased efficiency. In addition, by 2013 the interconnector to the European Energy Grid should be in place, and this will raise conversion energy efficiency to an average 40%. These measures will enable the closure of the Marsa power station. With a view to meeting the requirements of the Renewable Energy Policy, Malta should reach 10% renewable energy share in gross energy consumption. This target is complemented with others relating to energy savings and greenhouse gas emissions.³ These investments should contribute to improved air quality over the next few years.

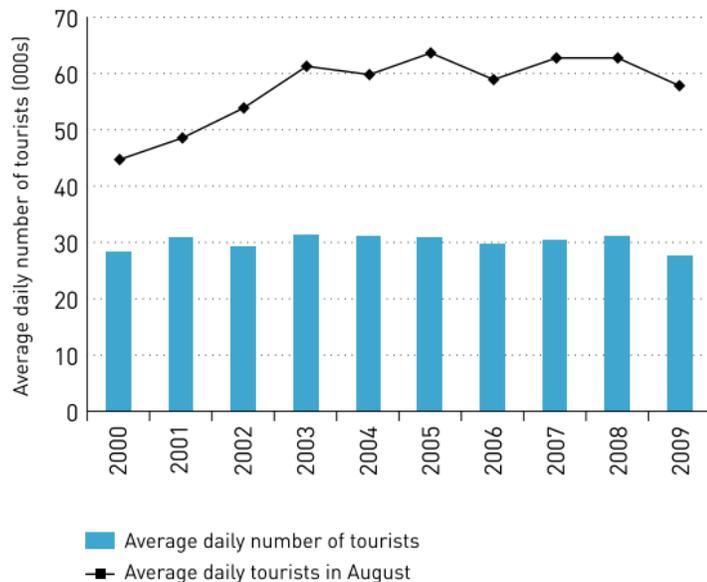


Source: NSO

DF5 DAILY NUMBER OF TOURISTS

☹️ **Key policy question:** Is pressure from tourism on the environment increasing?

Tourism is an important sector of the Maltese economy, however it has significant impact on the environment in terms of waste generation, electricity and water consumption, land take-up and pressure on ecologically-sensitive areas. Between 2008 and 2009 tourist numbers decreased by 8.4% to 1.18 million in 2009, and total bed-nights fell by 9.2% during the same period. Between 2008 and 2009, the number of departing tourists in August fell by 3% to 172,438, but achieving an even distribution throughout the year, and therefore alleviating pressures on environmental resources, remains a challenge for the Maltese tourism sector. Foreign students attending English-language specialised schools decreased by 17.3% between 2008 and 2009, falling from 83,288 to 68,918. These students represented 5.8% of total tourists in 2009 (down from 6.5% in 2008), and most of them (57.8%) visited in summer.⁴ Cruise-liner calls declined by 34.3%, from 397 in 2008 to 261 in 2009, and passengers decreased by 20.9%.⁵ However in 2010, tourist numbers once again revived, increasing by 13% over 2009, and exceeding the 2008 total.⁶



Source: NSO



KEY FACTS

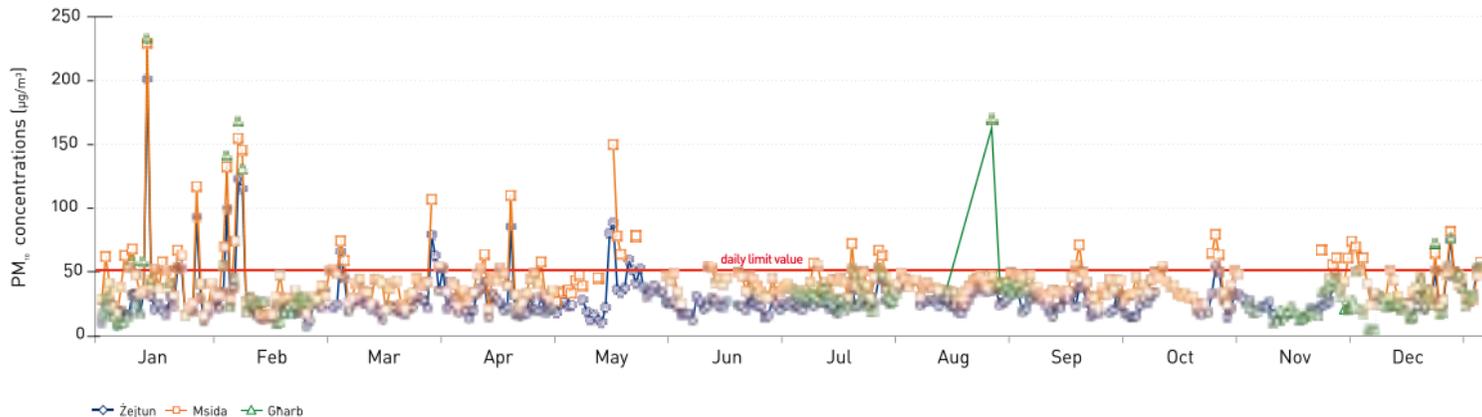
AIR

- Malta experienced high levels of PM_{10} in 2009. However, many of the exceedances of the daily limit value were due to natural sources, which can be deducted, and this results in the county being compliant.
- Annual average ozone concentrations increased slightly by 1.3% in 2009. The hourly information threshold was exceeded in Għarb, but not in Kordin and Żejtun.
- The annual average benzene concentration remained almost constant between 2008 and 2009, and no locality average exceeded the EU limit value.
- The annual nationwide average of nitrogen dioxide concentrations remained well below the EU and WHO limit values in 2009, however concentrations exceeded the limit value in 5 localities and 22 individual sites.
- National annual average sulphur dioxide concentrations fell by 20% in 2009, in line with trends over the past years.

A1 PARTICULATE MATTER CONCENTRATIONS

☹️ **Key policy question:** Do particulate matter concentrations meet EU air quality standards?

PM₁₀ concentrations in 2009



Source: MEPA

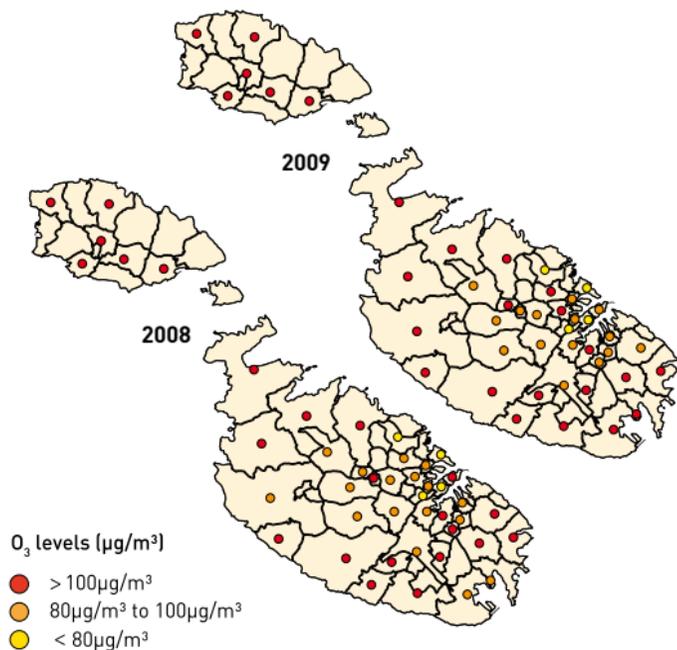
Particulate matter (PM) consists of very small suspended solid or liquid particles, deriving mainly from fuel combustion in transport and power generation,⁷ quarrying and construction dust, mechanically-generated dust, tyre and brake abrasion, and aerosols of transboundary origin, but it also includes natural sources such as atmospheric sea salt and wind blown dust (both local and transported e.g. from the Sahara). High levels of PM are associated with general ill health, decrease in lung function, asthma or even mortality.⁸ In 2009 Malta's real-time monitoring stations indicated high levels of PM₁₀,⁹ although they are partly from natural sources. The European Union (EU) daily limit value of 50µg/m³, which should not be exceeded more than 35 times a year (approximately 10% of days measured), was exceeded on 57 out of 313 days measured (18.2% of days measured) at Msida, the site most dominated by traffic. The urban site in Żejtun recorded exceedances on 22 or 6.9% of the days measured. At Gharb the threshold was exceeded on 10% of days measured (14 out of 133 days), and the highest concentration

for 2009, of 233.5µg/m³, was recorded in this locality. Following analysis at Żejtun, it emerged that nearly all the exceedances at this station were due to natural sources. This enabled a revision of the Msida exceedances, whereby days with common exceedances due to natural sources at both sites were deducted, hence leaving Msida with 35 exceedances. There were more exceedances in 2009 than in 2008 due to improved data capture. In 2008, Msida had registered exceedances on 51 days or 24% of days measured, Gharb and Żejtun at 7% on days measured, and Kordin at 5% of days measured. If 2008 exceedances due to natural sources were deducted, Msida exceedances would have amounted to 31 days or 13% of days measured in that year. With regards to PM_{2.5}, the highest value was recorded at Msida at 22.5µg/m³, increasing by 5.6% between 2008 and 2009, while during the same period at Gharb there was a 32.4% increase in PM_{2.5}, up to 18µg/m³. The EU annual average limit value for PM_{2.5} is 25µg/m³, to be attained by 2015.

A2 OZONE CONCENTRATIONS

☹️ **Key policy question:** Do ozone concentrations in Malta meet EU air quality standards?

Ozone (O_3) is formed when nitrogen oxides and volatile organic compounds react in sunlight, and it is a harmful pollutant at ground level since it impairs respiratory systems,¹⁰ and reduces crop yields.¹¹ The main O_3 precursors¹² emerge from primary traffic and power generation emissions,¹³ however the majority of O_3 affecting Malta is of transboundary origin.¹⁴ EU standards set the following limit values for O_3 , which require real-time monitoring: $120\mu\text{g}/\text{m}^3$ 8-hourly running average value for human health protection, not to be exceeded more than 25 times per year (6.8% percent of days measured); and also $180\mu\text{g}/\text{m}^3$ hourly information threshold for human health protection.¹⁵ In 2009, the 8-hour limit value was exceeded on 25 or 8% of days measured in Għarb, while exceedances were recorded on 2 or 0.6% of days measured in Kordin and on 9 or 2.6% of days measured in Żejtun. No exceedances were recorded in Msida. The $180\mu\text{g}/\text{m}^3$ information threshold should never be exceeded



Source: MEPA



but concentrations were higher for 2 hours at the Gharb monitoring station. Although EU limit values have not been set for annual average O_3 concentrations, national annual average O_3 concentrations slightly increased by 1.3% from $101.1\mu\text{g}/\text{m}^3$ to $102.5\mu\text{g}/\text{m}^3$ between 2008 and 2009. As in previous years, the highest O_3 concentrations were recorded in rural localities less affected by traffic, with Gharb in Gozo again registering the highest annual average concentration [$135.3\mu\text{g}/\text{m}^3$].¹⁶ With respect to individual sites, readings from the

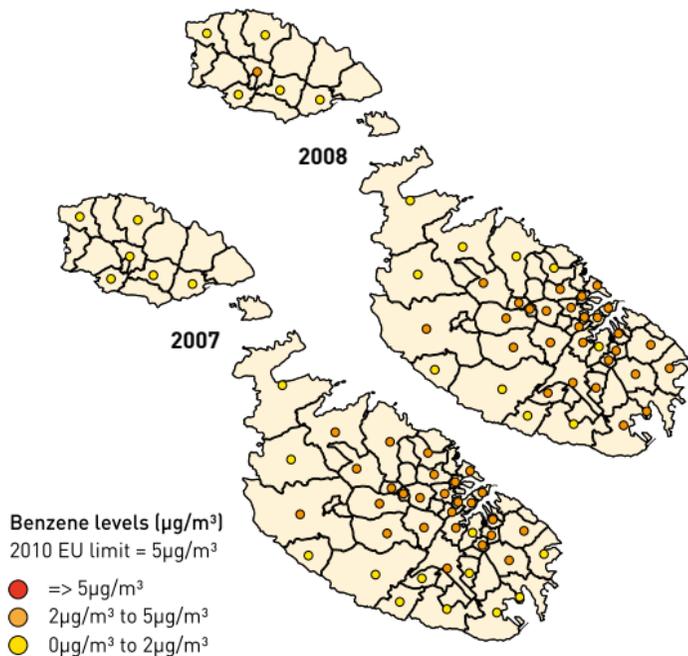
Gharb monitoring station registered the highest annual average O_3 concentration ($154.3\mu\text{g}/\text{m}^3$) in 2009. The number of sites with an annual average concentration exceeding $100\mu\text{g}/\text{m}^3$ increased from 69 out of 133 in 2008 to 75 out of 131 sites in 2009.

A3 CONCENTRATIONS OF BENZENE AND OTHER VOLATILE ORGANIC COMPOUNDS

😊 **Key policy question:** Do concentrations of benzene and other volatile organic compounds meet EU air quality standards?

Volatile Organic Compounds (VOCs) are airborne compounds generated through combustion,¹⁷ but also by many products containing solvents such as paints, varnishes, cleansers, disinfectants and automotive products.¹⁸ These compounds cause respiratory irritations and other genetic and nervous disorders, depending on various factors such as length of exposure. VOCs are also O₃ precursors.¹⁹ MEPA monitors the VOCs known as Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) with diffusion tubes, as well as real-time at Msida, Żejtun and Għarb. Benzene becomes a pollutant in air when it is released through the distribution of petrol or its incomplete combustion. Benzene is mutagenic²⁰ and carcinogenic and is considered to be harmful in any dose.²¹ Average annual atmospheric concentrations of benzene remained almost constant in 2008, increasing slightly from 2.2µg/m³ to 2.3µg/m³ respectively. Benzene levels increased in the majority of localities, with the greatest increase recorded in Birżebbuġa [60% between 2007 and 2008], however, similar to previous years, in 2008 no locality average exceeded the EU limit value of 5µg/m³ (not to be exceeded by 2010). The lowest benzene concentration, of 1.2µg/m³, was recorded again in Marsalforn.

Note: 2009 data is not available due to technical faults related to overexposure of samples.



Source: MEPA



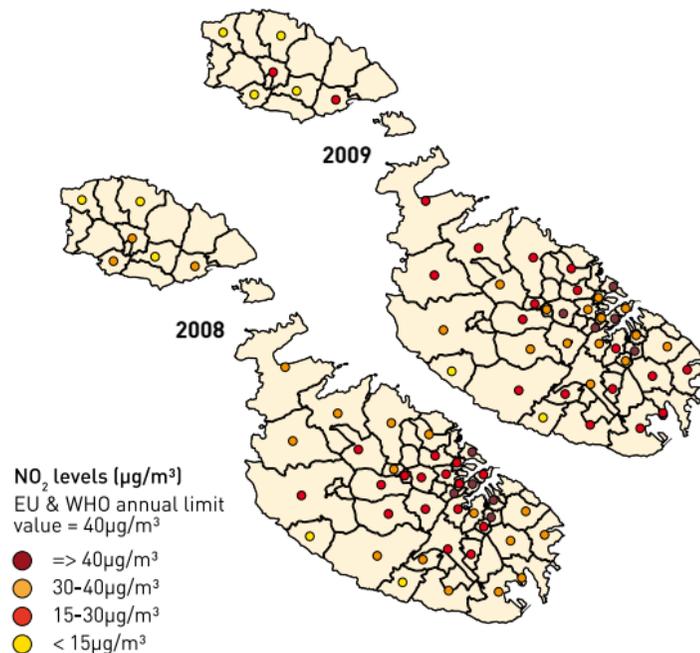
In terms of particular sites, and in line with the trend between 2005 and 2007, the highest benzene concentration was recorded at St. Anne's Street, Floriana ($6.4\mu\text{g}/\text{m}^3$). The annual average concentration at this site decreased slightly from $6.5\mu\text{g}/\text{m}^3$ in 2007. In 2008, average annual concentrations at Valley Road in Birkirkara were on the borderline, at $5.1\mu\text{g}/\text{m}^3$. Annual average ambient concentrations of the solvent toluene increased slightly from $15.7\mu\text{g}/\text{m}^3$ in 2007 to $16.16\mu\text{g}/\text{m}^3$ in 2008. There are no recommended

limits for ambient toluene concentrations, although a $19,100\mu\text{g}/\text{m}^3$ limit exists for workplace exposure.²² No recommended limits are available for ethylbenzene and xylene. The annual ambient concentration of ethylbenzene in 2008 was $3.6\mu\text{g}/\text{m}^3$, compared to $3.2\mu\text{g}/\text{m}^3$ in 2007, while annual ambient concentrations of mp-xylene and o-xylene were $9.6\mu\text{g}/\text{m}^3$ and $3.9\mu\text{g}/\text{m}^3$ respectively in 2008, up slightly from the $9.4\mu\text{g}/\text{m}^3$ and $3.6\mu\text{g}/\text{m}^3$ concentrations in 2007.

A4 NITROGEN DIOXIDE CONCENTRATIONS

☹️ **Key policy question:** Do nitrogen dioxide concentrations in Malta meet EU air quality standards?

Nitrogen dioxide (NO_2) is a toxic gas at short-term concentrations exceeding $200\mu\text{g}/\text{m}^3$, and long-term exposure at lower concentrations. It forms acids when it interacts with water vapour, and forms nitrates and other harmful compounds when it interacts with other particles.²³ NO_2 is a direct result of fossil fuel burning (such as in power generation and vehicle engines), as well as of natural sources such as lightning. Between 2008 and 2009 the annual average national NO_2 concentration decreased slightly from $29\mu\text{g}/\text{m}^3$ to $28.2\mu\text{g}/\text{m}^3$, remaining well below the $40\mu\text{g}/\text{m}^3$ EU and World Health Organisation (WHO) limit value. In 2009, annual average values exceeded annual EU standards in 5 localities: Floriana ($70.6\mu\text{g}/\text{m}^3$); Hamrun ($50.3\mu\text{g}/\text{m}^3$); Fgura ($49.3\mu\text{g}/\text{m}^3$); Birkirkara ($44.3\mu\text{g}/\text{m}^3$); and, Sliema ($42.2\mu\text{g}/\text{m}^3$). In addition, 22 individual sites registered NO_2 levels higher than the EU and WHO limit, with St. Anne's Street recording the highest value ($98.1\mu\text{g}/\text{m}^3$). In 2009, the hourly limit value [not to be exceeded for more than 18 hours per year] was not exceeded in any of the monitoring stations.

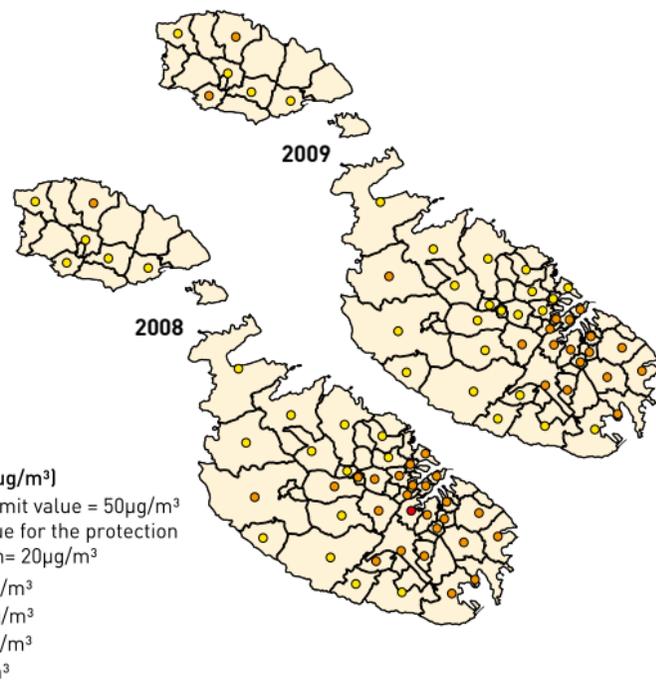


Source: MEPA

A5 SULPHUR DIOXIDE CONCENTRATIONS

😊 **Key policy question:** Do sulphur dioxide concentrations in Malta meet EU air quality standards?

Sulphur dioxide (SO_2) adversely affects the human respiratory system and damages water bodies, soils, vegetation and limestone buildings. It originates both from natural sources such as volcanoes, as well as human activities including fuel and biomass combustion.²⁴ SO_2 pollution from international shipping is also a matter of increasing concern. Sulphate particles combine with other atmospheric compounds to become important contributors to particulate formation.²⁵ National annual average SO_2 concentrations decreased by 20% between 2008 and 2009 [from $6.5\mu\text{g}/\text{m}^3$ to $5.2\mu\text{g}/\text{m}^3$] remaining well below the EU annual limit value ($50\mu\text{g}/\text{m}^3$) and the EU critical level for the protection of vegetation ($20\mu\text{g}/\text{m}^3$). The decrease in SO_2 concentration is perhaps in line with the 5% decrease in electricity generation in this period,²⁶ together with the fall in fuel imports.²⁷ In addition, locality averages were all found to be below the EU limit value for the protection of vegetation, and decreases were registered in almost all localities. The highest levels were recorded in Marsalforn ($12.9\mu\text{g}/\text{m}^3$), followed by Paola ($12.2\mu\text{g}/\text{m}^3$) and Fgura ($11.9\mu\text{g}/\text{m}^3$). Victoria in Gozo registered the lowest SO_2 concentration in 2009 at $1.9\mu\text{g}/\text{m}^3$, decreasing from $3.3\mu\text{g}/\text{m}^3$ in 2008. As in 2008, the daily average limit value and the hourly limit value were not exceeded at the 3 real-time stations in 2009.



Source: MEPA



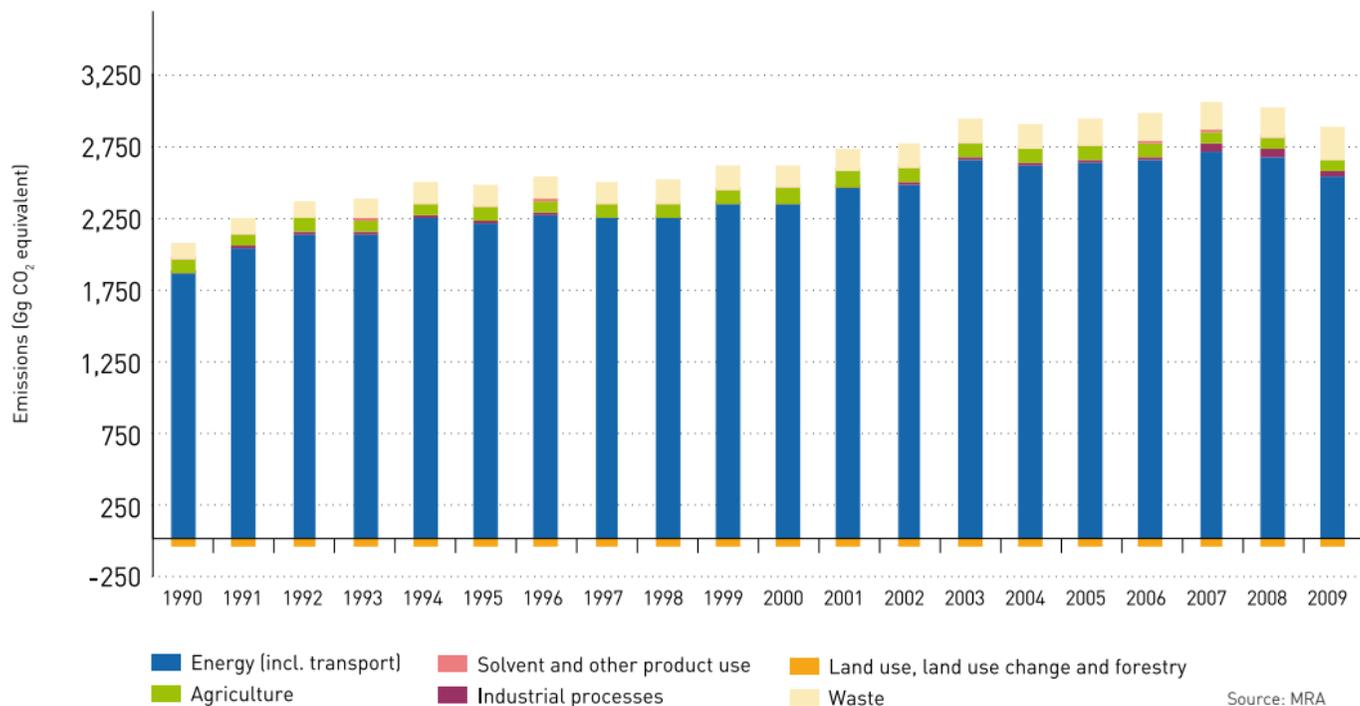
KEY FACTS

CLIMATE CHANGE

- Although Malta's estimated GHG emissions increased by 39% since 1990, they decreased slightly by 5% between 2008 and 2009.
- Malta's energy intensity, in terms of fuel used per Euro GDP, continued to decline in 2009, mostly reflecting the fall in fuels imported that year.

CC1 GREENHOUSE GAS EMISSIONS BY SECTOR

 Key policy question: What is the trend in Malta's greenhouse gas emissions?



Source: MRA



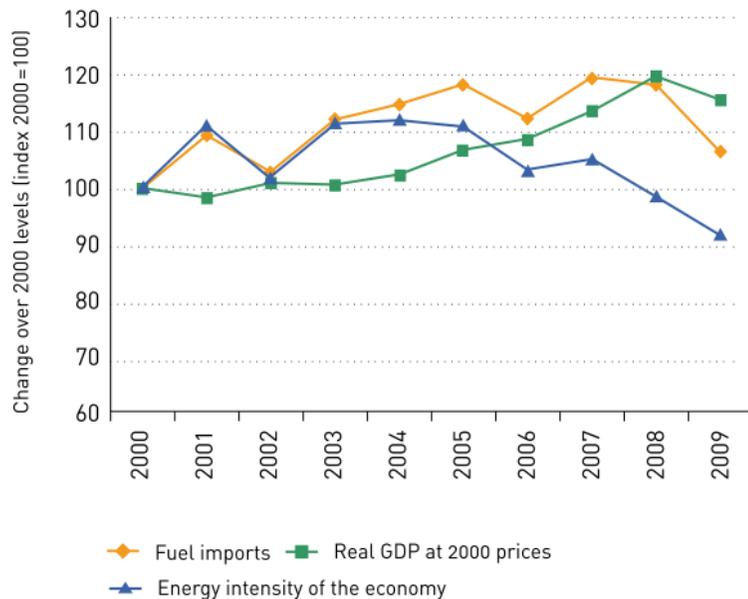
Greenhouse gases (GHGs) arising from human activities trap heat within the atmosphere, giving rise to increasing global temperatures. As a small Mediterranean island with a large coastal area, Malta is vulnerable to climate change. Malta's GHG emissions over the period 1990–2009 show an overall increase of 39%, though instances of decreasing emissions have been observed in certain years (e.g. between 2003–2004 and 2007–2009). Similar to previous years, in 2009 the emissions mainly derived from the energy sector (including transport) with 87.9% of total. This was followed by waste (7.6%), while agriculture and industrial processes, together with the solvent and other product use sectors,

contributed to almost 4.5% of GHG emissions. The category Land-Use, Land-Use Change and Forestry refers to estimates of carbon dioxide emissions and removals by particular vegetation types, and is estimated to have contributed to the removal of just over 2.1% of emissions in 2009. Between 1990 and 2009, emissions per unit GDP decreased by 36.7%, to 488Gg per billion Euros at constant 2000 prices, possibly reflecting a degree of decoupling of emissions from economic development over the whole time period. Per capita emissions increased by 22.3% during this period, to 6.8 tonnes per capita in 2009.²⁸

CC2 ENERGY INTENSITY OF THE ECONOMY

😊 **Key policy question:** Is Malta's economy becoming more energy-efficient?

Energy intensity is the ratio between total energy produced and GDP.²⁹ It is therefore a measure of the energy used to create a unit of economic wealth, measured in GDP. Net fossil fuel import values³⁰ may be used as an estimate of total energy produced in Malta. This indicator shows that energy intensity continued to decline over the last year, decreasing from 0.21 tonnes of oil equivalent per unit GDP (toe/€) in 2008 to 0.19 toe/€ in 2009, in most part reflecting the fall in fuels imported. When the overall trend over the last 10 years is considered, it emerges that there has been an overall slight decrease in energy intensity over this period. Should this trend continue it may point towards a relative decoupling of energy consumption from economic activity in the longer term.



Source: NSO



KEY FACTS

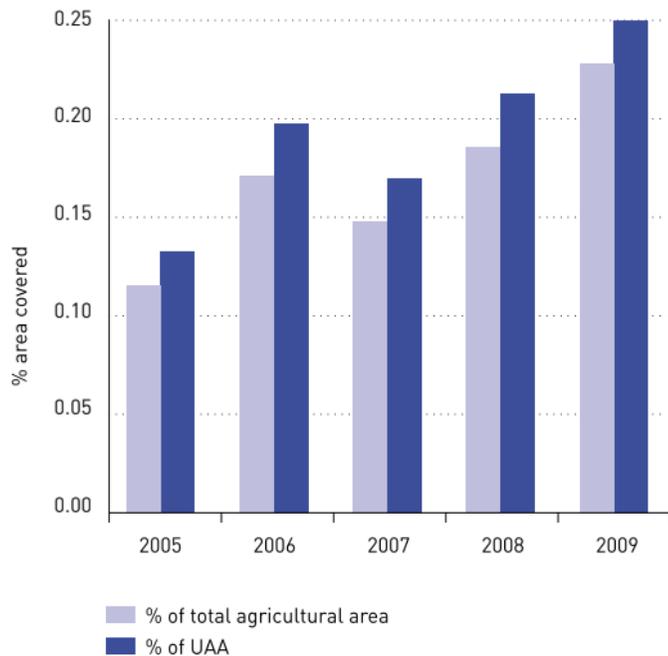
LAND

- The area covered by organic farming was equivalent to approximately 0.22% of total agricultural land in 2009, increasing by 4.46 hectares over 2008 figures.

L1 % ORGANIC FARMING

☹️ **Key policy question:** What percentage of Malta's agricultural land is under organic cultivation?

Organic farming is an agricultural system that aims to respect natural life-cycles during the production of food.³¹ Between 2008 and 2009, area covered by organic farming increased by 20%, covering 26.24ha of the Maltese Islands in 2009. This represented approximately 0.22% of total agricultural land and 0.25% of Utilised Agricultural Area (UAA). In 2009 there were 13 registered operators of organic products in the Maltese Islands. It is estimated that in 2009, 6% of the organically-cultivated land was used for the production of fresh vegetables, melons and strawberries, 24% for the cultivation of grapes, followed by 19% for root crops and olives respectively.



Source: MCCA; NSO



KEY FACTS

FRESH WATERS

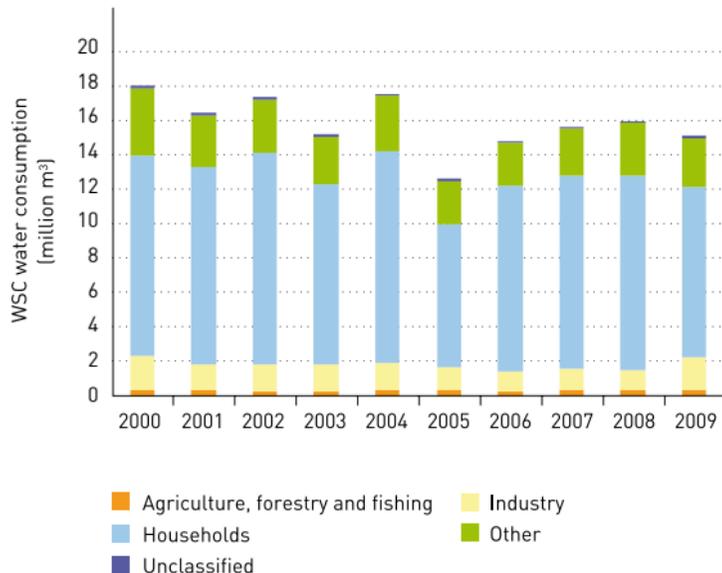
- Billed water consumption fell by 5.4% to 15 million m³ in 2009, and the overall decreasing trend in annual billed water consumption since 2000 persisted.
- Nitrate levels exceeded the EU limit value of 50mg/l in almost 90% (13 out of 15) of groundwater bodies in 2009.
- In 2009, the threshold value for chlorides was exceeded in all coastal groundwater bodies, and 3 out of 8 perched groundwater bodies, while the threshold value for the mean sea level aquifer was not exceeded.

W1 BILLED WATER CONSUMPTION BY SECTOR

☹️ **Key policy question:** What is the trend in billed water consumption?

In the Maltese Islands, fresh water supplied through the municipal distribution network originates from groundwater abstracted from the aquifers and from desalinated water produced in the 3 reverse osmosis plants present on the Islands. Between 2008 and 2009 billed water consumption from the main water provider, the Water Services Corporation (WSC), fell by 5.4% to 15 million m³, and the overall decreasing trend in annual billed waters consumption since 2000 persisted. As indicated in the chart, the main water consuming sector in 2009 was the households sector, with a share of 65% of total billed water consumption.³² The industrial sector, with a 13% share, was the second major consumer of billed water. In 2009 the agriculture, forestry and fishing sectors consumed 2% of total billed water. Fresh water originating from groundwater sources is also provided by private water suppliers, for which data is not yet available.

Note: The above values refer to actual consumption, and estimated consumption is not included. The Unclassified sector refers to economic units which could not be classified by NACE (Statistical classification of economic activities in the European Community) code.



Source: NSO

W2 NITRATE LEVELS IN GROUNDWATER BODIES

 **Key policy question:** What is the status of groundwater with respect to nitrates?

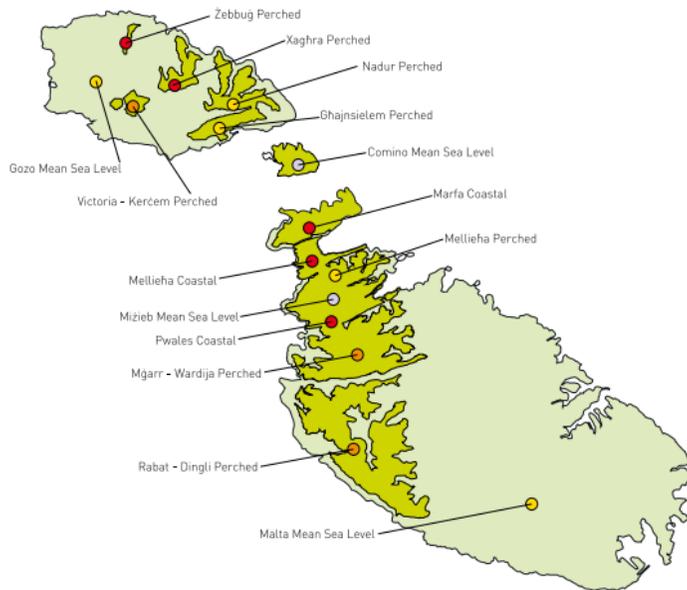
In 2009, nitrate levels exceeded the EU limit value of 50mg/l in almost 90% (13 out of 15) of groundwater bodies. The highest nitrate concentration (346mg/l) was recorded at Pwales coastal groundwater body, while the highest value in the perched aquifer was recorded at Żebbug at 315.9mg/l. Nitrate concentrations in the important mean sea level aquifer systems were also high, with mean levels of 73.9mg/l and 49.4mg/l being registered for the Malta and Gozo mean sea level groundwater bodies respectively. Overall, nitrate concentrations in the main sea level groundwater bodies are relatively stable. Under the Water Framework Directive Malta is bound to achieve good water status (defined by the 50mg/l limit in the case of nitrates) by 2015.³³

Nitrate levels in (mg/l)

[WFD trigger value=50mg/l]

- | | | | |
|---|-------------|---|--|
|  | >150mg/l |  | Upper Coralline Limestone aquifer system |
|  | 100-150mg/l |  | Lower Coralline Limestone aquifer system |
|  | 50-100mg/l | | |
|  | 0-50mg/l | | |

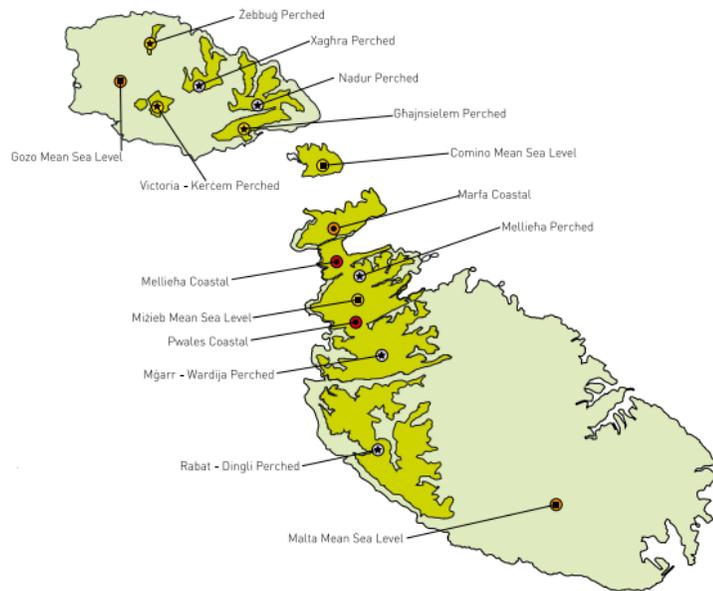
Source: MRA



W3 CHLORIDE LEVELS IN GROUNDWATER BODIES

Key policy question: What is the status of groundwater with respect to chlorides?

New national quality standards for groundwater (threshold values) have been established as part of the implementation process of the Water Framework Directive for parameters related to sea-water intrusion, anthropogenic pollution and geology. For chlorides, 3 separate threshold values have been established: 1000 mg/l for mean sea level groundwater bodies, 500 mg/l for coastal groundwater bodies, and 210 mg/l for perched groundwater bodies. The development of these threshold values takes into consideration specific 'use-requirements' (such as potable, irrigative, etc) as well as the natural background characteristics of each groundwater body. In 2009 the highest chloride concentration was recorded at Pwales coastal aquifer (2,430.7mg/l), which is almost 5 times more than the threshold value, while the lowest concentration was recorded at the Mellieha perched aquifer (143.4mg/l). At the same time, 3 out of 8 perched groundwater bodies exceeded the threshold value, while the limit value for the coastal aquifer was exceeded in all groundwater bodies. The threshold value for the mean sea level aquifer was not exceeded.



Chloride levels (mg/l)

- >1,000mg/l
- 500-1,000mg/l
- 210-500mg/l
- 0-210mg/l

Established Threshold Values and Quality Standards

- Mean Sea Level-1,000mg/l
- Coastal-500mg/l
- ★ Perched-210mg/l

- Upper Coralline Limestone aquifer system
- Lower Coralline Limestone aquifer system

Source: MRA



KEY FACTS

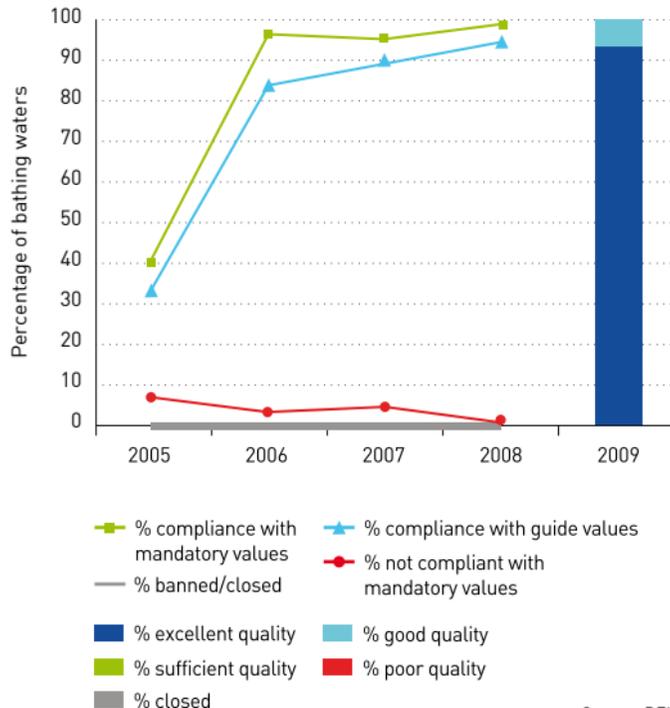
COASTAL AND MARINE ENVIRONMENT

- Malta's bathing waters were all of excellent (93.1%) or good (6.9%) quality in 2009.

CM1 BATHING WATER QUALITY

😊 **Key policy question:** Do Malta's bathing waters meet international standards?

A high level of bathing water quality is crucial for public health and the environment, and in this regard Malta must comply with standards under the EU Bathing Water Directive³⁴ and the Barcelona Convention.³⁵ In the 2009 bathing season Malta began to assess and report on bathing water quality under the new EU Bathing Water Directive, in which bathing waters are classified on the basis of 2 quality parameters.³⁶ The results are expressed in terms of excellent, good, sufficient, and poor quality or temporarily closed. In 2009,³⁷ based on 4 years data (2006 – 2009), 93.1% of coastal bathing waters qualified as of excellent quality, while 6.9% were of good quality, maintaining the high standards recorded in previous years, as indicated in the chart. The Barcelona Convention also changed classification parameters³⁸ and bathing water is classified as very good, good, fair or poor. In 2009, 98% of the 87 sites were classified as good or very good (95% and 3% respectively).



Source: DEH



KEY FACTS

RESOURCES AND WASTE

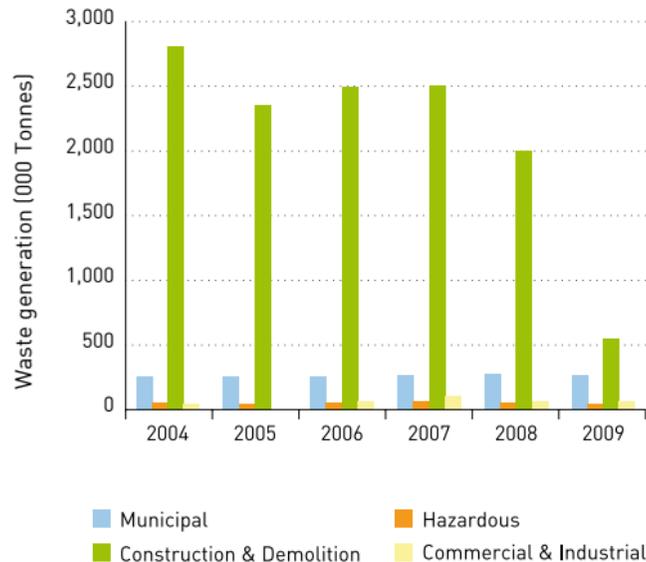
- Waste generated fell by 61.7% in 2009.
- The share of landfilled waste increased by 5% to 80% in 2009.
- Municipal waste generated decreased by 3% in 2009.
- In 2009, 3% (5,484 tonnes) of biodegradable municipal waste was diverted from landfills for recycling.

WS1 WASTE GENERATION

☹️ **Key policy question:** What is the trend in waste generation?

Waste generation and poor waste management practices may cause significant environmental impacts due to air pollution, contamination of surface waters and groundwater, land take-up for landfills, loss of natural resources, and negative effects on human health. Waste generation decreased by 61.7% between 2008 and 2009, mainly due to a reduction in construction and demolition waste. In line with EU standards,³⁹ waste generated is divided into 4 principal categories: municipal waste; hazardous waste; construction and demolition waste; and, commercial and industrial waste. The share of municipal waste increased from 11.5% in 2008 to 29.3% in 2009. Hazardous waste⁴⁰ registered an increase of 2.6% in share, rising to 5.1%, despite the fact that the amount generated decreased by 11,500 tonnes. Construction and demolition waste generated in 2009 represented 58.9% of total, while the share of commercial and industrial waste increased to 6.8% (from 2.6% in 2008). In 2009 the share of landfilled waste increased by 5% over the previous year to 80%. The remaining waste was recycled, stored or exported, and some construction and demolition waste was disposed of at sea.

Note: 2009 construction and demolition waste data is provisional.

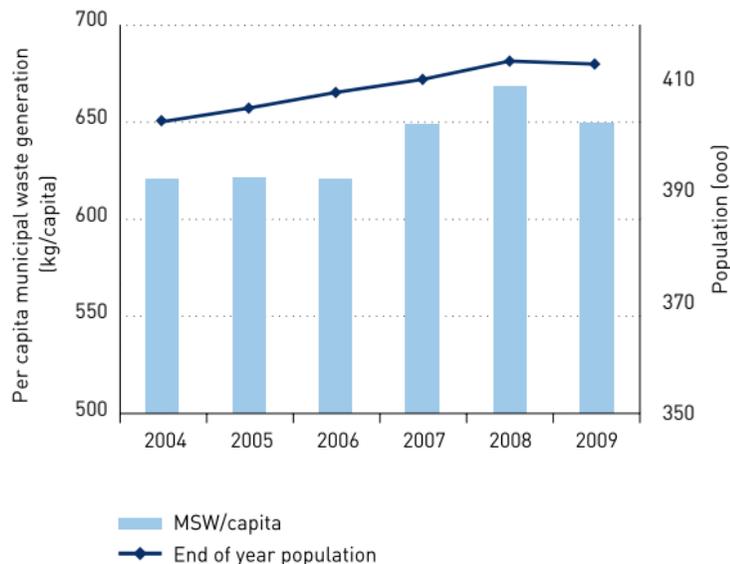


Source: NSO

WS2 MUNICIPAL WASTE GENERATED PER CAPITA

☹️ **Key policy question:** What is the trend in municipal waste generation?

Municipal waste is composed of waste collected from households, as well as other waste similar in nature and composition to waste from households.⁴¹ This waste stream provides the best indicator for assessing performance in terms of generation and management of waste due to its close relationship with consumption and GDP.⁴² Between 2008 and 2009 municipal waste⁴³ generated decreased by 3% to 267,774 tonnes, most of which (95%) was landfilled.⁴⁴ This slowdown in comparison with the increasing trend registered over the last 6 years may be attributed to the current economic climate. In 2009 4% of municipal waste was recycled, up from 3% in 2008. In 2009, each Maltese resident generated 648kg of municipal waste, 19kg less municipal waste per capita than in 2008⁴⁵ but still relatively high in comparison with the EU average, which was 512kg per capita in that year.⁴⁶

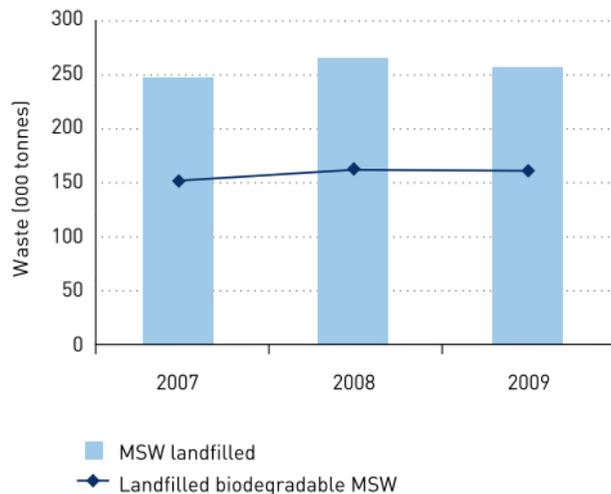


Source: NSO

WS3 BIODEGRADABLE WASTE

Key policy question: What is the trend in disposal of biodegradable waste?

Biodegradable waste includes kitchen and garden waste, as well as paper and cardboard.⁴⁷ The majority of landfilled municipal waste in Malta is biodegradable. The Landfill Directive includes targets to reduce landfilling of biodegradable waste, with a view to increasing the recycling rate for this type of waste.⁴⁸ In 2009, 95% of municipal solid waste (MSW) generated was landfilled, including 161,262 tonnes of biodegradable municipal waste. In 2009, 3% (5,484 tonnes) of biodegradable municipal waste generated was diverted from landfills for recycling through the Material Recovery Facility at Sant' Antnin Solid Waste Treatment Plant, which first came into operation in February 2008. The Sant' Antnin Plant will eventually be responsible for the diversion of recyclable paper and cardboard and 35,000 tonnes of organic waste from landfills. In addition Malta intends to commission 2 Mechanical Biological Treatment plants by 2014; 1 in the north of Malta and another in Gozo. These facilities will ensure that Malta moves towards meeting its recycling targets, as well as contributing towards the country's share of renewable energy from the recycling and recovery of municipal solid waste.



Source: NSO



KEY FACTS

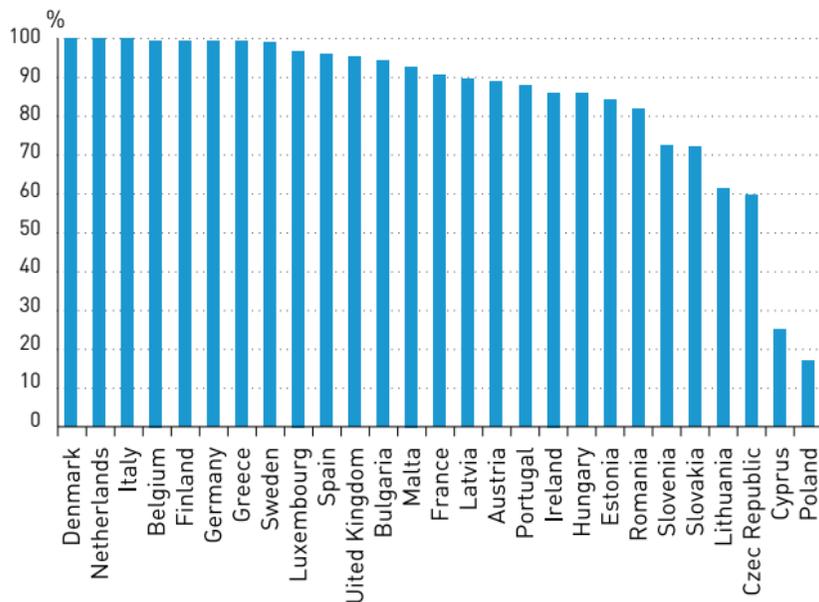
BIODIVERSITY

- In 2008 Malta's sufficiency in designating terrestrial Natura 2000 sites under the EC Habitats Directive was above EU average at 92.6%.

B1 SUFFICIENCY OF TERRESTRIAL NATURA 2000 AREAS DESIGNATED

😊 **Key policy question:** How sufficient are Malta's designations of terrestrial Natura 2000 sites?

A number of Malta's protected areas form part of the EU network of protected areas, known as the Natura 2000 network, covering 13.3% of the land area. EU agreements require Member States to propose sites that afford protection to habitats and species listed in the Annexes of the relevant EU legislation. The European Commission (EC) hence assesses the sufficiency of the sites designated to afford such protection. In 2008³⁰ the sufficiency for the designation of terrestrial Natura 2000 sites under the EC Habitats Directive for Malta was of 92.6%. This is considered good status when compared to other Member States (see chart): the EU average was 84.2% in that year.



Source: <http://www.eea.europa.eu/data-and-maps/figures/sufficiency-index-state-of-progress-by-member-states-in-reaching-sufficiency-for-the-habitat-directive-annex-i-habitats-and-annex-ii-species-2>, accessed on 30th November 2011

Note: Latest available data is for 2008.



KEY FACTS

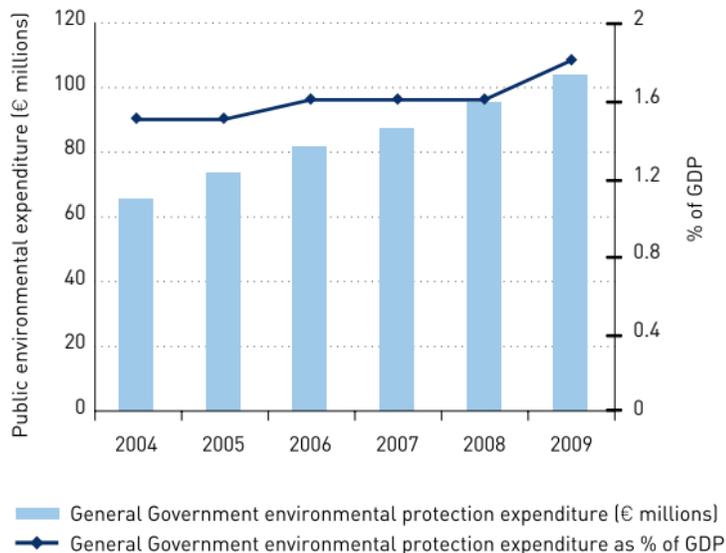
POLICY RESPONSES

- Public environmental expenditure increased by 9% in 2009, rising to €103.5 million, which is equivalent to 1.8% of GDP.
- In the 2009/10 scholastic year, 102 schools participated in the EkoSkola programme, involving almost 40,889 students.
- As of end 2009, 13 installations in the chemical, energy, and waste management sectors required an IPPC permit, and 9 of these installations had been permitted.

PR1 PUBLIC ENVIRONMENTAL EXPENDITURE

😊 **Key policy question:** What share of GDP is Government spending on the environment?

Public environmental expenditure provides an indication of the state's response to environmental issues. In 2009 Government spent €103.5 million on the environment (based on Eurostat's Classification of the Functions of Government [COFOG]), up by 9.1% over 2008 (€94.9 million). This expenditure represented 1.8% of GDP, slightly increasing (0.2%) over the 1.6% registered annually between 2006 and 2008. As in previous years, most (80.5%) of the expenditure was related to solid and liquid waste management, which was almost divided equally between the two. This was followed by 17.4% for the protection of biodiversity and landscape (this category includes MEPA's Environment Directorate expenses) and 1.9% went to environmental protection not elsewhere classified. This last category includes various environmental initiatives and campaigns, funds for green leaders and green wardens and matching national funds related to EU projects. Overall, environmental expenditure represented 4.1% of general Government expenditure, in comparison with 11.6% that went to economic affairs, such as agriculture, fuel and transport, and 34.3% to social protection.

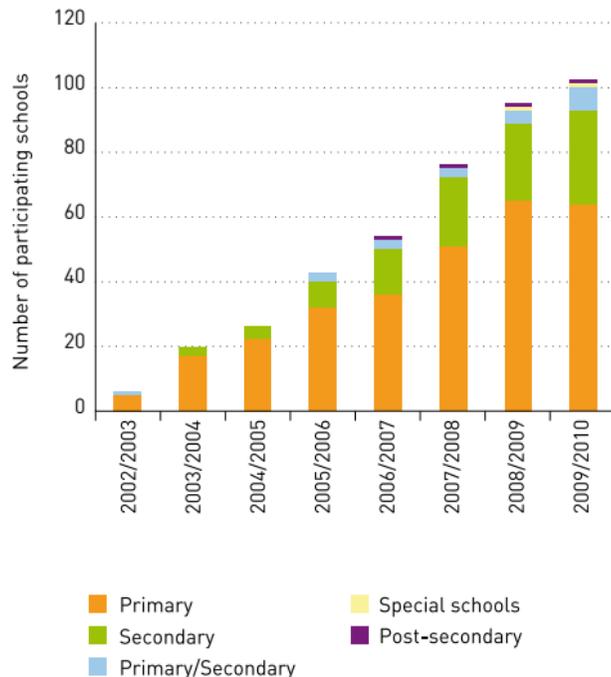


Source: NSO 2011b

PR2 SCHOOLS COVERED BY EKOSKOLA

😊 **Key policy question:** How many schools are taking part in the EkoSkola environmental education programme?

The last 2 scholastic years continued to register an increase in the number of schools and students participating in the EkoSkola environmental programme. Between the 2007/08 and 2009/10 scholastic years 26 more schools participated in the programme, bringing the total number of participating schools up to 102, involving almost 40,889 students. Most of the participating schools provide primary education. During the 2008/09 and 2009/10 scholastic years a total of 10 schools were awarded the Green Flag, a prestigious internationally recognised and respected eco-label indicating high performance. This brings the total of Green Flag schools up to 11. Eco-Schools is an international programme for environmental management and certification, designed to implement sustainable development education in schools.⁴⁹ The programme is coordinated by the non-governmental organisation Nature Trust (Malta), and involves student participation, decision-making, planning and activities, thus contributing to the implementation of Local Agenda 21 in the school community.

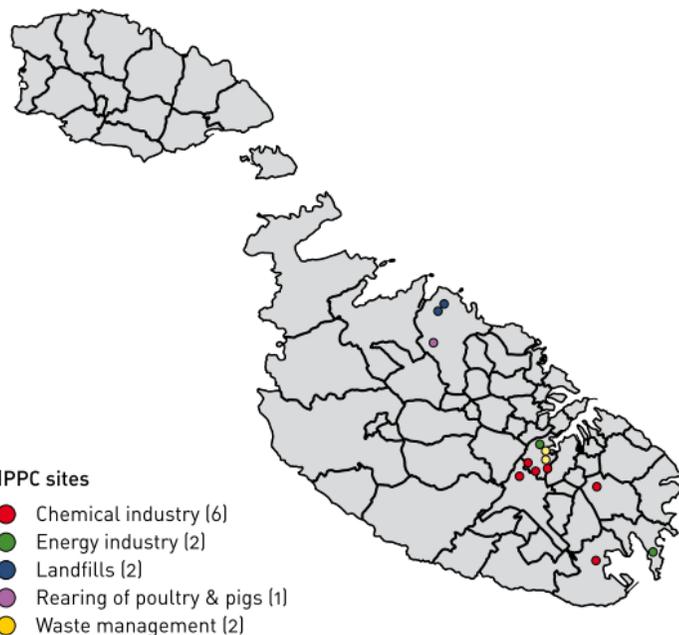


Source: Nature Trust (Malta)

PR3 SITES REQUIRING INTEGRATED POLLUTION PREVENTION AND CONTROL PERMITS

😊 **Key policy question:** What is the status of permitting of IPPC sites?

The environmental permitting of particular operations is a key tool for ensuring the achievement of environmental quality standards. The environmental permitting system ensures that certain types of activities are obliged to obtain operational permits, due to their nature, scale or environmental impact. Permits are granted on the basis of achievement of particular environmental standards, and are underpinned by regular environmental audits. The Integrated Pollution and Prevention Control (IPPC) Directive and its corresponding national legislation⁵⁰ provide the legal basis for this. Permitting legislation takes an integrated approach, taking into consideration the entire environmental performance of the plant, and obliging operators to use best available techniques. The IPPC process also includes public participation, by means of which citizens have access to applications, permits, and the results of releases monitoring. As of end 2009, 9 of the 13 installations requiring an IPPC permit had been permitted, improving on the situation in 2008, when 6 of the 14 installations requiring a permit had been permitted.⁵¹ Various types of operations require environmental permits, and the current list of IPPC installations includes operations in the chemical and energy sector, and certain waste management facilities. In addition as of end 2009, 72 environmental permits were given to non-IPPC sites.



Source: MEPA



PR4 TAKE-UP OF VOLUNTARY ENVIRONMENTAL SCHEMES

 **Key policy question:** How many organisations in Malta are certified under voluntary environment schemes?

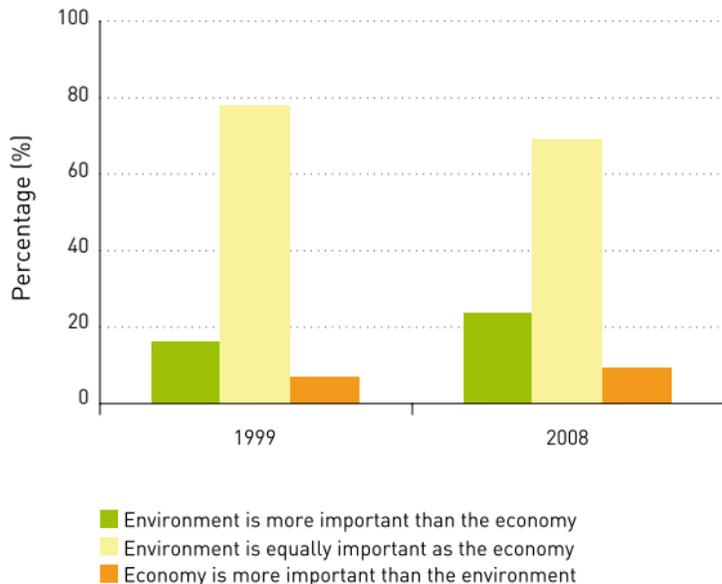
Voluntary environmental schemes are an effective tool through which companies voluntarily improve their environmental performance and apply for certification based on agreed environmental standards. By end 2009 the Malta Competition and Consumer Affairs Authority had certified 3 organisations to ISO 14001: ELEPAC Ltd, ADI Associates Consultants Ltd and PlayMobil Malta Ltd, while several other Maltese companies, including General Soft Drinks, Methode, Trelleborg and ST Microelectronics, have been certified by foreign certification bodies. ST Microelectronics is also the only EMAS-registered site in Malta. The Hilton Malta remains the only European eco-labelled

tourist accommodation in Malta. In 2009 18 hotels (17 in Malta and 1 in Gozo)⁵² were eco-certified through the Malta Tourism Authority eco-certification scheme. To obtain eco-certification, a hotel must meet the 38 compulsory criteria and at least a further 27 criteria from a list of 62. The scheme includes criteria on environmental management, staff training, waste management, procurement, energy, water, air quality, noise, buildings and green areas, local culture and information dissemination. The eco-certification criteria are currently being reviewed to be in line with the Global Sustainable Tourism Council criteria.⁵³

PR5 TRENDS IN PUBLIC ATTITUDES

😊 **Key policy question:** What is the trend in Maltese public attitudes towards the environment?

MEPA's 2008 Public Attitude Survey identified changes in public environmental perceptions when compared with results from similar surveys carried out in 1991 and 1999. Almost a quarter of respondents considered the environment more important than the economy in 2008, compared to 15% in 1999, while 69% of respondents considered the 2 equally important in 2008, compared to 78% in 1999. Through another question, it emerges that between 1999 and 2008, waste and air quality switched positions as the environmental problem of greatest concern, such that air quality was the top concern in 2008 (mentioned by 70% of respondents, compared to 52% in 1999). In 1991, 74% of respondents had agreed that air pollution was a serious problem. Building development was also explored in all 3 surveys. There was a marked decrease of 25% between 1999 and 2008 in the respondents who agreed that new buildings should be higher (34% in 2008 and 59% in 1999). In 2009 Maltese respondents took part in 2 separate Eurobarometer surveys.⁵⁴ Maltese respondents, in common with those from France, Slovenia, Austria and Luxemburg, were most likely to answer that they are generally aware of the environmental impact of products. Maltese respondents (65%) said they were fully aware or know about the most significant environmental impacts of the products they buy or use, while the average for all respondents is 55%. Furthermore, respondents from Sweden, Malta (61%) and the Cypriot Community were the most likely to mention "climate change" as being the most serious problem facing the world today.



Source: Ernst & Young 2010



ENDNOTES

1. MEPA.
2. NSO.
3. These include the effort sharing decision, which limits the emissions from the non-EU ETS sector to +5% over the 2005 emissions, by 2020 (Decision 406/2009 EC); a 10% RES target of total energy consumption by 2020; and, a 10% target related to share of renewable energy in transport, by 2020 (Directive 2009/28/EC transposed into LN 538 of 2010).
4. NSO.
5. NSO.
6. NSO 2010.
7. EEA 2005.
8. Annesi-Maesano *et al.* 2007.
9. PM_{10} refers to particles with an aerodynamic diameter smaller than $10\mu m$ while $PM_{2.5}$ refers to particles of diameter smaller than $2.5\mu m$, with the latter being the more dangerous for human health due to their deeper lung penetration.
10. EEA 2005.
11. EC-DG Env 2006.
12. Compounds that are required for the formation of O_3 .
13. EEA 2007.
14. Nolle *et al.* 2005.
15. The EU Air Quality Directive (2002/3/EC).
16. The reason for this is that the nitrogen monoxide present in high concentration levels in these areas reacts with O_3 to form nitrogen dioxide, thus reducing O_3 concentrations.
17. EC 2006.
18. www.epa.gov/iaq/voc.html, accessed on 30th November 2011.
19. See indicator on ozone.
20. Permanently altering the genetic coding of a cell.
21. Nolle *et al.* 2005.
22. HSE 2007.
23. WHO 2006.
24. Nolle *et al.* 2005.
25. Versteng *et al.* 2007; CEC 2005 and EEA 2007.
26. NSO.
27. NSO.
28. MRA.
29. For indicator definition please see <http://www.eea.europa.eu/data-and-maps/indicators/total-primary-energy-intensity> (accessed on 30th November 2011).
30. Almost all energy is generated from imported fossil fuels, whether this is in power plants, motor vehicle engines, or other combustion processes.

- Amounts used refer to gross inland fuel consumption net of aviation and bunkering.
31. http://ec.europa.eu/agriculture/organic/organic-farming/what-organic_en, accessed on 30th November 2011.
 32. Note that annual WSC billed water consumption is based on billing dates not on consumption dates. Some billing may take place in the year following actual consumption.
 33. The implementation of the Nitrates Action Programme (2010) will be a key measure in this regard.
 34. 2006/7/EC.
 35. Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean.
 36. In previous years assessments were carried out under Directive 76/160/EEC and bathing water had to comply with mandatory and guide values.
 37. Including data from 2006, 2007 and 2008 as per assessment procedures under Directive 2006/7/EC.
 38. Classification is now based on the intestinal enterococci parameter instead of faecal coliform counts.
 39. Regulation (EC) No 2150/2002.
 40. Hazardous waste figures are estimates.
 41. Article 2 of Council Directive 1991/31/EC of 26 April 1999 on the landfill of waste.
 42. EEA 2007.
 43. Consisting of mixed municipal waste, street cleansing residues, bulky waste and mixed municipal waste.
 44. NSO.
 45. Municipal waste generation per capita is based on end of year population figures.
 46. http://epp.eurostat.ec.europa.eu/portal/page/portal/waste/datasetectors_municipal_waste, accessed on 28th November 2011.
 47. <http://glossary.eea.europa.eu>, accessed on 15th September 2011.
 48. EEA 2011.
 49. <http://www.eco-schools.org/>, accessed on 30th November 2011.
 50. Council Directive (EC) 2008/1/EC concerning integrated pollution prevention and control, transposed by LN 234 of 2002, Environment Protection Act (Cap 435) Integrated Pollution Prevention and Control (Amendment) Regulations, as amended.
 51. For more information see <http://www.mepa.org.mt/ipcc-applications-installations> (accessed on 30th November 2011).
 52. MTA.
 53. <http://www.gstcouncil.org>, accessed on 11th October 2011.
 54. EC 2009a and EC 2009b.



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PHOTO CREDITS

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ACRONYMS

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	COFOG	Classification Of the Functions of Government
EC	European Commission	EU	European Union
DEH	Directorate for Environmental Health	GHG	Greenhouse Gases
GDP	Gross Domestic Product	MEPA	Malta Environment & Planning Authority
IPPC	Integrated Pollution Prevention and Control	MRA	Malta Resources Authority
MSW	Municipal Solid Waste	NO ₂	Nitrogen dioxide
NSO	National Statistics Office	O ₃	Ozone
PM	Particulate Matter	SO ₂	Sulphur dioxide
UAA	Utilised Agricultural Area	VOCs	Volatile Organic Compounds
WHO	World Health Organisation	WSC	Water Services Corporation



THE ENVIRONMENT REPORT INDICATORS 2009



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