



THE ENVIRONMENT
REPORT

tracking the environment

Malta Environment & Planning Authority

THE ENVIRONMENT REPORT

INDICATORS 2010-2011

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These indicators have been compiled by MEPA
in partnership with the National Statistics Office



NATIONAL STATISTICS OFFICE • MALTA

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INTRODUCTION

Welcome to The Environmental Report Indicators 2010-2011, which track progress on recent trends related to the Maltese environment. This is the 6th annual publication of its kind. The booklet aims to provide easy access to environmental information for policy-makers, organisations and the general public, complementing the state of the environment report, which is published every 3 years.

This booklet updates the last booklet published in 2011, which reflected the situation in 2009. This year, we are publishing data on the basis of 'latest available data', so in many cases the 2009 data is updated with data from 2011, and a comparison is made with the previous year, as in past publications.

In order to help readers track progress easily, each indicator is accompanied by a smiley 😊, neutral 😐 or sad 😞 face. Indicators are awarded a smiley (or not) depending on 2 criteria: the overall dimension of the environmental problem, as well as the trend. Thus, an indicator is awarded a smiley if an improvement was registered and the recent trend is positive. On the other hand, an indicator is awarded a neutral or sad face where there was no improvement or where the recent trend was negative.

This environmental indicators booklet is published by the Malta Environment and Planning Authority in partnership with the National Statistics Office, and is based on datasets from across the Maltese Government and other organisations. This publication, together with datasets and maps, can be downloaded from the Authority's website (www.mepa.org.mt/teri2010-2011).

KEY FACTS

DRIVING FORCES FOR ENVIRONMENTAL CHANGE

PERMISSIONS ISSUED FOR NEW DWELLING UNITS CONTINUED TO DECLINE IN 2011, FALLING BY 11%, TO 3,955 IN THIS PERIOD.

THE STOCK OF **LICENSED MOTOR VEHICLES** CONTINUED TO INCREASE IN 2011, TO REACH 311,947 VEHICLES.

ELECTRICITY GENERATED RETURNED TO A LEVEL SIMILAR TO 2009 IN 2011, AFTER A SLIGHT DECREASE IN 2010.

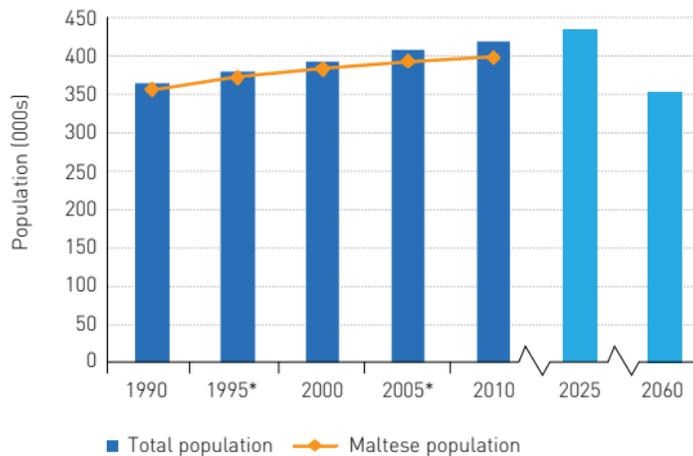
TOURIST NUMBERS INCREASED BY 5.6%, TO 1.4 MILLION IN 2011, WHILE TOTAL BED-NIGHTS INCREASED BY 4.8%.



DF1 POPULATION CHANGES

Key policy question: What impact are changes in the Maltese population and its distribution having on the environment?

Demographic change is one of the main drivers of environmental change, affecting demand for housing, transport, minerals, energy and water production. Malta's population is estimated to have reached 417,617 in 2010, increasing marginally by almost 1% over 2009. Of the 6 census districts, the Northern Harbour district is the most populous, containing an estimated population of 123,758 in 2010, as compared to the least populous district, Gozo and Comino, which had an estimated population of 31,419 persons. The most populous locality is Birkirkara, with an estimated 22,613 persons residing within it, and the least populated is Mdina with an estimated 253 inhabitants. Between 2009 and 2010, population increased in all districts except the Southern Harbour district, where it fell by 0.1% or 70 of its inhabitants. The district with the largest increase in population was the Northern Harbour district, where population is estimated to have increased by 1.4%, or 1,739 inhabitants. In terms of particular localities, the locality that experienced the highest percentage increase in population growth is St. Julian's, where the population is estimated to have increased by 6.1% over the same period, followed by Ta' Xbiex, with an estimated increase of 3%, and Mdina at 2.8%. The locality that is estimated to have experienced the greatest population decline, on the other hand, is Floriana, where the population is estimated to have declined by 2.4%, followed by Marsa, with an estimated decline of 1%. These estimates suggest that there



*based on census taken that year.

Source: NSO 2011

continues to be a decline of population in the older settlements around the Grand Harbour (Southern Harbour district), and an increase in population in the newer settlements in the Northern Harbours district. The National Statistics Office (NSO) forecasts that population will reach 429,000 by 2025, however, it is projected that

the population will fall to just over 350,000 by 2060.¹ This decline may result in decreasing pressures on the environment if accompanied by a shift towards more sustainable consumption patterns. Projections also indicate a continuously ageing population with a 72% increase in persons aged 65 and over between 2010 and 2060.

DF2 SECTORAL CONTRIBUTIONS TO GDP

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



Source: NSO 2012a

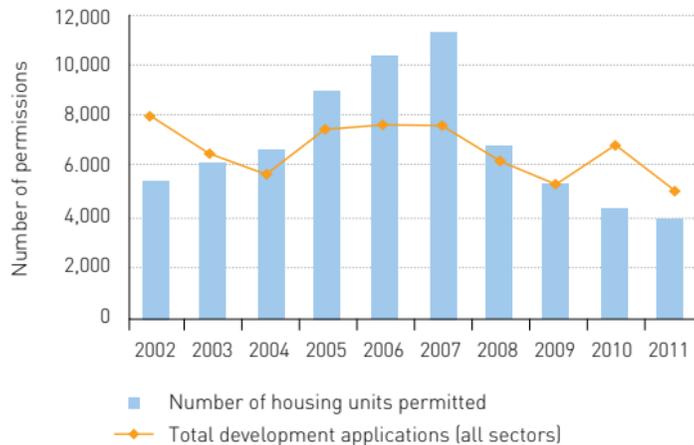
Malta's gross domestic product (GDP) increased by 4.4% (2.1% in constant 2000 prices) in 2011. In 2011, in line with the trend since 2000, the services sector continued to dominate the Maltese economy, representing 80.0% of total economic activity. This may, at face value, indicate a shift towards a less resource-intensive economy, particularly considering that the sub-sectors include real estate, financial and insurance activities, and, information and communication. The primary productive sector, which includes agriculture and fisheries, remained stable at 1.8% of GDP in 2011 as compared with 2009 and 2010. On the other hand, the share of the secondary sector, which includes sub-sectors such as mining and quarrying, water supply and manufacturing, declined by 1.7 percentage points reaching 18.3% in 2011. The share of the secondary sector has been declining since 2004. This is of interest since many of the activities in this sector have significant environmental impacts. For example mining and quarrying is of concern due to resource depletion, impacts on the surroundings, land take up, etc. Despite the overall decline in the secondary sector, the share of manufacturing in GDP increased by 0.1 percentage points to 13.2% in 2011, indicating the resilience of this sub-sector, as well as the need to continue to address its environmental impacts.

The share of mining and quarrying; electricity, gas, steam and air conditioning supply; water supply; sewerage, waste management and remediation activities declined slightly by 1.6 percentage points to 1.1% of GDP in 2011. During the same period, the share of construction, as well as the sub-sector in concrete terms, decreased slightly by 0.2 percentage points reaching a level of 4.0% of total GDP. This activity may be negatively correlated with environmental quality. The share of the tertiary services sector increased by 1.7 percentage points in 2011 (80.0%). Among the activities within the services sector, real estate activities contributed to 6.2% of GDP in 2011, similar to 2010. On the other hand, the share of wholesale and retail trade, repair of motor vehicles and motorcycles, transportation and storage, and accommodation and food service activities, registered a slight increase in share (0.2 percentage points) at 22.1% of GDP in 2011. Within this group, transport activity has a major environmental impact, mainly, but not exclusively, in terms of air pollution. The information in this indicator should be viewed together with the information on the overall environmental performance of the economy contained in the indicators on energy intensity of the economy and domestic material consumption.

DF3 NUMBER OF HOUSING UNITS PERMITTED

 **Key policy question:** What is the trend in units permitted for housing development?

Trends in permissions granted for housing units, as well as total development applications submitted, provide an indication of the pressures on land resources from the construction sector. Between 2010 and 2011 the number of permissions issued for new dwelling units declined by 11.0%, from 4,444 to 3,955. While 82.8% of all dwelling units permitted were apartments, 2011 registered a decline of 1.2 percentage points in permissions for this type of dwelling relative to other dwelling types. As a result of the declining trend relating to permissions for apartments, while in 2007 (the peak year in terms of apartments permitted) 10,252 apartments were permitted, the figure for 2011 was 3,276. During 2011, there was a 24.6% decrease in the total number of development applications received.



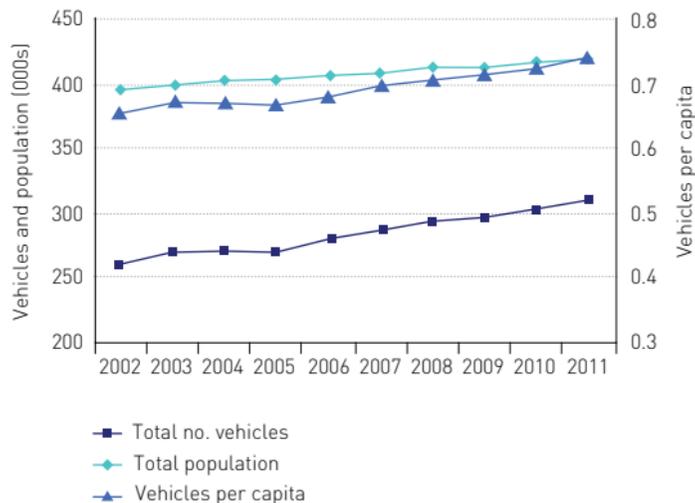
Source: MEPA Dwellings Database

DF4 VEHICLE FLEET PER CAPITA

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

Malta's land transport sector primarily depends on private personal mobility. There is a large number of vehicles relative to the population, which has a negative impact on human health and the environment, as well as the economy. In 2011 the stock of licensed motor vehicles increased by 2.4% to 311,947, while the number of vehicles per capita increased marginally to 0.74 from 0.73 in 2010. In 2011, 60% (11,292) of imported and licensed vehicles were second-hand, down from a share of 66% in 2010. The share of imported second-hand vehicles is of particular concern since second-hand vehicles imported from the European Union (EU) can be registered in Malta with emission standards that are not as stringent as those required for new vehicles, since these would have been previously registered elsewhere in the EU. At the end of 2011, the average age of the national vehicle stock was 13.9 years.² In 2011 there were 26 licensed electric motor vehicles, down from 30 in 2010 while there were 18 electric motorcycles, 6 more than in 2010.³ In 2011, public transport patronage was estimated at 32.8 million passengers, growing by 4.8%, in line with the 3.5% rise in 2010.⁴

Note: The figures for total number of vehicles in 2008 and 2009, as well as the population figure for 2009 were revised by NSO. Total end of year population figure for 2011 is provisional.

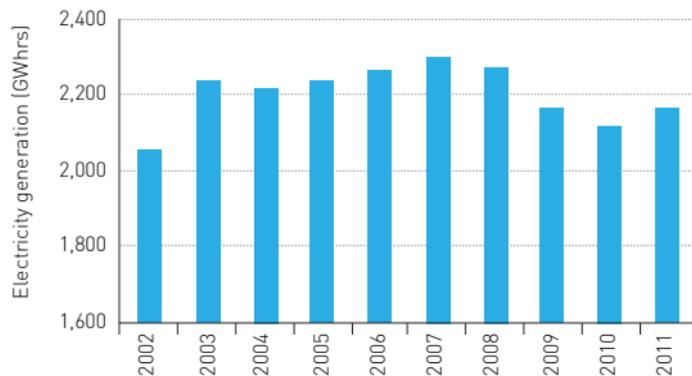


Source: NSO

DF5 ELECTRICITY GENERATION

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

The production of electricity from fossil fuels is one of Malta's main sources of air pollution, and also contributes to climate change. In 2011, 73% of fuel utilised in Malta went to power generation, rising slightly from 71% in 2010.⁵ In 2011 electricity generated increased by 2.6% to 2,169 gigawatt hours (GWhrs).⁶ The government is currently investing in the Delimara power station extension, to be operational in mid-2012, as well as in the submarine cable connecting Malta to the continental electricity grid, which should be in place by the end of 2013. These developments will result in increased efficiency and will enable the closure of the Marsa power station. The Renewable Energy Policy sets a target of 10% renewable energy share in gross energy consumption for Malta by 2020. Government in recent years has launched various schemes to promote energy efficiency and renewable energy, primarily by subsidising the purchasing of roof thermal insulation, double glazing, solar water heaters and photovoltaic panels.⁷ The Malta Resources Authority has also set a favourable feed-in tariff available to both the residential and non-residential sectors generating electricity from photovoltaic panels. Together with other measures aimed to address commitments related to energy savings and greenhouse gas emissions,⁸ these investments should contribute to improved air quality over the next few years.

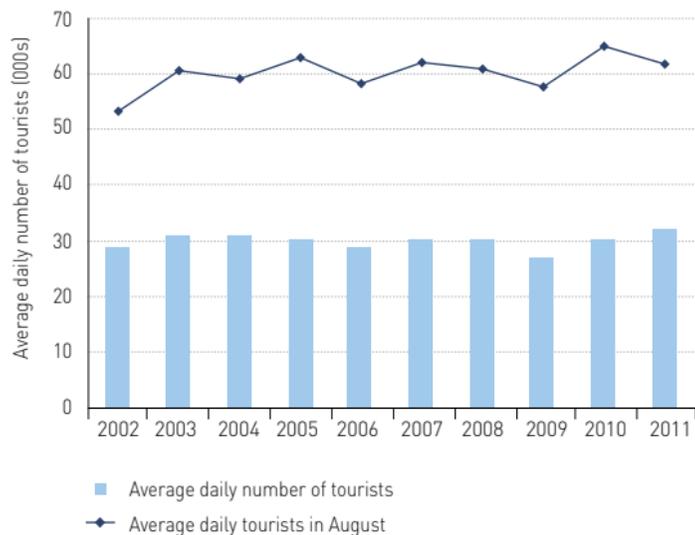


Source: Enemalta Corporation

DF6 DAILY NUMBER OF TOURISTS

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

Tourism plays an important role in the Maltese economy, however it results in additional pressures on the environment in terms of electricity and water consumption, waste generation, land take-up and pressure on ecologically-sensitive areas. These pressures can become unsustainable if not properly managed. In 2011 tourist numbers increased by 5.6%, to 1.4 million, while total bed-nights increased by 4.8%. The average daily number of tourists also went up by 4.8%, reaching an average of 32,000 tourists per day in 2011. At the same time, between 2010 and 2011, the number of departing tourists in August fell by 1.9% to 191,583, while daily tourists in August decreased by 5.1%, to 61,769. Tourist presence in August is relevant because achieving a more even distribution of tourists throughout the year would help to alleviate seasonal pressures on environmental resources. During this period Government continued to pursue a segment-based marketing strategy, seeking to optimise winter month capacity, with the result that during 2011, almost all months registered growth compared to the previous year. In 2011, foreign students attending English-language specialised schools decreased by 4.7% to 69,297, after an increase of 5.5% in 2010. These students represented 4.9% of total tourists in 2011 (down from 5.4% in 2010), with half of them (50.1%) visiting in summer, similar to 2010.⁹ Cruise-liner calls increased by 13.1%, up by 36 calls to 311 in 2011, while passengers increased by 13.3%.¹⁰ In parallel the winter sun segment grew by 10.3% over 2010, and growth rates were also registered for the culture and heritage, and conference and incentive segments, which focus on the non-peak season.



Source: NSO

KEY FACTS

AIR

NATIONAL ANNUAL AVERAGE **SULPHUR DIOXIDE** CONCENTRATIONS DECREASED BY 5.8% IN 2010 REMAINING WELL BELOW THE EU CRITICAL LEVEL.

AVERAGE ANNUAL CONCENTRATIONS OF **BENZENE** DECLINED BY 32.5% BETWEEN 2008 AND 2010, FROM $2.3\mu\text{g}/\text{m}^3$ TO $1.6\mu\text{g}/\text{m}^3$, REFLECTING THE DECLINE IN BENZENE LEVELS IN ALMOST ALL LOCALITIES, WITH THE GREATEST DECREASE RECORDED IN LIJA [52% BETWEEN 2008 AND 2010].

MALTA EXPERIENCED HIGHER LEVELS OF **PARTICULATE MATTER** IN 2010, AND EU STANDARDS WERE EXCEEDED IN MSIDA, WHICH IS THE SITE MOST DOMINATED BY TRAFFIC.

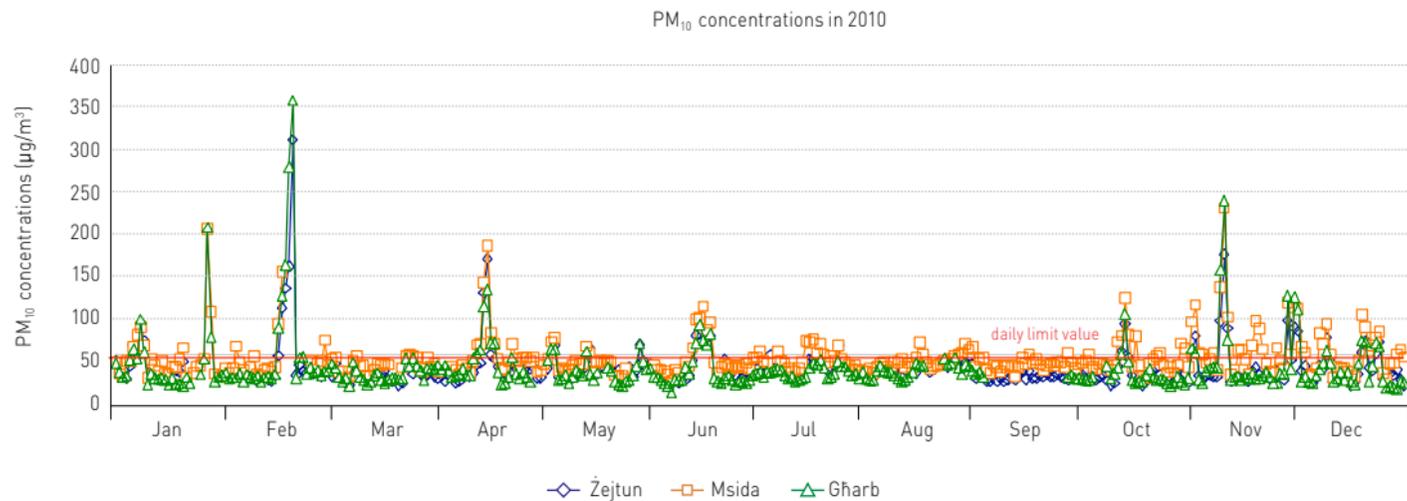
ANNUAL AVERAGE **NITROGEN DIOXIDE** CONCENTRATIONS DECREASED FROM $28.1\mu\text{g}/\text{m}^3$ TO $26.3\mu\text{g}/\text{m}^3$, REMAINING WELL BELOW THE EU AND WHO LIMIT VALUE IN 2010, HOWEVER 18 OUT OF 131 INDIVIDUAL SITES MEASURED REGISTERED LEVELS HIGHER THAN THE LIMIT VALUE.

ANNUAL AVERAGE **OZONE** CONCENTRATIONS INCREASED MARGINALLY FROM $102.8\mu\text{g}/\text{m}^3$ TO $102.9\mu\text{g}/\text{m}^3$ IN 2010. RESULTS IN RELATION TO THE 8-HOUR LIMIT VALUE SHOW THAT EU STANDARDS WERE EXCEEDED IN GHARB, BUT NOT IN ŻEJTUN AND MSIDA. OZONE IN MALTA COMES MAINLY FROM TRANSBOUNDARY SOURCES.



A1 PARTICULATE MATTER CONCENTRATIONS

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



Source: MEPA

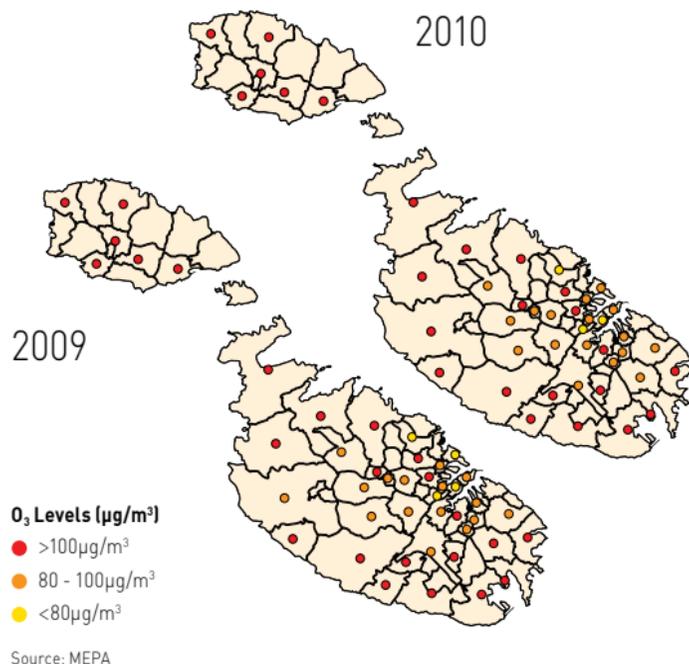
Particulate matter (PM) consists of very small suspended solid or liquid particles, which have short- and long-term effects on health: from general ill-health to respiratory problems such as asthma, as well as cardiovascular effects.¹¹ PM originates mainly from fuel combustion in transport and power generation, quarrying and construction dust, mechanically-generated dust, tyre and brake abrasion, and aerosols of transboundary origin, but it also includes dust from natural sources such as atmospheric sea salt and wind-blown dust (both local and transported, e.g. from the Sahara). In 2010 Malta's real-time monitoring stations recorded high levels of PM_{10} ,¹² although they are partly from natural sources, which may be deducted in computing final EU reporting figures, and thus compliance with EU standards. The EU daily limit value of $50\mu\text{g}/\text{m}^3$ should not be exceeded more than 35 times a year (approximately 10% of days measured). In 2010, at Msida, which is the site most dominated by traffic, the limit value was exceeded on 80 out of 340 days measured (23.5% of days measured). Following

deduction of natural sources, Msida was left with 37 exceedances (or 11%) of days measured. In 2009, Msida had registered exceedances on 57 days or 18% of days measured, but 35 days when natural sources were deducted. At Għarb the threshold was exceeded on 39 out of 326 days (12% of days measured) in 2010, and the highest concentration for 2010, of $366\mu\text{g}/\text{m}^3$, was recorded in this locality. Following deductions of natural sources, it emerged that all but one of the exceedances at this station were due to natural sources. In 2009, Għarb had registered 15 exceedances. The urban site in Żejtun recorded exceedances on 33 or 10.2% of the days measured. In 2009, there were 22 exceedances at this site. $PM_{2.5}$ are considered particularly harmful due to their ability to penetrate deeper into the lungs.¹³ The EU annual average limit value for $PM_{2.5}$ is $25\mu\text{g}/\text{m}^3$, to be attained by 2015. In 2010 the highest $PM_{2.5}$ value was recorded at Msida, at $20\mu\text{g}/\text{m}^3$, decreasing by 11% from 2009, while during the same period at Għarb there was a 37% decrease in $PM_{2.5}$, down to $11.3\mu\text{g}/\text{m}^3$.

A2 OZONE CONCENTRATIONS

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

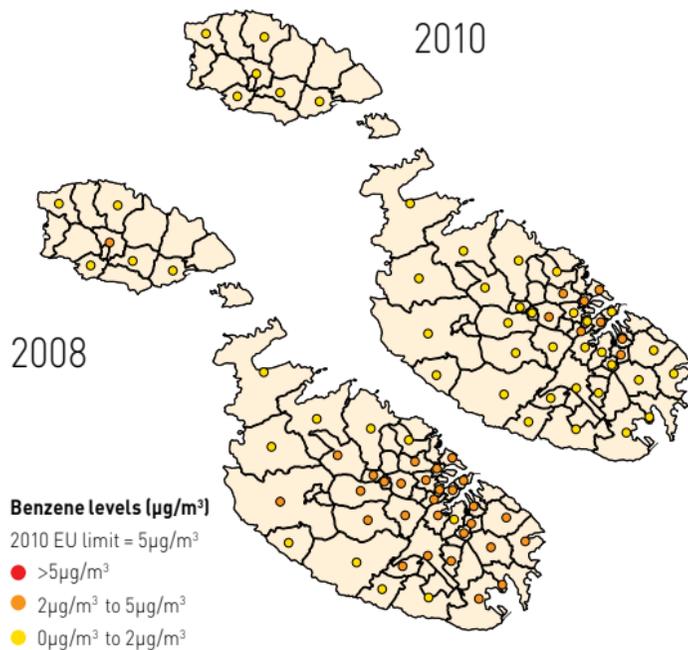
Ozone (O_3) is formed from the reaction of nitrogen oxides and volatile organic compounds emitted from traffic and power generation emissions in the presence of sunlight.¹⁴ However the majority of O_3 affecting Malta is of transboundary origin.¹⁵ O_3 is a harmful pollutant at ground level since it causes respiratory and cardiovascular health problems, and damages plants.¹⁶ 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 limit 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, which should never be exceeded.¹⁷ In 2010, the 8-hour limit value was exceeded on 37 out of 335 of days measured in Għarb, while exceedances were recorded on 3 out of 357 days measured in Żejtun. No exceedances were recorded in Msida. In 2010, national annual average concentrations over the diffusion tube network showed a marginal increase from $102.8\mu\text{g}/\text{m}^3$ to $102.9\mu\text{g}/\text{m}^3$. However, EU limit values have not been set for annual average O_3 concentrations, hence these values can only provide an indication about the trend. The highest O_3 concentrations continued to be recorded in rural localities less affected by traffic, with Għarb in Gozo again registering the highest annual average concentration ($136.5\mu\text{g}/\text{m}^3$).¹⁸ With respect to individual sites, readings at Għarb registered the highest annual average O_3 concentration ($155.2\mu\text{g}/\text{m}^3$) in 2010. The number of sites with an annual average concentration exceeding $100\mu\text{g}/\text{m}^3$ decreased slightly from 75 out of 131 sites in 2009 to 73 out of 131 sites in 2010.



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 that cause respiratory irritations and other genetic and nervous disorders, depending on various factors such as length of exposure. They are either emitted due to incomplete and inefficient combustion,¹⁹ or evaporate directly into the atmosphere. They are present in many products containing solvents, such as paints, varnishes, cleansers, disinfectants and automotive products.²⁰ VOCs are also ozone precursors.²¹ MEPA monitors the VOCs known as Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) using 131 diffusion tubes in 44 localities, as well as through automatic analysers at Msida, Żejtun and Gharb. Benzene is mainly a result of incomplete combustion of petrol.²² It is carcinogenic and mutagenic²³ and is considered to be harmful in any dose.²⁴ Average annual concentrations of benzene declined by 32.5% between 2008 and 2010,²⁵ from $2.3\mu\text{g}/\text{m}^3$ to $1.6\mu\text{g}/\text{m}^3$, reflecting the decline in benzene levels in almost all localities, with the greatest decrease recorded in Lija [52% between 2008 and 2010]. This decline is most likely due to lower benzene content in imported gasoline. Similar to previous years, in 2010 no locality average exceeded the EU limit value of $5\mu\text{g}/\text{m}^3$ (not to be exceeded by 2010), and the lowest benzene concentration, of $0.9\mu\text{g}/\text{m}^3$, was recorded in Dingli. The highest benzene concentration was recorded at Valley Road, Birkirkara [$4.5\mu\text{g}/\text{m}^3$], decreasing slightly from $4.6\mu\text{g}/\text{m}^3$ in 2008. Toluene, ethylbenzene and xylenes are monitored due to



Source: MEPA

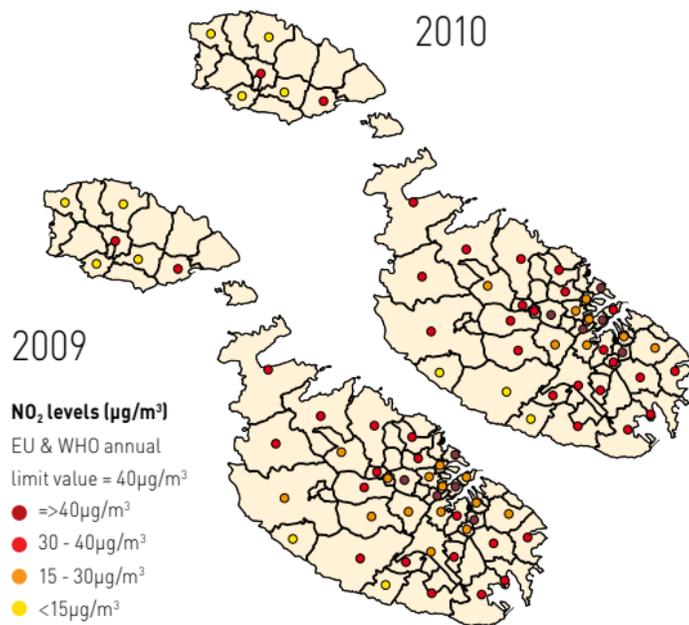
their potential to form ozone. Annual average ambient concentrations of the solvent toluene decreased by 54.5% from $16.1\mu\text{g}/\text{m}^3$ in 2008 to $7.3\mu\text{g}/\text{m}^3$ in 2010. No recommended limits are available for ethylbenzene and xylene. The annual ambient concentration of ethylbenzene in 2010 was $2.2\mu\text{g}/\text{m}^3$, compared to

$3.6\mu\text{g}/\text{m}^3$ in 2008, while annual ambient concentrations of mp-xylene and o-xylene were $6.5\mu\text{g}/\text{m}^3$ and $2.2\mu\text{g}/\text{m}^3$ respectively in 2010, down from the $9.7\mu\text{g}/\text{m}^3$ and $3.9\mu\text{g}/\text{m}^3$ concentrations in 2008. The reduced annual ambient concentrations of the above pollutants are also possibly linked to lower concentrations in imported gasoline.

A4 NITROGEN DIOXIDE CONCENTRATIONS

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

Nitrogen dioxide (NO_2) has adverse effects on health, since high concentrations of this gas cause inflammation of the airways and reduced lung function.²⁶ Nitrogen dioxide forms acids on contact with water vapour, as well as nitrates and other harmful compounds on interaction with other particles.²⁷ NO_2 is a direct result of fossil combustion,²⁸ and to a lesser extent a result of natural sources such as lightning. It is principally generated through energy generation and road transport, as its presence in urban centres illustrates. Further chemical reactions lead to the formation of nitrate particles and NO_2 is one of the most important sources of very fine particles such as $\text{PM}_{2.5}$. Between 2009 and 2010 the annual average national NO_2 concentration decreased from $28.1\mu\text{g}/\text{m}^3$ to $26.3\mu\text{g}/\text{m}^3$, remaining well below the $40\mu\text{g}/\text{m}^3$ EU and WHO limit value. As in 2009, in 2010 annual average values exceeded annual EU standards in 5 localities: Floriana ($55.2\mu\text{g}/\text{m}^3$); Hamrun ($46.4\mu\text{g}/\text{m}^3$); Fgura ($46\mu\text{g}/\text{m}^3$); Sliema ($41.4\mu\text{g}/\text{m}^3$); and, Birkirkara ($40.9\mu\text{g}/\text{m}^3$). In addition, 18 individual sites registered NO_2 levels higher than the EU and WHO limit, down from 22 sites in 2009, with Valley Road recording the highest value (82.4). In the same year, the hourly limit value (not to be exceeded for more than 18 hours per year) was exceeded once at Kordin and 18 times in Msida.

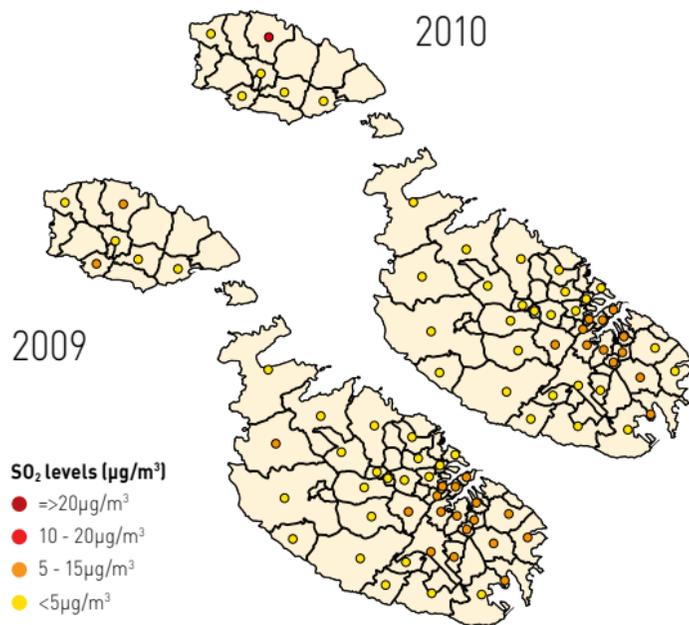


Source: MEPA

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 lung function. It damages aquatic ecosystems, soils, vegetation and limestone buildings. SO_2 is emitted through the burning of sulphur-containing fuels, including biofuels, mainly in power stations and transport, as well through natural sources, mainly volcanoes.²⁹ Sulphate also combines with other atmospheric compounds to become particulate matter and is therefore an important source for ultra fine particles such as $\text{PM}_{2.5}$.³⁰ SO_2 pollution from international shipping is a matter of increasing concern. National annual average SO_2 concentrations decreased by 5.8% in 2010 (from $5.1\mu\text{g}/\text{m}^3$ to $4.8\mu\text{g}/\text{m}^3$) remaining well below the EU critical level for the protection of vegetation ($20\mu\text{g}/\text{m}^3$). This decrease may be in line with the 2.5% decrease in electricity generation in this period.³¹ No annual limit value is defined for the protection of human health from SO_2 . Locality averages were all found to be below the EU limit value for the protection of vegetation, and decreases were registered in most localities. Similar to the previous year, the highest levels were recorded in Marsalforn³² ($15.4\mu\text{g}/\text{m}^3$), followed by Paola ($12.3\mu\text{g}/\text{m}^3$) and Fgura ($10.7\mu\text{g}/\text{m}^3$). Once again, Victoria in Gozo registered the lowest SO_2 concentration in 2010 at $2\mu\text{g}/\text{m}^3$, although it increased slightly from $1.9\mu\text{g}/\text{m}^3$ in 2009. In 2010 the daily average limit value was exceeded once at Kordin, while the hourly limit value was exceeded once at Kordin and once at Msida.



Source: MEPA

KEY FACTS

CLIMATE CHANGE

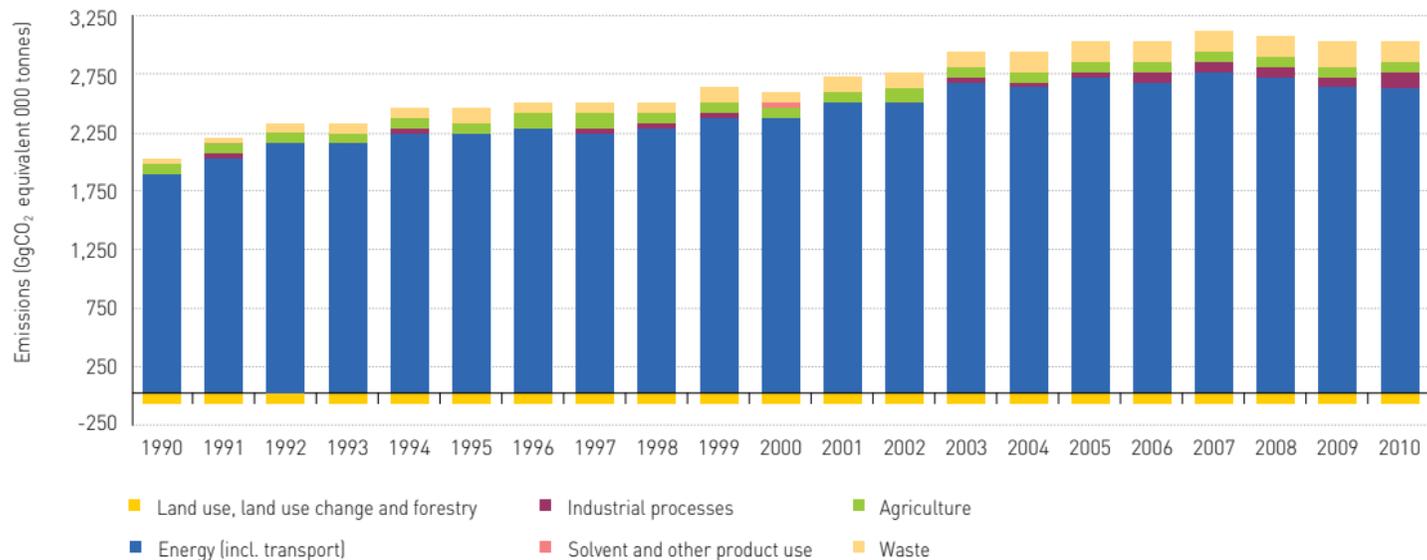
MALTA'S ESTIMATED **GHG EMISSIONS** HAVE BEEN RELATIVELY STABLE FOR THE LAST 5 YEARS, DESPITE AN OVERALL INCREASE OF 49% BETWEEN 1990 AND 2010. ALMOST 90% OF THE 2010 EMISSIONS COME FROM THE ENERGY SECTOR (INCLUDING TRANSPORT).

ENERGY INTENSITY, WHICH IS A MEASURE OF THE ENERGY USED TO CREATE A UNIT OF ECONOMIC WEALTH, DECREASED TO 174.5 KGOE/€000 IN 2011, IN LINE WITH THE OVERALL TREND SINCE 2001.



CC1 GREENHOUSE GAS EMISSIONS BY SECTOR

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



Source: MRA

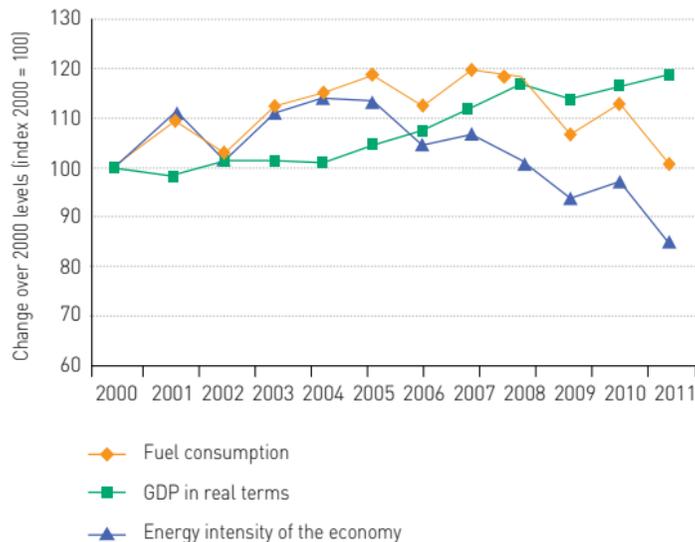
Climate change is considered to be one of the most serious environmental issues facing the global community. Climate change is attributed to a process whereby Greenhouse Gases (GHGs), produced by human activities, trap heat radiating from the Earth's surface and raise global temperatures. As a small island Malta is considered to be vulnerable to climate change. Between 1990 and 2010 there was an overall increase of 49.1% in Malta's GHG emissions, although instances of decreasing emissions were observed between 2003-2004 and 2007-2009. In line with the trend, in 2010 87.5% of total emissions derived from the energy sector (including transport). The next largest contributors to Malta's GHG emissions were waste (6.6%), and agriculture and industrial processes, together with the solvent and other product use sectors. The United Nations Framework Convention on Climate Change (UNFCCC) 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 2.0% of emissions in 2010. Between 1990 and 2010, emissions per capita, which are correlated to primary energy consumption per capita and the energy mix of the country,³³ increased by 29.2%, to 7.3 tonnes per capita in 2010, while in EU-27 per capita emissions decreased by 20.5% to 9.4 tonnes per capita in 2010. During the same period, Malta's emissions per unit GDP, which reflect the emissions intensity of a country in terms of its energy efficiency, its overall economic structure and the carbon content of the energy consumed in the country,³⁴ decreased by almost 63.4%, to 492Gg per billion Euro at constant 2000 prices in 2010. This may reflect a degree of decoupling of emissions from economic development over the whole time period.³⁵ In the EU-27, emissions per unit GDP declined by 38.8% to 450Gg per billion Euro at constant 2000 prices over the same time period.³⁶

CC2 ENERGY INTENSITY OF THE ECONOMY

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

Energy intensity is the ratio between gross inland consumption of energy and GDP at constant prices.³⁷ It is a measure of the energy used to create a unit of economic wealth, as well as the overall energy efficiency of a nation's economy. Almost all Malta's energy needs, including electricity generation and transportation, depend on fossil fuel imports. In Malta's case, net fossil fuel imports³⁸ are used as a proxy for gross inland consumption of energy,³⁹ since these fuel imports are consumed in Malta. As the chart indicates, energy intensity decreased in 2011, from 200 kilograms of oil equivalent per €1,000 GDP (kgoe/€000) in 2010 to 174.5 kgoe/€000 in 2011. During the last decade an overall decrease in energy intensity has been recorded. Should this trend persist it may point towards a relative decoupling of energy consumption from economic activity in the longer term.



Source: NSO 2012a; NSO; MRA

KEY FACTS

LAND

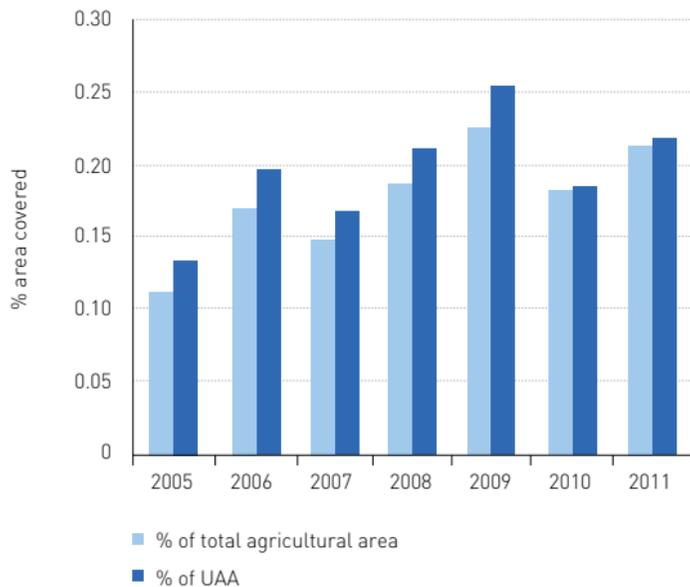
ORGANIC FARMING COVERED 0.21% OF TOTAL AGRICULTURAL LAND, INCREASING BY 3.7 HECTARES IN 2011.



L1 PERCENTAGE OF LAND COVERED BY ORGANIC FARMING

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

Organic farming may be defined as an agricultural system that aims to respect natural life-cycles during the production of food.⁴⁰ It contributes to a high level of biodiversity and the preservation of species and natural habitats, since it enhances soil life, natural soil fertility and water quality. Organic production also uses energy and natural resources responsibly, and promotes animal health and welfare.⁴¹ Between 2010 and 2011, the area of land cultivated using organic farming methods increased by 17.5%, covering 25ha of the Maltese Islands in 2011. This represented approximately 0.21% of total agricultural land and 0.22% of Utilised Agricultural Area (UAA). In 2011 there were 15 certified organic producers in the Maltese Islands. It is estimated that in 2011, 29.6% of the organically cultivated land was used for the production of fresh vegetables, melons and strawberries, 18.6% for growing grapes, and 11.2% for the cultivation of olives. In 2011, the area used for organically-cultivated olives increased by 17.2 percentage points to 2.8ha, while that used for grapes increased by 14.9 percentage points to 4.6ha.



Source: MRRA; MCCA; NSO 2006; NSO 2008; NSO 2012e

KEY FACTS

FRESH WATERS

BILLED WATER CONSUMPTION FROM THE WATER SERVICES CORPORATION INCREASED MARGINALLY BY 1.9% TO 15.6 MILLION M³ IN 2010.

NITRATE LEVELS EXCEEDED THE EU LIMIT VALUE OF 50MG/L IN 11 OUT OF 15 OF GROUNDWATER BODIES IN 2011.

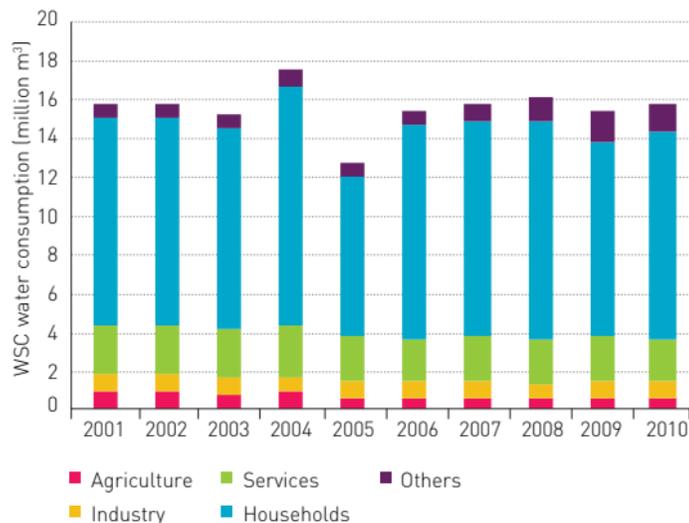
IN 2011 THE THRESHOLD VALUE FOR **CHLORIDES** WAS EXCEEDED IN 6 OUT OF 8 PERCHED GROUNDWATER BODIES AND IN ALL COASTAL AQUIFERS, WHILE IT WAS NOT EXCEEDED IN THE MEAN SEA LEVEL AQUIFERS.



W1 BILLED WATER CONSUMPTION BY SECTOR

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

In the Maltese Islands, the Water Services Corporation (WSC) is the main water provider, supplying freshwater through the municipal distribution network. This water originates from groundwater abstracted from the aquifers and from desalinated water produced in the 3 reverse osmosis plants present on the Islands. In 2010 billed water consumption from the WSC increased marginally by 1.9% to 15.6 million m³. As indicated in the chart, the main water consuming sector in 2010 was the households sector, with a share of 68.7% of total billed consumption.⁴² The services sector (comprising Government and the tourism and commercial sectors), with 14.1% utilisation rate, was the second major consumer of billed water. In 2010 the agricultural and industrial sectors consumed 3.2% and 5.2% of total billed water respectively. Private water suppliers also provide fresh water from groundwater sources, but data regarding this type of consumption is not available.



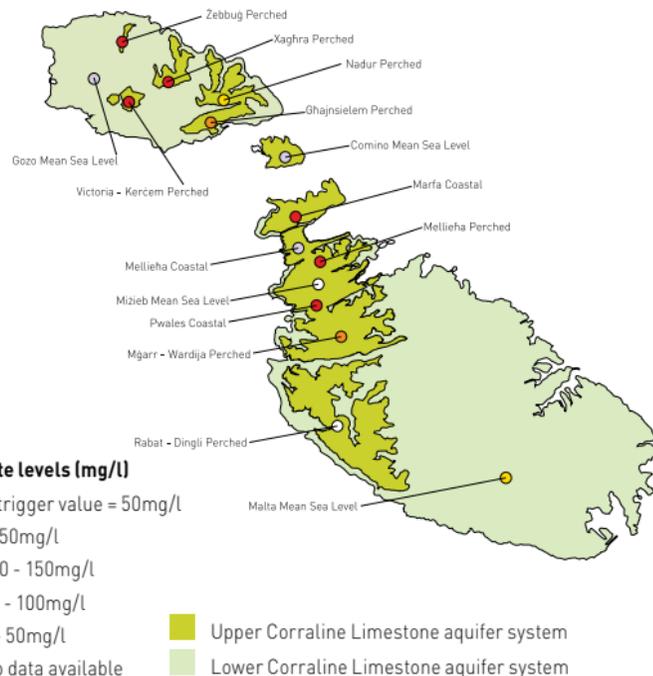
Source: WSC

Note: The above values refer to actual consumption, and do not include estimated consumption. This data is classified according to the WSC's coding system, which is different from the NACE (Statistical Classification of Economic Activities in the European Community) classification that was used for previous editions of this indicator.

W2 NITRATE LEVELS IN GROUNDWATER BODIES

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

Nitrates in groundwater result from anthropogenic activities, mainly the application of nitrate-rich fertilisers, which leach into the aquifer system. In 2011, nitrate levels exceeded the EU limit value of 50mg/l in 11 out of 15 of groundwater bodies.⁴³ In 2010 nitrates also exceeded the EU limit value in 11 out of 15 groundwater bodies. The highest nitrate concentration (488mg/l) was again recorded at Pwales coastal groundwater body, increasing by 28.9% since 2010. The highest value in the perched aquifer was recorded at Żebbug at 213.5mg/l. Nitrate concentrations in the mean sea level aquifer systems were also high. In 2011 the mean nitrate level at the Malta mean sea level groundwater body was 64.2mg/l, down from 70.2mg/l in 2010, and indicating that the nitrate levels in this aquifer are relatively stable. The mean level recorded at the Gozo mean sea level groundwater body decreased slightly to 47.5mg/l. In line with the Water Framework Directive (WFD), Malta is bound to achieve a 50mg/l limit value for nitrates by 2015.⁴⁴



Source: MRA

W3 CHLORIDE LEVELS IN GROUNDWATER BODIES

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

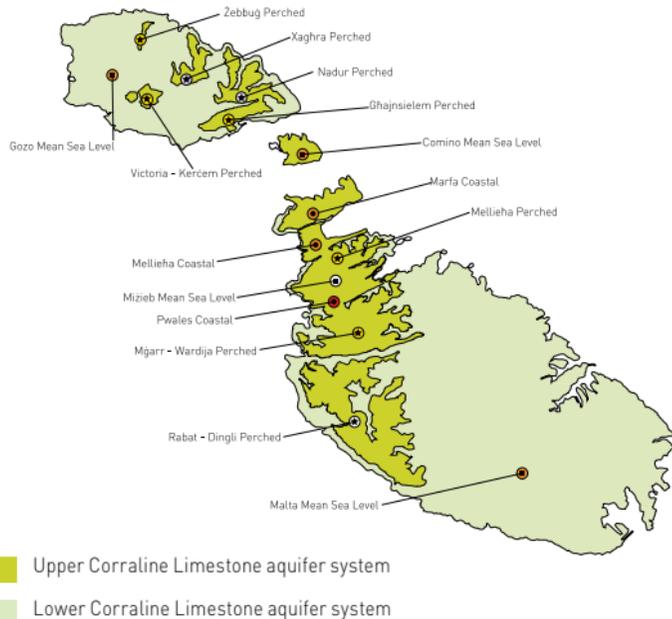
Chloride concentrations in groundwater result from sea-water intrusion, as well as over-abstraction. Chloride levels are measured against 3 separate threshold values, which were developed as part of the implementation process of the WFD, and which take into consideration parameters related to sea-water intrusion, anthropogenic pollution and geology. The threshold values are: 1000mg/l for mean sea level groundwater bodies, 500mg/l for coastal groundwater bodies, and 210mg/l for perched groundwater bodies. These threshold values also take into consideration specific 'use-requirements' (such as potable, irrigative, etc) as well as the natural background characteristics of each groundwater body. In 2011 the highest average chloride concentration was recorded at Pwales coastal aquifer (2,995mg/l), which registered a 28.4% increase since 2010. The lowest average concentration was recorded at the Nadur perched aquifer (91mg/l), where the average concentration also increased since 2010. During this period, 6 out of 8 perched groundwater bodies exceeded the threshold value, 1 more than in the previous year.⁴⁵ The limit value for the coastal aquifers was exceeded in all groundwater bodies, while the limit value for the mean sea level aquifers was not exceeded in any of them,⁴⁶ similar to 2010.

Chloride levels (mg/l)

- >1000mg/l
- 500 - 1000mg/l
- 210 - 500 mg/l
- 0 - 210mg/l
- No data available

Proposed threshold values and quality standards

- Mean Sea Level - 1000mg/l
- Coastal - 500mg/l
- ★ Perched - 210mg/l



Source: MRA

KEY FACTS

COASTAL AND MARINE ENVIRONMENT

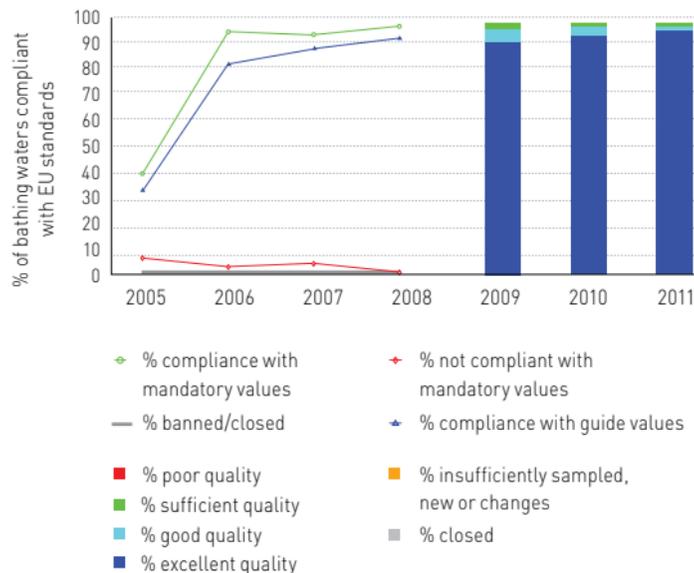
IN 2011, 85 OUT OF 87 **COASTAL BATHING SITES** WERE OF EXCELLENT QUALITY, UP FROM 83 SITES IN 2010.



CM1 BATHING WATER QUALITY

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

A high level of bathing water quality is essential for public health, the environment, as well as to support recreational and tourism-related activities. In this regard Malta is obliged to comply with standards under the EU Bathing Water Directive⁴⁷ and the Barcelona Convention.⁴⁸ Under the new EU Bathing Water Directive, bathing waters are classified on the basis of 2 microbiological parameters, and the results are expressed in terms of excellent, good, sufficient or poor quality, closed, new, insufficiently sampled or changes (bathing water where changes occur that affect the classification of bathing water). The results for 2011, based on 4 years' data (2008-2011), indicate that 97.7% of coastal bathing waters qualified as of excellent quality, while 1.1% were of good quality, and 1.1% was of sufficient quality.⁴⁹ As indicated in the chart, 2011 registered an improvement with regards to bathing sites of excellent quality, with 85 bathing sites classified as excellent, compared to 83 in 2010. In 2011, similar to the previous year, 1 bathing site was classified as good, while 1 bathing site was classified as sufficient when compared to 2 in 2010. Bathing water under the Barcelona Convention is classified as excellent, good, sufficient or poor, and in 2011, all 87 bathing sites classified as excellent⁵⁰ under this Convention.



Source: EHD

KEY FACTS

RESOURCES AND WASTE

WASTE GENERATED INCREASED BY 48% TO 1.4 MILLION TONNES IN 2010, MAINLY DUE TO AN INCREASE IN CONSTRUCTION AND DEMOLITION WASTE.

IN 2010, 62.8% OF WASTE GENERATED WAS **LANDFILLED**, DOWN FROM 74.7% IN 2009.

MUNICIPAL WASTE GENERATED FELL BY 7% IN 2010.

IN 2010, 8% (12,982 TONNES) OF **BIODEGRADABLE MUNICIPAL WASTE** GENERATED WAS DIVERTED FROM LANDFILLS FOR RECYCLING.

FOLLOWING AN OVERALL DECREASING TREND SINCE 2004, **DOMESTIC MATERIAL CONSUMPTION**, WHICH INDICATES THE MATERIAL CONSUMED IN A NATIONAL ECONOMY, INCREASED BY 6.2% IN 2011.

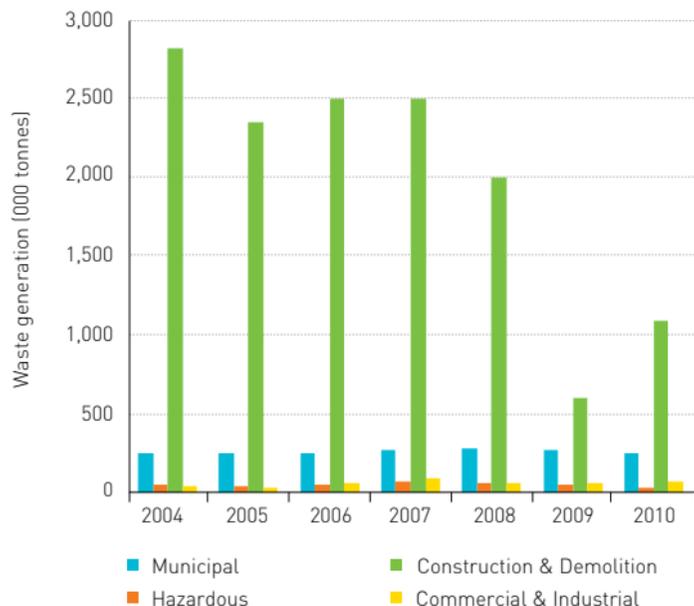


WS1 WASTE GENERATION

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

The generation of waste represents a loss of resources, and the management of waste places pressure on the environment in terms of air and water quality, and land take-up. In line with the relevant EU regulation,⁵¹ waste is divided into 4 categories: municipal waste; hazardous waste; construction and demolition waste; and, commercial and industrial waste. Waste generation increased by 48%, to 1.4 million tonnes in 2010, mainly due to the fact that the construction and demolition waste fraction increased again after declining by 70% between 2008 and 2009. The share of municipal waste in Malta's total waste generated declined from 27.4% to 17.2% in 2010. The share of hazardous waste declined from 4.8% to 2.5% during the same period. As noted above, the share of construction and demolition waste, which had declined significantly between 2008 and 2009, rose to 75.5% in 2010, up from 61.5% the previous year. Overall, the decreasing trend in construction and demolition waste generated since 2004 has persisted. In 2010, the share of commercial and industrial waste fell to 4.8%, despite the fact that the amount increased by 7,375 tonnes, due to the rise in construction and demolition waste. In 2010 62.8% of waste generated was landfilled, down from 74.7% in 2009, while 10.3% was recycled⁵² (up slightly from 10.0% in 2009), and 1.0% was recovered.⁵³ The remaining waste was incinerated, stored or exported and some construction and demolition waste was disposed of at sea.

Note: 2009 data has been revised by NSO.

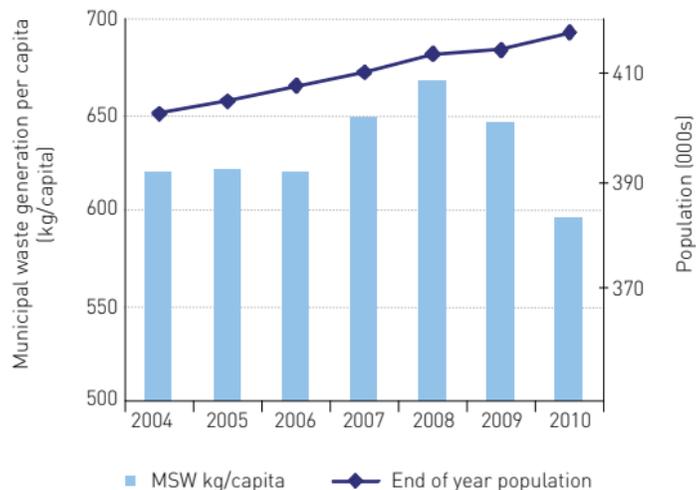


Source: NSO

WS2 MUNICIPAL WASTE GENERATED PER CAPITA

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

Municipal waste is mainly composed of waste collected from households, but also includes similar waste from sources such as commerce, offices, institutions and small businesses and municipal services (such as street cleaning).⁵⁴ This waste stream provides the best indicator for assessing performance in terms of generation and treatment of waste, due to its close relationship with consumption and GDP.⁵⁵ In 2010 municipal waste⁵⁶ generated fell once again, this time by 7.1% to 248,672 tonnes, most of which (81.1%) was landfilled,⁵⁷ while 7.7% was recycled, up from 4% in 2009, while 6% was recovered. The recent decline in municipal waste generated in comparison with the increasing trend registered over the years may be due to the economic climate in 2009-2010. In 2010, each Maltese resident generated 595.5kg of municipal waste, 50.8kg less municipal waste per capita than in 2009,⁵⁸ but still relatively high in comparison with the EU average, which was 503kg per capita in 2010.⁵⁹



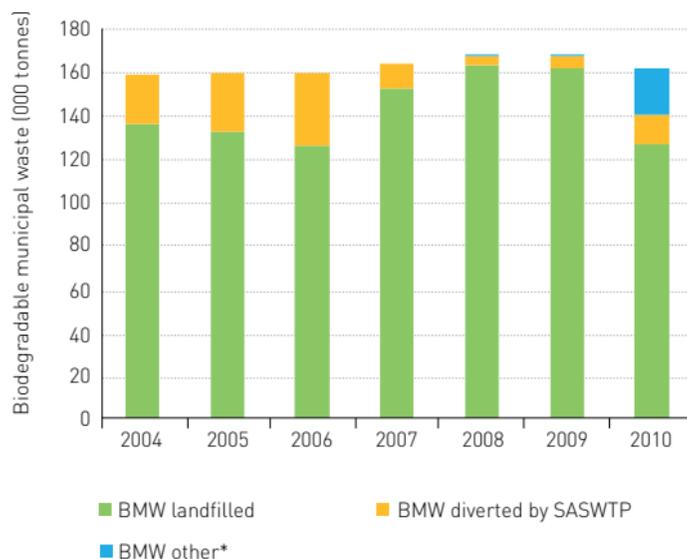
Note: 2009 figures for end of year population and municipal solid waste have been revised by NSO.

Source: NSO

WS3 BIODEGRADABLE MUNICIPAL WASTE LANDFILLED

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

Biodegradable waste includes any waste that is capable of decomposing, such as kitchen and garden waste, as well as paper and cardboard.⁶⁰ The Landfill Directive includes targets aimed at reducing the landfilling of biodegradable municipal waste, with a view to increasing the recycling rate for this type of waste.⁶¹ In 2010, 161,400 tonnes of biodegradable municipal waste were generated, 3.1 % less than in 2009. In 2010, 78.4% of biodegradable municipal waste generated was landfilled, while 8% (12,982 tonnes) was diverted from landfills for recycling through the Material Recovery Facility (MRF) at Sant' Antnin Solid Waste Treatment Plant. The remainder was stored for export or composted. The Sant Antnin Plant (SASWTP) was commissioned in two stages. The MRF receives recyclables from various sources including bring-in sites, the Recycle Tuesdays scheme and other sources, and first came into operation in February 2008. The Mechanical Biological Treatment Plant began to operate late in 2010 and is responsible for the treatment of mixed MSW to generate biogas, which is converted to electricity, and digestate. Together, 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.



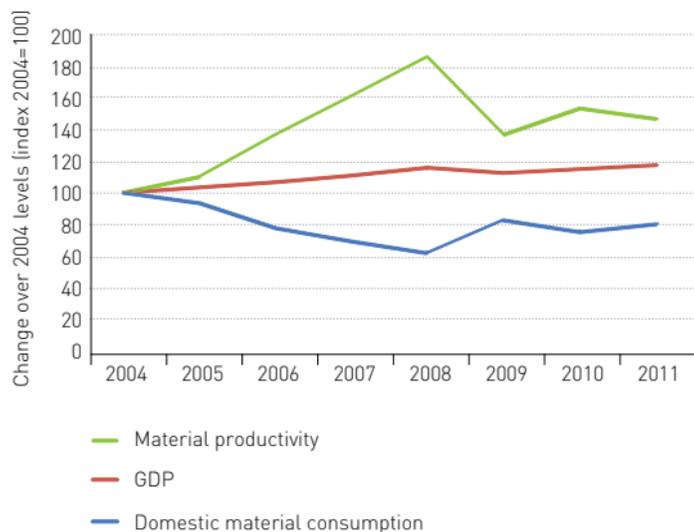
* stored for export or composted.

Source: MEPA

WS4 DOMESTIC MATERIAL CONSUMPTION

 **Key policy question:** What is the trend in domestic material consumption in Malta?

Domestic Material Consumption (DMC) is used as an indicator to estimate the total amount of material directly used in an economy.⁶² It provides an assessment of the absolute level of the use of resources,⁶³ and is calculated on the basis of the sum of total national extraction of minerals (estimated), biomass, and imports less exports. Overall DMC increased 6.2% between 2010 and 2011, resulting from increased imports and exports, although overall the trend indicates a decline. On the other hand domestic extraction⁶⁴ fell by 8.8% during this period due to lower levels of mineral extraction. Between 2010 and 2011 the mass of imports used in Malta's economy increased by 27.6%, mainly due to a 44.2% increase in fossil fuel imports in 2011. During this period material productivity, declined by 3.9%, indicating less material efficiency. Material productivity is calculated by dividing GDP in real terms by DMC, and provides an indication of how efficient the economy is in terms of use of the material resources.



Source: MEPA; NSO; NSO 2012a

KEY FACTS

BIODIVERSITY

TOTAL **PROTECTED AREAS** IN MALTA REACHED 67.6KM² OR 21.5% OF THE ISLANDS' LAND AREA IN 2011.

IN 2011, THE NUMBER OF MALTA'S **MARINE PROTECTED AREAS** INCREASED FROM 2 TO 5, SUCH THAT TOTAL PROTECTED MARINE AREA INCREASED FROM 10.8KM² TO 190.8KM² IN THAT YEAR.

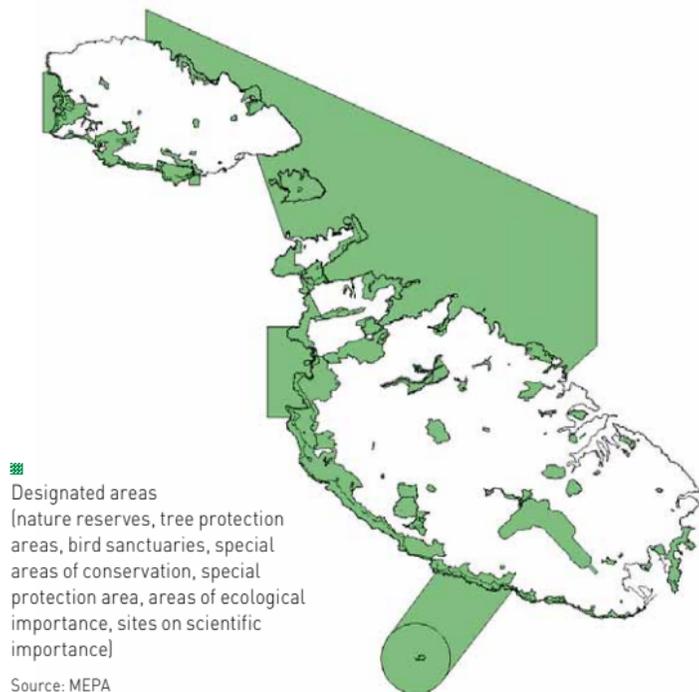
IN 2011, 13.1% OF **MALTA'S LAND AREA** FORMED PART OF THE EU'S NATURA 2000 PROTECTED AREAS NETWORK.



B1 NATURAL AREAS DESIGNATED

 **Key policy question:** What are the trends related to designation of natural areas?

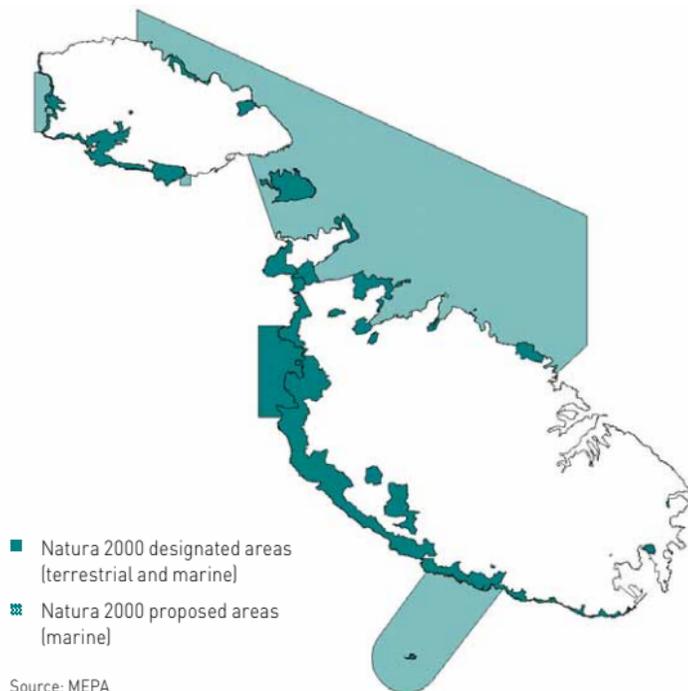
Malta protects its important habitats through the designation of Special Areas of Conservation (SACs) in line with the EC Habitats Directive⁶⁵ and Special Protection Areas (SPAs) in line with the EC Birds Directive.⁶⁶ In 2011, 3 additional marine SACs were designated (and 1 marine site was changed from national to international importance), such that Malta had a total of 39⁶⁷ SACs (including 5 marine areas), 32 of international and 7 of national importance, by the end of that year. The 5 marine SACs, which are all of international importance, covered 190.8km² of territorial waters in 2011, up from 10.8km² in 2010. As at end 2011, terrestrial SACs covered 42 km² or 13.3% of land area. By end 2011, there were 13 SPAs covering 16.5km² or 5.2% of land area. Furthermore, in 2011, 3 more Areas of Ecological Importance and Sites of Scientific Importance were scheduled, bringing the total to 73. In these areas specific policies guide the type of development that can take place. In 2011, the boundaries for 30 tree protection areas were published, covering 5.35km², with the aim of enhancing protection of one of Malta's important ecosystems. Malta also has 3 Nature Reserves affording protection to islets, as well as 26 Bird Sanctuaries.⁶⁸ In addition, since 2007, all beaches and swimming areas in close proximity to urban areas or major roads, including 11 specifically named beaches, were afforded legal protection from hunting.⁶⁹ As of end 2011, the Maltese Islands had a total of 21.5% of land area under some form of legal protective designation.



B2 SITES PROPOSED OR DESIGNATED AS PART OF THE NATURA 2000 NETWORK

 **Key policy question:** Has there been an increase in sites proposed or designated to form part of the EU Natura 2000 Network?

The EU Natura 2000 Network is a network of protected sites across the EU, designated under the Habitats⁷⁰ and Birds⁷¹ Directives, which merit special conservation measures since they support habitats and species of community interest. This network is one of the tools used by the EU to assist with halting the loss of biodiversity. A number of areas in Malta have been designated as part of the EU Natura 2000 network. As of end 2011 Malta had 27 terrestrial sites covering 41.8km² or 13.1% of land area, and 1 marine area of 8.5km² forming part of the network. 4 additional marine sites were submitted to the European Commission in 2011 to form part of the Natura 2000 network, and are expected to form part of this network shortly. The 5 marine sites in all cover an area of 190.8km². Some amendments to selected terrestrial sites were also considered, which will lead to 13.3% of land area being covered once accepted. Sites designated in line with the obligations of the Birds Directive are referred to as SPAs, and by December 2011 Malta had designated 13 SPAs covering 16.5km² or 5.2% of land area,⁷² which are automatically Natura 2000 sites. In some cases the areas designated under the two Directives overlap.



Source: MEPA

KEY FACTS

POLICY RESPONSES

GOVERNMENT SPENT €132 MILLION ON THE ENVIRONMENT IN 2010, 30% MORE THAN IN 2009, AND EQUIVALENT TO 5% OF **GOVERNMENT SPENDING**.

IN THE 2010/11 SCHOLASTIC YEAR OVER 43,000 STUDENTS OR 77% OF STUDENTS FROM PRIMARY TO POST-SECONDARY SCHOOLS, PARTICIPATED IN THE **EKOSKOLA** PROGRAMME.

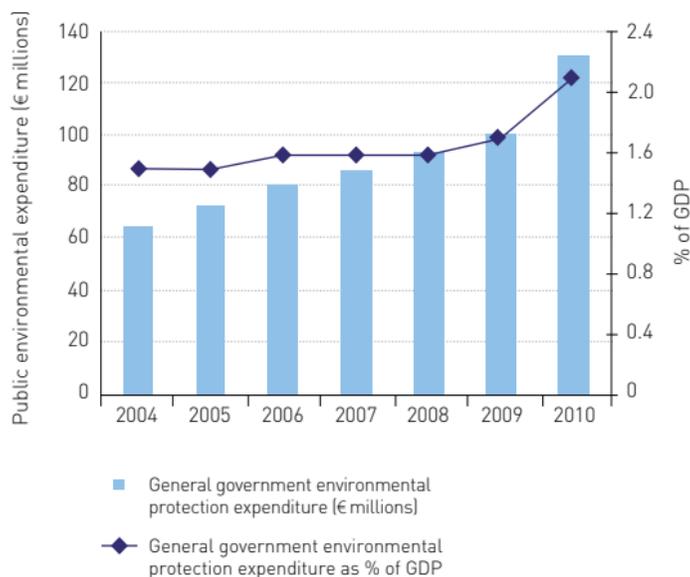
IN 2011, 11 OF THE 12 INSTALLATIONS REQUIRING AN **IPPC PERMIT** HAD BEEN PERMITTED, AND OVER 120 ENVIRONMENTAL PERMITS HAD BEEN ISSUED TO NON-IPPC SITES.



PR1 PUBLIC ENVIRONMENTAL EXPENDITURE

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

Public environmental expenditure provides an indication of Government's budget allocation towards addressing environmental issues. In 2010 Government spent €132 million on the environment (based on Eurostat's Classification of the Functions of Government), 30% more than in 2009 (€101.7 million). This expenditure represented 2.1% of GDP, up from 1.7% in 2009. In line with the trend over the previous years, most (79.4%) of the Government's environmental expenditure was related to solid and liquid waste management. The protection of biodiversity and landscape (this category includes MEPA's Environment Directorate expenses) absorbed 16.5% of environmental expenditure, while 2.9% went to environmental protection not elsewhere classified. The latter 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 5% of Government's spending in 2010, up from 4% in 2009, while 11% went to economic affairs, such as agriculture and transport, and 34.3% to social protection.

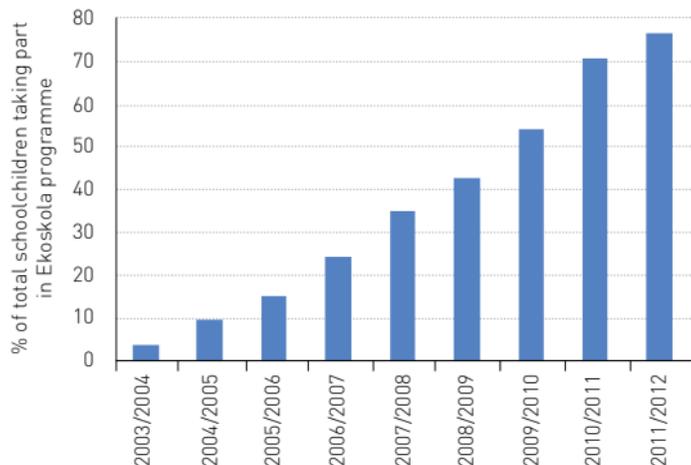


Source: NSO 2012f

PR2 STUDENTS PARTICIPATING IN EKOSKOLA PROGRAMME

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

EkoSkola is a voluntary environmental programme that seeks to develop environmental responsibility by adopting a whole school approach, incorporating environmental education principles within a school's management policy.⁷³ In the 2010/11 scholastic year over 43,000 students or 76.7% of students from primary to post-secondary schools participated in the EkoSkola programme, up from 70.6% in the previous scholastic year. During the 2010/11 scholastic year a total of 19 schools were awarded the Green Flag, indicating the school's commitment to fostering sustainable lifestyles, up from 11 schools in the previous scholastic year. Eco-Schools is an international programme for environmental management and certification that adopts a participative approach involving students at all stages. It aims at empowering students to take an active role in Local Agenda 21-related environmental decision-making and action within their school and community. The programme is coordinated by the non-governmental organisation Nature Trust (Malta).

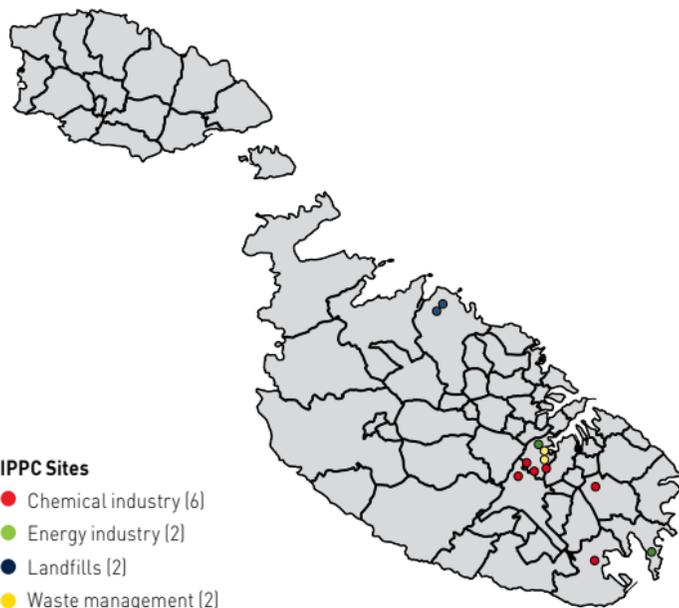


Source: Nature Trust (Malta)

PR 3 SITES REQUIRING INTEGRATED POLLUTION PREVENTION AND CONTROL PERMITS

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

Environmental permitting is an important tool for ensuring the achievement of environmental quality standards in particular operations. It ensures that certain types of activities 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 legislation⁷⁴ aim to minimise pollution from various point sources, while considering the whole environmental performance of the plant. Installations falling under this legislation are required to obtain an operational permit and must utilise the best available techniques in their operations. 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 2011, 11 of the 12 installations requiring an IPPC permit had been permitted, compared to 2010, when 10 of the 12 installations requiring a permit had been permitted.⁷⁵ Various types of operations require environmental permits, and the current list of IPPC installations includes operations in the chemical and energy sectors, and certain waste management facilities. In addition as of end 2011, over 120 environmental permits had been issued to non-IPPC sites such as waste management sites not requiring IPPC permits, manufacturing facilities, quarries, printing facilities and laundry/dry cleaning facilities, up from over 90 in 2010.⁷⁶



Source: MEPA

ENDNOTES

- 1 NSO 2011.
- 2 NSO.
- 3 NSO 2012b.
- 4 Public transport patronage figures for 2011 figures are not directly comparable to previous years due to the change in bus service which took place in July 2011.
- 5 MRA.
- 6 Enemalta Corporation.
- 7 Applications for capital grants for the installation of the first three technologies are still available.
- 8 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).
- 9 NSO 2012c.
- 10 NSO 2012d.
- 11 EEA 2010.
- 12 PM₁₀ refers to particles with an aerodynamic diameter smaller than 10mm while PM_{2.5} refers to particles of diameter smaller than 2.5mm, with the latter being the more dangerous for human health due to their deeper lung penetration.
- 13 EEA 2010.
- 14 EEA 2011a.
- 15 Nolle *et al* 2005.
- 16 EEA 2010.
- 17 The EU Air Quality Directive (2002/3/EC).
- 18 The reason for this is that O₃ in areas affected by traffic is removed through chemical reactions with pollutants from traffic. In addition, O₃ takes some time to form, and maximum O₃ concentrations can be observed in the plume some kilometres downwind of the source of precursor pollutants.
- 19 EC 2006.
- 20 <http://www.epa.gov/iaq/voc.html>, accessed on 6th March 2012.
- 21 See indicator on ozone.
- 22 EEA 2011a.
- 23 Permanently alter the genetic coding of a cell.
- 24 Nolle *et al* 2005.
- 25 2009 data is not available due to technical faults related to overexposure of samples.
- 26 EEA 2010.
- 27 WHO 2006.
- 28 EEA 2010.
- 29 EEA 2011a.
- 30 EEA 2011a.
- 31 NSO.
- 32 The diffusion tubes at Marsalforn are located close to a sewage pumping station, and emissions of hydrogen sulphide from this station may causing the high levels of SO₂ [Nolle *et al* 2005].
- 33 EEA 2011b.
- 34 EEA 2011b.
- 35 MRA.
- 36 http://www.eea.europa.eu/themes/climate/ghg-country-profiles/trends-and-projections-2011-cp/eu-27_tp2011_country_profile.pdf/view, accessed on 23rd March 2012.
- 37 For indicator definition please see <http://www.eea.europa.eu/data-and-maps/indicators/total-primary-energy-intensity> [accessed on 9th March 2012].
- 38 Amounts used refer to gross inland fuel consumption net of aviation and bunkering. Fuel stocks which are carried forward from one year to another are not deducted.
- 39 Data for gross inland consumption of energy is not currently available for Malta.
- 40 http://ec.europa.eu/agriculture/organic/organic-farming/what-organic_en, accessed on 22nd March 2012.
- 41 http://ec.europa.eu/agriculture/organic/organic-farming/what-organic_en, accessed on 22nd March 2012.
- 42 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.
- 43 Note that the Mizieb Mean Sea Level Station was off-line at the time of sampling and thus no data is available for 2011.
- 44 The implementation of the Nitrates Action Programme (2010) is a key measure in this regard.
- 45 Note that the Rabat-Dingli Perched Station was off-line at the time of sampling and thus no data is available for 2011.
- 46 Note that the Mizieb Mean Sea Level Station was off-line at the time of sampling and thus no data is available for 2011.
- 47 2006/7/EC.
- 48 Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean.
- 49 EEA 2012.
- 50 Based on intestinal enterococci results only.
- 51 Regulation (EC) No 2150/2002.
- 52 Waste reprocessed into products or substances whether for the original or other purposes.
- 53 Recovery refers to waste management operations

that result in certain products with a potential for economic or ecological benefit, such as energy recovery (re-use as a fuel) and biological recovery (e.g. composting) (<http://scp.eionet.europa.eu/definitions/recovery>, accessed on 17th April 2012).

54 <http://www.eea.europa.eu/data-and-maps/indicators/municipal-waste-generation/municipal-waste-generation-assessment-published-4#toc-0>, accessed on 8th March 2012.

55 EEA 2007.

56 Consisting of mixed municipal waste, street cleansing residues, bulky waste and mixed municipal waste.

57 NSO.

58 Municipal waste generation per capita is calculated by using end of year population figures.

59 http://epp.eurostat.ec.europa.eu/portal/page/portal/waste/data/sectors/municipal_waste, accessed on 5th March 2012.

60 <http://glossary.eea.europa.eu>, accessed on 9th March 2012.

61 EEA 2011c.

62 <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsdpc220>, accessed on 20th April 2012.

63 [http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:Domestic_material_consumption_\(DMC\)](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:Domestic_material_consumption_(DMC)), accessed on 20th April 2012.

64 Domestic extraction comprises the mass of material extraction associated with biomass, which includes items such as fish, crops, and mineral extraction.

65 92/43/EEC.

66 2009/147/EC

67 The coastal cliffs (Rdumijiet ta' Malta), which include 8 sites, are considered as 1 site, and thus the total number of SACs has been updated.

68 This figure includes the Addolorata Cemetery and San Anton gardens. Such protection is also afforded

to within 50 metres of any other cemetery in Malta and Gozo, as well as to all public gardens. For more information refer to Legal Notice 79 of 2006.

69 LN 79 of 2006, as amended by LN 39 of 2007.

70 92/43/EEC.

71 2009/147/EC.

72 Sites proposed as per the obligations of the Habitats Directive are evaluated by the European Commission prior to inclusion in the network, while sites selected as per the obligations of the Birds Directive are automatically considered as part of the Natura 2000 network upon submission.

73 <http://www.ekoskola.org.mt>, accessed on 1st March 2012.

74 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 Regulations, as amended.

75 For more information see <http://www.mepa.org.mt/ipcc-applications-installations>, accessed on 1st March 2012.

76 For more information see <http://www.mepa.org.mt/ep-installations>, accessed on 2nd May 2012.

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ACRONYMS

BMW	Biodegradable Municipal Waste
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
DMC	Domestic Material Consumption
EHD	Environmental Health Directorate
EU	European Union
GDP	Gross Domestic Product
GHG	Greenhouse Gases
IPPC	Integrated Pollution Prevention and Control
MCCAA	Malta Competition and Consumer Affairs Authority
MEPA	Malta Environment & Planning Authority
MRA	Malta Resources Authority
MRF	Material Recovery Facility
MRRA	Ministry for Rural Affairs and the Environment
MSW	Municipal Solid Waste
NACE	Statistical Classification of Economic Activities in the European Community

NO ₂	Nitrogen dioxide
NSO	National Statistics Office
O ₃	Ozone
PM	Particulate Matter
SACs	Special Areas of Conservation
SASWTP	Sant' Antnin Solid Waste Treatment Plant
SO ₂	Sulphur dioxide
SPAs	Special Protection Areas
UAA	Utilised Agricultural Area
UNFCCC	United Nations Convention on Climate Change
UoM	University of Malta
VOCs	Volatile Organic Compounds
WFD	Water Framework Directive
WHO	World Health Organisation
WSC	Water Services Corporation



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