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<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AD</td>
<td>Agriculture Directorate</td>
</tr>
<tr>
<td>ARPA</td>
<td>Agriculture and Rural Payments Agency</td>
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<tr>
<td>BCR</td>
<td>Benefit-Cost Ratio</td>
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<tr>
<td>CO</td>
<td>Carbon monoxide</td>
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<td>CO\textsubscript{2}</td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td>CoGAP</td>
<td>Code of Good Agricultural Practice</td>
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<tr>
<td>DCD</td>
<td>Diversification and Competitiveness Directorate</td>
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<tr>
<td>DS</td>
<td>Do-Something</td>
</tr>
<tr>
<td>EEA</td>
<td>European Environment Agency</td>
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<tr>
<td>EIRR</td>
<td>Economic Internal Rate of Return</td>
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<tr>
<td>EMEP</td>
<td>European Monitoring and Evaluation Programme</td>
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<tr>
<td>ENPV</td>
<td>Economic Net Present Value</td>
</tr>
<tr>
<td>ERA</td>
<td>Environment and Resources Authority</td>
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<tr>
<td>EU</td>
<td>European Union</td>
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<td>EWA</td>
<td>Energy and Water Agency</td>
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<tr>
<td>GAB</td>
<td>Governance of Agricultural Bio-resources Agency</td>
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<td>GAINS</td>
<td>The Greenhouse gas - Air pollution Interactions and Synergies model</td>
</tr>
<tr>
<td>GHG</td>
<td>Greenhouse Gases</td>
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<tr>
<td>HFO</td>
<td>Heavy Fuel Oil</td>
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<td>IED</td>
<td>Industrial Emissions Directive</td>
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<tr>
<td>ITS</td>
<td>Intelligent Transport System</td>
</tr>
<tr>
<td>kt</td>
<td>kilotonnes</td>
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<tr>
<td>LEZ</td>
<td>Low Emission Zones</td>
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<tr>
<td>LPG</td>
<td>Liquefied Petroleum Gas</td>
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<tr>
<td>LV</td>
<td>Light vehicle</td>
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<tr>
<td>MCP</td>
<td>Medium Combustion Plant</td>
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<tr>
<td>MEPA</td>
<td>Malta Environment and Planning Authority</td>
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<tr>
<td>MESDC</td>
<td>Ministry for the Environment, Sustainable Development and Climate Change</td>
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<tr>
<td>MNEP</td>
<td>Malta National Electro-mobility Platform</td>
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<td>MRA</td>
<td>Malta Resources Authority</td>
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<td>MW\textsubscript{th}</td>
<td>Megawatt thermal</td>
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<tr>
<td>NAPCP</td>
<td>National Air Pollution Control Programme</td>
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<td>NEC</td>
<td>National Emission Ceiling</td>
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<td>NECP</td>
<td>National Energy And Climate Plan</td>
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<td>NEEAP</td>
<td>National Energy Efficiency Action Plan</td>
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<tr>
<td>NH\textsubscript{3}</td>
<td>Ammonia</td>
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<tr>
<td>NMVOC</td>
<td>Non-methane volatile organic compound</td>
</tr>
<tr>
<td>NO\textsubscript{2}</td>
<td>Nitrogen dioxide</td>
</tr>
<tr>
<td>NO\textsubscript{x}</td>
<td>Nitrogen oxides</td>
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<tr>
<td>NSO</td>
<td>National Statistics Office</td>
</tr>
<tr>
<td>PM\textsubscript{10}</td>
<td>Particulate matter of less than 10µm aerodynamic diameter</td>
</tr>
<tr>
<td>PM\textsubscript{2.5}</td>
<td>Particulate matter of less than 2.5µm aerodynamic diameter</td>
</tr>
<tr>
<td>PT</td>
<td>Public transport</td>
</tr>
<tr>
<td>PTQC</td>
<td>Public Transit Quality Corridors</td>
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</tbody>
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R&I  Research and Innovation
RES  Renewable Energy Resources
SL   Subsidiary Legislation
SME  Small and Medium-sized Enterprises
SO₂  Sulphur dioxide
SOₓ  Sulphur oxides
SOER State of the Environment Report
SUMPs Sustainable Urban Mobility Plans
TEN-T Trans-European Transport Networks
TM   Transport Malta
VOC  Volatile organic compounds
WaM  With Additional Measures
WM   With Measures
1. **BACKGROUND**


The new National Emission Ceilings Directive, also referred to as the NEC Directive, is intended to guide Member States to further reduce air pollution and its associated risks to the environment and human health by establishing future anthropogenic emission reduction commitments for each Member State for the following pollutants:

- Nitrogen oxides (NO\textsubscript{x});
- Non-methane volatile organic compounds (NMVOC);
- Sulphur dioxide (SO\textsubscript{2});
- Ammonia (NH\textsubscript{3}); and
- Fine particulate matter (PM\textsubscript{2.5}) emissions.

Pursuant to Article 6 of the NEC Directive, every Member State must submit a National Air Pollution Control Programme (NAPCP) by 1 April 2019 and every four years thereafter. The NAPCP supports Member States in planning the national policies and measures with the aim of limiting the annual anthropogenic emissions of the five pollutants mentioned above, and which must reflect the national emission reduction commitments for 2020 and 2030. The NAPCP contributes in achieving air quality objectives and ensures coherence with other relevant plans and programmes including climate, energy, agriculture, industry and transport policy areas. Synergies between the NAPCP and the National Energy and Climate Plan (NECP) exist as they both rely, to a large extent, on the same measures and actions to reduce emissions.
2. EXECUTIVE SUMMARY

The NAPCP is the principal governance tool under Directive (EU) 2016/2284, supporting Member States to plan their national policies and measures with the aim of being compliant with the national emission reduction commitments, as laid down in Annex II of the same Directive for years 2020 and 2030.

In order to complete the NAPCP, historical emissions inventory data were used to assess the progress made so far with the implementation of policies and measures to date. Ambient air quality data was also assessed in this respect. In addition, emission projections were produced for two policy scenarios for the years 2020 and 2030: the “With Measures” or baseline scenario, whereby emissions are projected based on adopted policies and measures as of end 2017, and the “With Additional Measures” scenario, which reflects new policies and measures planned to be implemented in future years.

These emission projections were largely developed using the same models and activity drivers used by the Energy and Water Agency (EWA) for the development of the NECP reference and policy scenarios. This ensured synergies between the plans since they rely, to a large extent, on similar measures and actions. In addition, expert assistance was also provided through the capacity-building project on emission projections, funded by the European Commission. This capacity-building project specifically provided support in developing emission projections for the road transport and national navigation sectors.

The power generation sector was one of the major contributors to atmospheric emissions in Malta. Initially, Malta was dependent on heavy fuel oil (HFO) to generate electricity. The sulphur content of the fuel was gradually reduced, and eventually both power stations shifted to ultra-low sulphur fuels. In 2017, Malta shifted to natural gas to generate electricity, and closed the Marsa Power Station. A decrease in SO₂ annual mean concentrations in ambient air was observed between 2014 and 2017, and SO₂ total national emissions have decreased by about 94.7% between 2005 and 2017. Moreover, sourcing of electricity through the submarine interconnector also contributed to the decrease in emissions from power generation.

Although NOₓ emissions from power generation have decreased by 91% between 2005 and 2017, NOₓ emissions from the road transport sector have not reduced. While there are several sustainable measures that are being implemented in the road transport sector, this effort is masked by the daily increase in newly registered vehicles on the road, making this sector a major contributor to NOₓ emissions.

The NAPCP also outlines a number of measures which are planned to be implemented with the aim to reduce emissions of NEC pollutants by 2020 and 2030. These measures were
selected following a thorough review of related national plans, programmes and strategies which can affect the NEC Directive, and following consultations with all relevant stakeholders.

The measures included in the “With Measures” (WM) scenario consist of the use of cleaner fuels in the power generation and transport sector, the public transport reform, sustainable mobility measures, roadside checks and roadworthiness testing, grants and schemes in the road transport sector, energy efficiency grants and a number of good practice measures in the agricultural sector.

The measures included in the “With additional Measures” (WaM) scenario build on the WM scenario, with additional measures mostly focused on road transport. These include free school transport, the study related to the introduction of a low emission zone in the hub, additional sustainable mobility measures, electric buses in Gozo, road infrastructure measures, public transport quality corridors and the improvement of ferry landing places. The WaM scenario also includes measures in other sectors such as a permitting regime for emission sources not yet regulated by EU legislation, and a number of measures to control ammonia emissions from agriculture.

Notwithstanding the above mentioned measures, projected data for the WaM scenario shows that more effort needs to be employed for Malta to be able to reach its NO\textsubscript{X} ceiling for 2030.

Emission projections for SO\textsubscript{2}, NH\textsubscript{3} and PM\textsubscript{2.5} demonstrate compliance with 2020 and 2030 ceilings, while emission projections for NMVOC result in a non-compliance with the 2020 ceilings. Emission calculations for the sector related to ‘Domestic Solvent Use including Fungicides’ are estimated using a very basic methodology, possibly leading to an overestimation of NMVOC emissions, including projections. Therefore, projections for this sector are subject to further studies and verification.
3. **POLICY PRIORITIES AND THEIR RELATIONSHIP WITH OTHER POLICY AREAS**

### 3.1 Coherence in inventories and projections

Pursuant to Article 8 of the NEC Directive, every Member State must report annually a national emissions inventory for air pollutants, and must prepare national emission projections every two years. The national emissions inventory and projections are prepared through various consultations with the relevant authorities.

The inventories and projections are the basis on which such programmes are developed. In the previous round of reporting of the emissions inventory, ERA recalculated the data for years 2005 to 2017, using the latest guidebook, the ‘EMEP/EEA Air Pollutant Emission Inventory Guidebook 2016’ (EEA, 2016). Data sources and activity data used to calculate emissions for the inventory are consistent with those developed in related policy areas.

The activity data used to prepare the emissions inventory is acquired from the relevant authorities of the inventory sector concerned; for example, Enemalta provides activity data required to estimate emissions produced by public electricity. Other major data providers are Transport Malta (TM), National Statistics Office (NSO), Malta Resources Authority (MRA), the Agriculture Directorate (AD) and the Regulator for Energy and Water Services (REWS).

The same activity data was used to develop emission projections for years 2020, 2025 and 2030, based on models and activity drivers sourced from the Energy and Water Agency (EWA). Bilateral consultations were carried out with stakeholders that are currently implementing measures which are likely conducive to emission reduction. The measures that are currently being implemented are selected for the “WM” scenario of this programme. Measures included under this scenario are measures adopted and implemented as of end 2017. The “With additional Measures (WaM)” scenario features planned policies and measures post 2017, and represents Malta’s projected achievement once planned policies and measures are implemented.

Further consultations were carried out with the relevant stakeholders in order to discuss the measures that will likely lead in achieving compliance with the national emission reduction commitments as set out in Annex II of the NEC Directive.

### 3.2 Coordination with other reporting requirements

Given that a strong synergy exists between the NAPCP and the NECP, the ERA worked in close cooperation with the EWA, the national entity entrusted with the reporting of the NECP. The aim of the NECP is to set climate and energy objectives, targets, policies and measures to ensure that the Union’s 2030 targets for greenhouse gas emission reductions, renewable energy, energy efficiency and electricity interconnection are met\(^1\). The main difference

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between the NAPCP and the NECP is that these programmes target different pollutants. The NAPCP deals with atmospheric pollutants while the NECP’s main focus is climate action.

In the past round of reporting emission projections, ERA used the GAINS model. In the light of the need to ensure coherence with reporting under other obligations, ERA made use of the same assumptions and activity drivers used for the first draft submission of the NECP, as a basis to generate emission projections for most of the sectors. Updates in activity data performed by the Energy and Water Agency as a basis for the updated version of the NECP could not be considered in time for the reporting of this NAPCP, however the relevant updates will be carried out by the next reporting rounds. In addition, following the opportunity available through a capacity building project (as described in Section 2), ERA considered this project to be an excellent opportunity to improve its emission projections on a sectoral level, through the technical assistance of the relevant experts. This project provided support specifically in the national navigation and road transport sectors.
4. RESPONSIBILITIES ATTRIBUTED TO NATIONAL, REGIONAL AND LOCAL AUTHORITIES

The ERA is the national competent authority that takes the overall responsibility for the drafting of the NAPCP, in consultation with the relevant stakeholders. In terms of air quality, the ERA has the following responsibilities:

- The elaboration of and reporting of the NAPCP;
- The air emissions legislation;
- The ambient air quality legislation, which includes the assessment, monitoring, reporting on air quality and air pollution impacts, together with the reporting of the emissions inventory and projections;
- Regulates the environmental impact of the industrial sector through permitting systems;
- Enforces compliance with legislation;
- Regulates emissions from the industrial sector.

ERA falls under the responsibility of the Ministry for the Environment, Sustainable Development and Climate Change (MESDC).

Climate change policy falls under the responsibility of the MESDC. The Malta Resources Authority (MRA) is designated as the national inventory agency for the elaboration of annual national inventories of greenhouse gas emissions and removals. The Energy and Water Agency (EWA), within the portfolio of the Ministry for Energy and Water Management (MEW) is responsible for the preparation of National Energy and Climate Plans pursuant to the Energy Union Governance Regulation, under the auspices of an Inter-Ministerial Steering Committee. In this context, the EWA is also responsible for preparing projections for the energy sector, which are then converted to greenhouse gas emissions. The MRA is responsible for preparing projections of greenhouse gas emissions (and removals) for Industrial Processes, Agriculture, Land Use, Land-use Change and Forestry, and Waste. As already mentioned earlier, there is a close synergy between inventories and projections for GHG’s and for air pollutants, including in respect of activities for which emission estimations and projections are required. Therefore, ERA collaborates closely with MRA and EWA, so as to maximise and ensure coherence between reporting obligations.

Responsibility for sector-specific policy-making and policy implementation lies largely within the Ministries and government bodies responsible for the respective sectors.

Transport Malta (TM) is the authority responsible for the promotion and development of the transport sector in Malta, by means of proper regulation. TM aims to achieve modal shifts and improve the public transport system, amongst other objectives. Since the road transport sector is the most important key source category for NOx emissions in Malta, as clearly illustrated in Figure 15, most of the measures included in the NAPCP focus on the road transport. To this effect, the measures included in the National Transport Master Plan for 2025 were given due importance with a view to gauge the extent to which these measures will result in emission reduction. This Master Plan is a planning and implementation
document, with measures in the short to medium term duration. It aims to achieve the goals set by the National Transport Strategy, which creates the strategic framework by 2050. Furthermore, measures from the Malta National Electro-Mobility Action Plan (MNEAP) were also given due importance since the plan includes a number of measures targeting sustainable mobility. The MNEAP also seeks to promote a change in culture of the public’s perception on mobility and transportation in general. TM reports to the Ministry for Transport, Infrastructure and Capital Projects.

Since the NAPCP needs to include measures that are also reducing atmospheric pollutants resulting from the agricultural sector, discussions were held with the Agriculture Directorate (AD), the Diversification and Competitiveness Directorate (DCD), the Agriculture and Rural Payments Agency (ARPA) and the Governance of Agricultural Bio-resources Agency (GAB), to identify which measures have been implemented so far and that are likely to reduce relevant pollutants (mainly ammonia). The ARPA manages a Cross-Compliance Framework whereby farmers who are provided with subsidies are expected to implement a series of sustainable actions. The Cross-Compliance Framework brings together obligations arising from a number of Directives, which are enforced by the relevant competent authorities. The measures identified are considered in the baseline scenario (“WM” scenario).

The Diversification and Competitiveness Directorate (DCD) was also consulted on the agricultural measures included in the NAPCP. Farmers are shifting from traditional trends that are no longer relevant, and are seeking new opportunities. The DCD encourages farmers to diversify their products and find alternative ways to improve their income².

A number of measures arising from the National Agricultural Policy for the Maltese Islands (NAP) (2018-2028), prepared by the AD, could potentially reduce ammonia emissions and have therefore been considered in the “WaM” scenario.

The AD, the DCD, the GAB and the ARPA report to the MESDC.

5. PROGRESS MADE BY CURRENT POLICIES AND MEASURES IN REDUCING EMISSIONS AND IMPROVING AIR QUALITY

This Chapter outlines a list of policies and measures already implemented, and which were aimed to reduce emissions. Using ambient air quality and emissions data, the reductions in ambient concentrations and national emissions of related air pollutants are documented.

The ERA currently operates a fixed station network composed of four real-time air-monitoring stations: a traffic site in Msida, two urban background sites in Żejtun and Attard and a rural background site in Għarb, Gozo. In addition, work is ongoing to install a fixed monitoring station in the North of Malta, to act as a traffic site in the zone. The aim of this additional site is to better understand the effect of traffic outside the agglomeration. The stations cover all pollutants that require monitoring and reporting under the Ambient Air Quality Directive (2008/50/EC).

![REAL TIME AIR MONITORING STATIONS](image_url)

**Figure 1** Siting of the real time monitoring network
Real time monitoring is also complemented by a Passive Diffusion Tube network, which consists of 100 sites for VOCs and NO$_2$, and a smaller network for SO$_2$ (SOER, 2018).

![Figure 2 Locations covered by the diffusion tube network for NO$_2$ and VOCs](image)

In addition, the ERA annually compiles an emissions inventory as required by the NEC Directive and in accordance with the EMEP reporting guidelines and Guidebook, as described in Chapter 3.1.

As a result of the monitoring and inventorying of concentrations and emissions of pollutants respectively around the Maltese Islands, the sources and sectors where attention is required are identified and measures targeted at emissions reduction have been implemented in the past and recent years.

The energy sector is one of the major contributors to atmospheric emissions in the Maltese Islands, contributing mostly to NO$_x$, SO$_2$, NMVOC and PM$_{2.5}$ emissions. The energy sector includes public electricity, heat production, fuel combustion activities in industries and construction, transport and small-scale combustion. On the other hand, the agricultural sector contributes to NH$_3$ emissions.
Power generation

5.1 Shift to ultra-low sulphur fuel in power plants

Sulphur dioxide (SO\textsubscript{2}) derives from the combustion of fossil fuels containing sulphur and is a major air pollutant. When the fuels containing sulphur are burned (the sources of this pollutant being mainly the power generation and transport sectors), sulphur oxidises and forms sulphur dioxide (SO\textsubscript{2}). SO\textsubscript{2} is highly water soluble, and once it dissolves in rainwater, it becomes sulphuric acid, which produces acid rain (SOER, 2005). Acid rain damages the natural and the built environment as it corrodes limestone buildings, damages vegetation and distresses aquatic ecosystems. Additionally, SO\textsubscript{2} can cause several health problems when inhaled, such as aggravated asthma attacks, respiratory problems and irritation to the respiratory tract. SO\textsubscript{2} can also contribute to the formation of secondary pollutants such as particulate matter. Once particulate matter is inhaled, it can penetrate through the respiratory system especially the ultra-fine particles (PM\textsubscript{2.5}), which can cause respiratory problems such as asthma, cardiovascular diseases and lung cancer (WHO, 2018).

In the past years, Malta has relied completely on heavy fuel oil to generate electricity from the Marsa and Delimara Power Stations, operated by Enemalta Corporation. In 2004, about 88% of electricity in Malta was generated using heavy fuel oil having a sulphur content of 3.5%, while 12% of electricity was generated by gas turbines (in open and combined cycle modes), operated on gas oil (MEPA, 2006). However, the two power stations were not equipped with technologies (e.g. flue gas desulphurisation equipment) that reduced SO\textsubscript{2} emissions from their chimneys (EPD, 2002). In 2004, both power stations switched to low sulphur fuels, with a sulphur content of 1%. As a result, a drastic reduction in SO\textsubscript{2} concentrations was observed (MEPA, 2006), especially downwind of the Marsa Power Station, at Luqa, Figura, Żejtun, Gudja and Birżebbuġa (SOER, 2005). Throughout the years, the sulphur-containing fuels have been further refined to contain even less sulphur. Both the local air-monitoring network (Figure 3) and the NEC emission inventory (Figure 14) saw a considerable reduction in SO\textsubscript{2} levels.

Figure 3 shows data for the annual national average concentrations of SO\textsubscript{2}, sourced from the passive diffusion tube network (2000-2017). An annual average decrease of 0.92 µg/m\textsuperscript{3}, ranging from 1.6 to 0.54 µg/m\textsuperscript{3} per year, can be noticed. This can be attributed to the switch to low sulphur fuel in both power stations and to the reform in the power generation sector (as explained in Section 5.2). The annual average concentrations of SO\textsubscript{2} remained well below the level for the protection of vegetation (20 µg/m\textsuperscript{3}) as from 2004.
5.2 Reform in the power generation sector

Following a major reform of the energy system brought up by a government policy, Malta implemented the following measures in the power generation sector:

- Sourcing of electricity through the sub-marine interconnector. The project comprised the laying and operation of a 95km long, 200MW sub-marine interconnector cable between Malta and Sicily connecting Malta to the European-electricity network (OPM, Energy and Projects, 2017).
- Closure of the Marsa Power Station in March 2015.
- Decommissioning of the old generating units at the Delimara Power Station. The recently added plant in the Delimara Power Station was converted to run on natural gas instead of heavy fuel oil.
- As from 2017, Malta shifted to natural gas to generate electricity nationwide. This change has led to improved air quality and reduction in power generation costs.
As from 2015, the local fuel consumption decreased with the commissioning of the Malta-Sicily interconnector, with a simultaneous increase in electricity demand. This shift in fuel use has already shown a decrease in emissions from the power generation sector as from 2015.

Figure 4 shows the NO\textsubscript{x} and SO\textsubscript{x} emissions in kilotonnes (kt) from the power stations and fuel combusted in TJ from the public electricity and heat production sector. It is evident that emissions decreased substantially since 2009, and this can be attributed to a number of efforts implemented in the history of the electricity generation sector. Amongst such efforts, the decommissioning of both power stations and the reform in the power generation sector have contributed to such decrease in emissions.

Nowadays, SO\textsubscript{2} concentrations have reduced and are no longer a concern to the Maltese Islands. As a result, the number of passive diffusion tubes monitoring SO\textsubscript{2} was scaled down to 24 sites.

5.3 Closure of Marsa Power Station

In 2005, a monitoring station was installed in an industrial area in Kordin, downwind of the Marsa power station to monitor the effect of the power plant on the agglomeration. In March 2015, the Marsa Power Station, which used to operate on HFO was decommissioned, except for one generating unit which operates on a stand-by basis. Figure 5 shows the trends in concentrations of NO\textsubscript{2} and Nickel in PM\textsubscript{10} over a period of 10 years. The trends show a general decrease which continues post closure of the power plant. Other heavy metals were analysed in PM\textsubscript{10}, and the data is available however their concentration is very low and no conclusions can be reached from such data. Moreover, the heavy metal which is present in the highest
concentration in HFO is Nickel, therefore it is ideal to use this metal as an indicator of combustion of HFO.

![Annual NO₂ and Nickel concentrations (μg/m³)](image)

*Figure 5 Nitrogen Dioxide and Nickel concentrations in Kordin air monitoring station*

Due to the closure of the Marsa Power Station, SO₂ annual mean concentrations have decreased downwind of the power station from year 2014 to 2017 (Figures 6 and 7 below). SO₂ concentrations in 2014 range from 4.5 to 6.0µg/m³, while in 2017 SO₂ concentrations range from 3.0 to 4.5µg/m³.
**Figure 6** SO$_2$ Annual Mean Concentrations (µg/m$^3$) 2014

**Legend**

- SO$_2$ Annual Mean Concentration µg/m$^3$
- 2014
- $<$ 1.7
- 1.7 - 3.0
- 3.0 - 4.5
- 4.5 - 6.0

**Administrative Boundaries**

**Figure 7** SO$_2$ Annual Mean Concentrations (µg/m$^3$) 2017

**Legend**

- SO$_2$ Annual Mean Concentration µg/m$^3$
- 2017
- $<$ 1.7
- 1.7 - 3.0
- 3.0 - 4.5
- 4.5 - 6.0

**Administrative Boundaries**
Transport

5.4 The ban of leaded petrol

Benzene, a volatile organic compound known for its toxic effect, affects mainly the blood system of the human being when exposed for a long-term. This pollutant is considered carcinogenic and mutagenic, and can be harmful at any dose. Benzene is mostly present in the urban atmosphere due to the incomplete combustion of fuel in road transport and the handling and distribution of petrol (SOER, 2018).

Leaded petrol, when combusted, constitutes a risk for human health and the environment due to the atmospheric pollution by lead. Given that benzene content in the leaded petrol was between 6-8%, and the benzene content in the unleaded petrol was below 1%, leaded petrol was phased out in Malta in 2003 (SOER, 2005). Unleaded petrol, and later on lead replacement petrol (which due to amendments to the fuel quality directive limiting the content of certain metals in gasoline was suspended from the market), were introduced in Malta. Benzene concentration levels have been decreasing since the switch to unleaded petrol, as shown in Figure 8. Since 2004, benzene concentrations have remained well below the EU limit value of 5µg/m³ and has remained below the EU limit value since then. An annual average decrease of 0.3 µg/m³, ranging from 0.57 to 0.14 µg/m³ per year can be noticed in Figure 8 below.
Figures 9 and 10 below show a 29.4% decrease in benzene concentrations between the years 2014 to 2017. This remarkable difference can be mainly noticed in the Northern and Southern Harbour regions, also known as the agglomeration. This decrease can be attributed to the use of cleaner fuel in road transport, namely a lower benzene content in imported petrol.
Figure 9 Benzene concentrations in Malta in 2014

Figure 10 Benzene concentrations in Malta in 2017
5.5 Public transport reform

The public transport service in Malta was reformed in 2011, where the old and polluting buses were substituted with a younger and cleaner fleet.

To attempt to see the effect of the reform on ambient air quality, data from two air-monitoring stations was analysed; namely PM$_{2.5}$ from the traffic station in Msida and the urban background station in Żejtun, together with NO$_2$ in Msida (Figure 11). These pollutants were selected in view of their direct relevance to road transport emissions. PM$_{2.5}$ concentrations demonstrate a clear decrease during the time period, which continues post implementation of the public transport reform. This decrease is not mirrored in the NO$_2$ profile, and NO$_2$ levels seem to have stabilised. This trend is also confirmed by data from the diffusion tube network. A reason for this could be that any improvement in the reduction of PM$_{2.5}$ both through the public transport reform, and the improvement in technology of the newer vehicle fleet is being masked by the rising number of vehicles being registered on the road. In 2018, the number of newly licensed motor vehicles (new and used vehicles) increased at an average rate of 72 vehicles per day (NSO, 2019).

Moreover, whilst the introduction of diesel particle filters in Euro 4 cars and better might have contributed to the reduction of PM$_{2.5}$, the oxidization of NO into NO$_2$ might be the reason why NO$_2$ levels are not reducing any further. Additionally, the average age of the vehicle fleet (passenger cars) was 14 years in 2015$^3$ (TM, 2016), corresponding to the Euro 4 emission standard. This might explain the mismatch between the trend for PM$_{2.5}$ and that for NO$_2$ due to the introduction of the diesel particle filter (DPF) in Euro 4 vehicles, which is known to decrease emissions of PM$_{2.5}$ but increase the emissions of primary NO$_2$ (Grice et al., 2009).

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$^3$ The average age of a passenger car in Malta is significantly higher than the European Union average of 8.6 years.
5.6 Vehicle tracking for Public Transport

This measure is a real-time vehicle tracking and management system, which enables public transport operators to keep track of the vehicles’ movements within the network, and schedule the services according to the planned and current traffic conditions, considering current passenger journey behaviour and optimising operations efficiency. Moreover, vehicle tracking ensures that the public transport service is running in accordance with the schedule, and enables operators to monitor problems, such as traffic congestion and breakdowns (TM, 2016). It is planned that the implementation timeframe of this measure is extended to 2030.

5.7 Facilitate the development of a real time multi-modal journey planner

The multi-modal concept includes road networks, public transport network and internal maritime connections. There is the need to improve the current journey planner, to synchronise timetables, providing travelling information and incorporate a multimodal ticketing system to provide a better and smooth intermodal experience. Such improvements would facilitate the development of journey planners and smartphone applications which in turn would allow for better and more sustainable modal choices to be made in the future for passengers and freight (TM, 2016). It is planned that the implementation timeframe of this measure is extended to 2030.

5.8 Increase roadside checks and roadworthiness testing

Two of the main responsibilities of the Enforcement Directorate of TM is to act as a regulator for all licensed transport providers and ensure that all vehicles are within legal emission levels. In 2017, the Directorate routinely conducted a number of roadside checks, also referred to as
roadside technical inspections. Enforcement Officers are assigned to different locations every morning to check for roadworthiness of vehicles that are randomly selected. If the vehicles selected fail to pass the tests, a restriction is imposed on the vehicle licence and this restriction is lifted once TM deems that the vehicle is found roadworthy again. In 2016, there were 3,590 roadside technical inspections, while in 2017 this decreased to 2,751. Of the 2,751 vehicles inspected in 2017, 1,368 passed the test while 1,383 vehicles failed the test (TM, 2018a).

Inspections at VRT Stations, on the other hand, are carried out by the Technical Unit on a risk-based quality assurance approach. The Road Transport Licensing Unit continued with its commitment to ensure safer and cleaner vehicles on Maltese roads. To this effect, a number of quality control measures were carried out on VRT stations using a risk-based assessment. The following measures were also implemented:

- 1,247 post-VRT checks were conducted on high-risk vehicles. These vehicles were called at the Technical Services Unit for further inspection;
- 142 unannounced inspections were carried out at various VRT Stations to ensure that correct and full test procedures were being observed;
- All VRT stations were required to photograph all vehicles undergoing a test for further checking. 8,844 photos were verified by the Unit for correct photo taking and reporting procedures, and checking of the date and time when the vehicle was tested (TM, 2018a).

As a result of these measures, operators and testers which are found in breach of the VRT regulations are penalized accordingly in line with national court procedures.

The Enforcement Directorate is also responsible of the inspection of vehicles reported through the SMS Emissions Alert System. In 2017, 629 vehicles were reported through this system and were called for a test, of which 428 turned up. Consequently, 365 vehicles passed their test, while 63 vehicles failed (TM, 2018a). In addition, TM is also working on the upgrade of the SMS Emission Alert System through a smartphone application, facilitating the reporting of polluting vehicles.

5.9 The Kappara Junction

The TEN-T core network is a new infrastructure policy brought up by the European Commission that connects the whole of Europe by closing all gaps, removing bottlenecks and eliminating technical barriers that exist between the transport networks of the EU Member States. As a result of this new European transport policy, 22km of Malta’s road network are required to form part in the TEN-T core network, and further 90km of Malta’s road network have been identified as falling under the TEN-T comprehensive network, with a total of 29 TEN-T sections. By 2015, 73% of the TEN-T Core Network and 32% of the TEN-T Comprehensive Network were completed (TM, 2016).

One of the six top sections that required prioritisation was the Kappara Junction, identified as a TEN-T comprehensive network. This TEN-T network required the removal of bottlenecks and the upgrading of the regional road. This junction was the cause of a bottleneck for traffic
coming from Valletta, San Ġwann, Gżira and St Julians’s. Work on this project started in April 2016 and was completed in two years’ time, with an investment of €22.5 million\(^4\). The Kappara Junction was inaugurated in January 2018, and it is estimated that 100,000 litres of fuel will be saved\(^5\).

### 5.10 Economic measures and incentives related to the road transport sector

Road transport is responsible for most of the NO\(_x\) emissions in Malta and is therefore a concern in areas with high traffic influx. NO\(_2\) is also a source of very fine particles (PM\(_{2.5}\)). According to the National Household Travel Survey (NHTS) of 2010, the most common mode of transport in Malta is driving one’s private car (See Figure 12). By the end of 2018, the stock of licensed motor vehicles increased by 3.6% over the previous year, 77.9% of the total were passenger cars. By December 2018, 60.1% of the total vehicles were petrol-powered engines, 38.9% were diesel-powered engines, and only 0.6% were electric and hybrid vehicles (NSO, 2019). The following schemes have been introduced in the latest years to encourage the use of lower emissions vehicles.

![Mode of transport in 2010](Figure 12 Mode of transport in 2010 (NHTS, 2010))

**5.10.1 The scrappage scheme**

The scrappage scheme is a fiscal incentive that uses an annual grant system to scrap the old, polluting cars, which are at least 10 years old, and replacing it by a newer M1 category motor vehicle having a Euro Standard 6b or 6c\(^6\). The granted monetary value can vary according to the CO\(_2\) emission levels of the newly purchased Category M1 vehicle, varying from €800 to €2000 (details on the different grants available can be found in Section 5.10.3). This scheme was introduced in 2010 and has been renewed on a yearly basis to incentivise the purchase

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of vehicles that pollute less. Although this scheme has become popular, it does not address the problem of the increasing amount of vehicles on the road (TM, 2016).

5.10.2 Gas conversion scheme

Autogas, also known as Liquefied Petroleum Gas (LPG) is a cleaner fuel when compared to petrol. A scheme was launched in 2013 (which is still active to this date), granting €200 to vehicle owners who convert a Category M1 vehicle (passenger car) or a Category N1 vehicle (commercial) to run on autogas. During 2018, 142 vehicles benefitted from this scheme. Since 2015, there have been in total 861 LPG conversions. Out of the 861 applications, five were for N1 commercial vehicles (Malta NRP, 2019). The aim of this incentive is to reduce emissions from petrol/diesel-run vehicles. However, the number of petrol and diesel vehicles has increased over the years and the share of alternative fuel vehicles (which includes electric, hybrid and LPG vehicles) is still low (NSO, 2018).

5.10.3 Grants and schemes to purchase new environmentally friendly vehicles and to encourage the use of two-wheeled vehicles

The following grants have been set up to encourage the purchase of cleaner vehicles. Each person was eligible for one grant under this scheme:

- A €900 grant when registering a new category M1 vehicle with CO₂ emission levels up to 100g/km, while at the same time de-registering a vehicle in the same category. In 2018, 631 vehicles registered for this grant;
- A €700 grant when registering a new category M1 vehicle with CO₂ emission levels between 101 and 130g/km, while at the same time de-registering a vehicle in the same category. In 2018, 919 vehicles registered for this grant;
- A €3,000 grant when registering a new category M1 plug-in hybrid vehicle with CO₂ emission 1-50g/km, while at the same time de-registering a vehicle in the same category. There were no applications for this grant;
- A €2,000 grant when registering a new category M1 hybrid vehicle with CO₂ emissions between 50-65g/km. In 2018, 126 vehicles registered for this grant.

The grants above had a successful outcome with a total of 1,676 beneficiaries, and it was extended twice during 2018 (Malta NRP, 2019). These form part of the first phase of the measure in Section 8.5 on the Continuation of the EV Grants and Electro-mobility Action Plan.

The use of bicycles should not be considered only as a leisure activity, but rather as an alternative mode of transport for daily commuting. Bicycles and pedelecs are zero emission vehicles and do not create traffic congestion. To encourage the use of bicycles and pedelec bicycles as an alternative mode of transport and at the same time encouraging physical activity, a scheme was launched whereby an individual can purchase a bicycle or pedelec and apply for a one-time grant of 15.25% of the purchase price (Ministry for Finance, 2017). During 2018, there were 1,768 applications, out of which 1,766 applications were paid and two applications were rejected because they did not meet the requirements stipulated in the
Government Gazette. This scheme was renewed for 2019. Until end of January 2019, 209 applications were submitted, and all have been processed and paid (Malta NRP, 2019). In the case of bicycles, pedelecs and bicycle racks, the Maltese Government will provide a VAT refund up to €400 as announced in the 2020 budget (Ministry for Finance, 2019).

In 2018, the scheme above was extended to companies which purchase bicycles or pedelec bicycles and offered such bicycles for hire. A grant of 15.25% is provided on the purchase price of bicycles (subject to a maximum grant of €85 per non-mechanised bicycle and a maximum grant of €250 for a pedelec bicycle). This is up to a capping of €7,500 per applicant. Apart from encouraging more companies to enter into the bike-hiring business and assisting those already in this sector, this scheme promotes sustainable mobility other than the use of private cars and thus reducing traffic congestion. It has been renewed in 2019, with an indicative budget of €150,000 allocated for this grant scheme (Malta NRP, 2019).

Another incentive was introduced by the Government in 2016 to cover the expenditure incurred by local councils and enterprises to install bicycle racks and ancillary facilities, with a fund of €150,000 (Ministry for Finance, 2015). Local Councils are also being funded to promote the use of bicycles in their localities, with a fund of €30,000. This scheme has been renewed for 2019. In 2017, four applications were submitted: three from local councils and one from a private company. In 2018, five applications were submitted: three from local councils, one from a private company and one from a non-profit organisation (Malta NRP, 2019).

To further encourage the use of two-wheeled vehicles, the government announced that as from January 2016, small motorcycles that do not exceed 125cc will have their licenses drastically reduced to a flat rate of €10 a year. This scheme has been created to reduce the number of cars on the road, which take up more space than motorcycles do. The purchase of electric motorcycles is also exempted from VAT (Ministry for Finance, 2015).

5.10.4 Incentives for the purchase of electric vehicles

Another scheme was set up in 2018 whereby a grant of €400 is given when purchasing a new pedelec or upon registering of electric motorcycles, mopeds/tricycle falling under categories L1e, L2e, L3e or L5e. A total of 39 motorcycles/mopeds registered with a grant of €400, while 185 pedelecs were given a €400 grant. The purchasing of a new pedelec grant will be extended to 2019 (Malta NRP, 2019).

To further encourage the use of electric and hybrid vehicles, a grant of €6,000 is given upon registering a new electric category M1/N1 vehicle, without scrapping another vehicle. In 2018, 77 vehicles registered for this grant, and is being extended to 2019.

A grant of €7,000 is being offered when registering a new category M1/N1 vehicle, and scrapping another vehicle. In 2018, 51 vehicles registered for this grant, and is being extended to 2019.
When registering an imported second hand electric category M1/N1 vehicle, a grant of €4,000 is given. In 2018, 73 vehicles registered for this grant.

Another grant of €2,500 is given upon registering a new or used electric quadricycle, without scrapping another vehicle. In 2018, 27 vehicles registered for this grant.

Moreover, a grant of €25,000 is being awarded to BEV importers introducing a new BEV model on the national market or car leasing companies having 10 electric vehicles as part of their leasing fleet.

Furthermore, all electric and plugin hybrid vehicles and any vehicle that is propelled solely by gas are being exempted from the registration tax, and the owners will be exempt from the circulation licence for the first five years. Additionally, the drivers of these cars are allowed to use bus priority lanes, irrespective of the number of passengers being carried by the car.

These incentives emanate from the Malta National Electro-mobility Action Plan (MNEAP) published in 2013.

### 5.10.5 Bike sharing schemes

Public bike sharing schemes are very popular systems in European towns and cities. Nowadays, there are various bike-sharing systems in Malta, the first one started to operate in 2016. These bike-sharing systems are suitable for everyone, ranging from business travellers, tourists and students. The main aim of the bike sharing schemes is to achieve a modal shift to sustainable modes of transport, especially in the high traffic areas. Most of these schemes work through a smartphone application to register, rent and return a bike.

Malta Public Transport operates a bike-sharing system in Malta, called the ‘Tallinja Bike’, which facilitates travel within and around Valletta. ‘Tallinja Bike’ can be used by locals and tourists who would like to use alternative modes of transport in the Capital City, via a smartphone application. The ‘Tallinja Bike’ sharing system forms part of the Sustainable Urban Mobility Plan (SUMP) of the Valletta Extended Region, which is further discussed in Section 8.9.

By increasing the use of bicycles and decreasing the use of vehicles, traffic congestion is reduced, therefore NO₂ and PM concentrations in the most congested areas are reduced. These bike sharing schemes are planned to remain active until 2030.

### 5.10.6 Promoting multiple options not to travel during peak hours

Recently, several initiatives have been implemented in Malta (TM, 2016) with the aim of reducing the need to travel during the morning peak hour, between 07:30 and 8:30, which accounts for 11% of all traffic throughout the day. These initiatives include:

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- Online banking; reduces the need for bank users to travel to their local bank branch for simple actions, example a transfer of money;
- Online government services; reduces the need for people to travel to public offices for a simple application or query;
- Video conferencing and video-presentations; these can be easily affected nowadays since most employees are equipped with the proper equipment (laptops) to communicate via video conferences;
- Tele-diagnosis and remote maintenance; this measure allows ICT service providers to remotely resolve any technical issues that may arise;
- Flexi-working hours which lets employees travel to work during the non-peak hour; this allows employees to avoid the morning and evening peak hours;
- 'Tele-working' policy in the public sector; since this measure calls for employees to stay working from home, it subsequently results in a reduced number of vehicles on the road during the morning and afternoon peak hours.

Industry

5.11 Environment Permitting

One of ERA’s functions is the processing and issue of operational permits for certain installations and/or operations which are identified as having an environmental risk. Of direct concern in terms of emissions to air are those falling within the scope of the Industrial Emissions Directive (2010/75/EU) and The Medium Combustion Plant Directive (2015/2193/EU). Nonetheless, installations which do not fall within the scope of the aforementioned legislation are regulated through site specific permits which include either emission limit values or operational conditions aimed at the mitigation of emissions to air.

The Industrial Emissions Directive (2010/75/EU), also known as the IED, was adopted on 24 November 2010 and is the main legislative instrument regulating pollutant emissions from industrial installations. The IED entered into force on 6 January 2011, and was transposed into national legislation through S.L. 549.76 to S.L. 549.81 that entered into force on 7 January 2013.

The aim of the Industrial Emissions Directive is to control industrial emissions with the purpose of safeguarding the human health and the environment. The Directive lays down instructions to prevent and control pollution emitted into the air, water and land, and to avoid generation of waste from the large industrial installations. Emissions (including atmospheric emissions) from installations within the scope of the IED are subject to permit conditions which inter alia include the application of best available techniques and wherever applicable the achievement of the associated emission levels (AELs) in the respective best available techniques reference documents (BREFs).
By the end of 2018, the number of installations falling within the scope of the Industrial Emissions Regulations permitted to operate in Malta is as follows:

- 14 Integrated Pollution Prevention and Control (IPPC) installations; two of which are Large Combustion Plants (LCPs) installations;
- 19 installations with limitation of emissions of VOCs.

The Medium Combustion Plant Directive (2015/2193/EU) of 25 November 2015 was transposed into national legislation through S.L. 549.122. This Directive was based on a Commission’s proposal, which was part of the Clean Air Policy Package (published on 18 December 2013). The MCP Directive regulates emissions of SO$_2$, NO$_x$ and dust into the air from medium combustion plants, with a rated thermal input equal to or greater than 1MWth and less than 50MWth. Moreover, the MCP Directive also ensures the implementation of the obligations arising from the Gothenburg Protocol under the Convention on the Long Range Transboundary Air Pollution, which also sets emission limits for the same pollutants. By the end of 2018, there were 13 MCP installations permitted to operate in Malta. The emission limit values as set in the MCP Regulations started applying as from 20 December 2018 for the new plants, whilst for the existing plants, they will start applying as from 2025 or 2030 (depending on their size)$^8$. The MCP Directive also requires monitoring of carbon monoxide (CO) from such plants with the aim of collecting data on CO emissions from these plants so as to assess whether such a parameter would need to be regulated through amendments in the MCP Directive.

Agriculture

According to Malta’s national emission inventory, agricultural activity is the main source of ammonia emissions in the Maltese Islands (Figure 18 indicates the main categories responsible for ammonia emissions in Malta). Figure 13 shows how nearly all total ammonia emissions derive from the agricultural sector and these have decreased slightly throughout the last twelve reporting years. This can be attributed to the decline in animal heads.

In livestock buildings, ammonia can be a threat to livestock and agricultural workers as it can cause, over time, significant respiratory hazard to those exposed to this gas on a daily basis. When reducing ammonia emissions indoors, the health of animals and workers is improved. In addition, the proper management of livestock manure also reduces nitrogen losses in the soils.

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Horticulture activity in the Maltese Islands has shifted gradually from traditional practice towards intensive production systems throughout the past seventy years. Imported technologies are used to increase yields per area, by the intensive use of agro chemicals and fertilisers. The Maltese Code for Good Agricultural Practice (2001), also referred to as the CoGAP, was developed with a view to create a compilation of good practices pertaining to the Nitrates Directive, the Malta Action Programme and other Directives. The development of the CoGAP was based on the provision of long-term sustainable directives addressed to farmers, keeping in mind an environmentally friendly perspective and cost-effectiveness.

The CoGAP focuses on several sectors, including the following:
- Fertilisation practice
- Manure management
- Animal husbandry

5.12 Fertiliser plan and application

The mismanagement of animal manure and chemical fertilisers can cause nitrogen loss. Excess application of organic (or inorganic) fertiliser can cause nitrogen to be washed away by torrential rains, resulting in the contamination of freshwater aquifers, drinking water supplies and bathing water. In addition, excessive nitrogen levels in a water body can cause eutrophication.

Moreover, the over-application of organic and chemical fertilisers can further increase ammonia volatilisation, thus increasing ammonia emissions into the atmosphere. To regulate this problem, the amount of manure or fertiliser is controlled through a fertiliser plan (which
varies from one field to another) as issued by the Competent Authority or personnel (ARPA, 2015), and which must take into account:

- Nutrient demand of the crop in relation to the yield level
- Nutrient content in the soil
- Nutrient content in the mineral and organic fertilisers that will be applied
- Nutrient content of other sources
- Regulations for fertiliser application
- Best time for application (CoGAP, 2001)

A fertiliser plan is to be issued by a qualified person as approved by the competent authority, i.e. the Agriculture Directorate within the Rural Development Department.

In addition, farmers are required to keep records of manure transport. Records must include the name of contractor, the amount and type of manure, the date of delivery, destination, registration number of the truck delivering manure and contract number of contractor. Moreover, farmers should keep record of the purchase or sale of mineral and organic fertilisers (including the type of fertiliser and nutrient content of fertiliser) (ARPA, 2015).

The InfoNitrates Life+ Project was an information and communications campaign aimed at the proper use and management of nitrates in agriculture and livestock husbandry, thus improving the implementation of the national Nitrates Action Plan. This project started on 1 September 2011, and ended on 30 June 2014. The implementation of the InfoNitrates Life+ Project consisted of several training sessions at farms, as well as twenty-nine public meetings around Malta and Gozo. Farmers were given an individual fertiliser plan (which varies from one field to another, as explained above in this section). The implementation of a fertiliser plan reduces the Gross Nitrogen Balance on the farms where it has been applied, thus farmers are able to meet their obligations under the Nitrates Action Plan, as well as increasing the efficiency in fertiliser practices. The project also helped farmers in changing their farming practices so that nitrogen levels in soil are reduced through the correct application of nitrogenous fertilisers and to train livestock breeders in the proper management of animal manure so that nitrogen levels in soil are reduced. In this way, farmers save on fertilisers by applying only the necessary amounts while at the same time they protect the environment.

The Project offered information, which was made available at the InfoNitrates Office, as well as a free phone service. The InfoNitrates Office received 622 calls from local farmers, mainly enquiring on technical issues such as storage requirements for manure and fertiliser, as specified in the Nitrates Action Plan.

### 5.13 Manure storage facilities

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Given that in Malta the rainy season falls mostly between 15th October and 15th March, application of manure on agricultural land during this period is prohibited to prevent nutrient run-off and leaching (CoGAP, 2001). To this effect, during this same period livestock manure must be stored in a covered and leak-proof clamp, connected to a cesspit.

Manure clamps should be built with three rendered high walls with the least possible surface to volume ratio. A reduction in the surface area implies a reduction in ammonia emissions.

The InfoNitrates Life+ Project also delivered training sessions on the proper storage and transport of manure, as well as to finding tailor-made technical solutions according to the number and type of livestock (dairy cows, cattle, sheep or goats). Training was provided to 2,032 operators, around 73% of those available.

5.14 Animal housing

In line with the Nitrates Regulations S.L. 549.25, animals must be housed to decrease the possibility of nitrates leaching. The manure handling systems within an animal housing envelope can be designed to reduce ammonia emissions by decreasing its volatilisation. The emissions can be reduced by keeping all areas in the animal house (inside and outside, including passageways) dry and clean (ARPA, 2015), by keeping manure surfaces in pits as small as possible, by separating faeces and urine immediately, and by making sure that the air flow and air temperature over surfaces with excreta is kept as low as possible, without reducing the overall ventilation (United Nations Economic Commission for Europe, 2015). Moreover, appropriately designed animal housing is beneficial to the farmer’s health since the proper management of feed, bedding material, manure and the animals can reduce dust, thus reducing the possibility of bronchitis and occupational asthma.

5.15 Livestock feeding strategies

The Agriculture Directorate manages a voluntary scheme entitled “Products of Quality National Scheme” (PQNS) which is open to all interested actors who form part of a recognised agricultural value chain. The scheme develops standards of production which identify the production and farming methods and those elements that characterize the superior quality of the product. The PQNS requires feeding practices to be guided by qualified animal nutritionists or any other competent person in animal nutrition for feeding practices. When animals are fed more than they require, excess nitrogen is excreted in urine and faeces, resulting in increase in gases (ammonia) and odour. When feeding the animals according to their nutritional requirements, nitrogen excretion and consequently ammonia emissions are reduced without altering the animals’ productivity (A Primer on Livestock Air Quality, n.d.).

5.16 The Governance of Agricultural Bio-resources Agency

The Governance of Agricultural Bio-resources Agency (GAB) was established through SL 497.22 in May 2017. The Agency was set up to update, co-ordinate and implement the Agricultural Waste Management Plan, with the main aim to sustainably manage agricultural bio-resources in a manner that supports the Maltese agricultural sector. The Agricultural Waste Management Plan is further discussed in Section 8.25.

Energy Demand

The energy sector in Malta has improved in the recent years, providing Maltese society and businesses with affordable, sustainable and secure forms of energy. Malta’s energy policy focuses on maximising effective renewable energy potential, and thus the Government is increasing measures related to the deployment of renewable energy, especially photovoltaics and solar water heating systems (NECP, 2018). The following measures are referred to in the draft NECP.

5.17 Provision of professional advice to households

The Energy and Water Agency are offering professional advice (free of charge) to vulnerable and low-income households on energy efficient appliances and behaviour. This scheme helps to reduce consumption costs and helps in generating savings which count towards Malta’s energy efficiency targets. From its inception to the end of 2018, a total of 2,121 household visits have been carried out, and this scheme shall continue in 2019 (Malta NRP, 2019).

5.18 Replacement of Appliances in Vulnerable Households Scheme

The Energy and Water Agency, in collaboration with the LEAP centres within the Foundation for Social Welfare Services have set up financial schemes aimed to reduce energy and water consumption in low-income households through the replacement of old and inefficient appliances with new energy-efficient models. At the same time, this scheme helps in generating savings which count towards Malta’s energy efficiency targets. In 2017, a total of 472 visits to vulnerable households were carried out, of which 242 households have had one of their appliances replaced during 2018. The appliances were distributed during September 2018. Following the success of this scheme, a new tender has been published to assist other vulnerable families during 2019 (Malta NRP, 2019).

5.19 Exploit all reasonable potential indigenous RES through PV technology deployment

PV technology turned out to be the most robust of all indigenous sources of RES. Yield of PV systems in Malta is amongst the highest in Europe. There was a sharp increase in the uptake of PV between 2010 and 2017, with the total cumulative installed capacity at end of 2017
standing at approximately 110 MWp. This has happened largely thanks to incentives offered through various schemes, including ERDF co-financed grants, attractive feed-in tariffs and decreasing PV technology costs. Measures targeted exploiting of remaining rooftop potential on industrial, domestic and public buildings (NECP, 2018).

5.20 Feed-in tariffs scheme (electricity generated from solar PV installation)

The purpose of Subsidiary Legislation 545.27 titled Feed-in Tariffs Scheme Regulations from 2010 is to establish a feed-in tariff for electricity generated from solar PV installations and hence promote and support the generation of electricity from renewable energy sources. The tariff included systems benefitting from a capital grant. The introduction of the feed-in tariff increased the exploitation of roof space, including that of premises with no consumption of electricity and hence no incentive for net metering. Feed-in tariffs are revised regularly to ensure a reasonable return on investment and avoid overcompensation (NECP, 2018). In the Budget Speech 2020, it was announced that as from 2020, a grant will be offered to cover 25% of the expenditure for the purchase of renewable energy batteries, capped at €1,000 (Ministry for Finance, 2019).

5.21 Competitive bidding process for PV systems equal or larger than 1MWp

The scheme provides support for electricity generated from renewable sources, restricted to that produced by PVs with capacity above 1 MWp. Aid is provided for 20 years in the form of a premium over and above the proxy for the market prices of electricity (NECP, 2018).

5.22 PV grant schemes

To further encourage and promote the use of renewable sources of energy for domestic use, several grant schemes were launched. A major part of uptake of PVs on residential premises took place as a direct result of EU-funded grant schemes enabling households to benefit from up to 50% of the initial capital investment (NECP, 2018).

5.23 Solar water heaters and collectors scheme

Since 2005 a number of grant schemes to promote the use of SWH for households have been launched and completed. Previous schemes were restricted to specific households, mainly those that meet social assistance criteria. The current National Scheme provides a grant of 50% up to €700 and is not restricted by social criteria (NECP, 2018).

5.24 Biofuels Substitution Obligation (2011 – 2020)

The substitution obligation on the imports and wholesales of fossil fuels was introduced in 2011 through an amendment of S.L. 423.28, with the aim of promoting the use of biofuels. It
is required by law that a percentage of total energy content of petrol and diesel placed on the market for use by road transport is biofuel. During 2018, this share reached 8.5% (by energy content) (NRP, 2018).

5.25 Energy efficiency obligation

The Energy Efficiency Obligation considered for Article 7 target of the EED consists of the progressiveness of the domestic residential household tariff system and the incentive towards energy efficiency in the tariff structure (eco-reduction). Savings are measured as a direct reduction of electricity consumption (NECP, 2018).

5.26 Financing schemes and fiscal incentives

Includes various schemes to incentivize target sectors to adopt more energy efficient technologies. Financial instruments address energy efficiency measures within industrial processes, transport and buildings. These policy measures aim to target the residential, industrial, commercial and transport sectors (NECP, 2018).

5.27 Regulations and voluntary agreements

These measures target heavy consumers of energy with the aim of encouraging the adoption of energy efficient techniques. The national voluntary agreement scheme, the Energy Efficiency Partnership Initiative (EEPI), has been set up to foster, improve and create a roundtable for improved relations between Government and large enterprises with the aim of resulting in the uptake of energy efficiency practices. Voluntary agreements last for three years. This measure also includes energy savings resulting from excise duties on motor fuels exceeding EU’s minimum levels (NECP, 2018).

5.28 Public sector leading by example in the energy demand sector

The Government and public entities undertake measures and projects to increase energy efficiency in their spheres of activity, particularly in services and buildings. Measures include street lighting retrofitting, public schools or the Tal-Qroqq National Pool Complex Project (NECP, 2018).
6. DEGREE OF COMPLIANCE WITH NATIONAL AND UNION OBLIGATIONS

6.1 Degree of compliance with the emission reduction commitments as set in Annex II of the NEC Directive

The following chapter provides a summary of the trends and sources of the five main pollutants reported under the NEC Directive, and their compliance with the Directive.

Figure 14 below shows the national total emissions of the five main pollutants reported under the NEC Directive, from year 2005 to 2017. It can be noticed that the national total emissions (NO\textsubscript{x}, NMVOC, SO\textsubscript{x}, NH\textsubscript{3} and PM\textsubscript{2.5}) in 2017 decreased by more than half when compared to 2005, and this is mainly due to the considerable reduction in SO\textsubscript{x} emissions (which decreased by almost 95%). NO\textsubscript{x} emissions have also reduced as a result of measures related to the reform in the power generation sector.
Table 1 Overall percentage reduction of national total emissions

<table>
<thead>
<tr>
<th>Pollutants</th>
<th>2005 in kt</th>
<th>2017 in kt</th>
<th>Overall % reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO\textsubscript{x}</td>
<td>9.19</td>
<td>5.37</td>
<td>41.6</td>
</tr>
<tr>
<td>NMVOC</td>
<td>3.83</td>
<td>3.45</td>
<td>9.9</td>
</tr>
<tr>
<td>SO\textsubscript{x}</td>
<td>11.98</td>
<td>0.63</td>
<td>94.8</td>
</tr>
<tr>
<td>NH\textsubscript{3}</td>
<td>1.46</td>
<td>1.13</td>
<td>22.5</td>
</tr>
<tr>
<td>PM\textsubscript{2.5}</td>
<td>0.73</td>
<td>0.32</td>
<td>56.5</td>
</tr>
</tbody>
</table>

6.1.1 Nitrogen oxides (NO\textsubscript{x})

The energy sector is the major source of NO\textsubscript{x} emissions in the Maltese Islands. The overall NO\textsubscript{x} emissions decreased by 41.6% between 2005 and 2017, mostly due to improvements in the power generation sector (See Figure 4). The key category with the highest NO\textsubscript{x} emissions, amounting to 3.3kt in 2017 is the road transport sector, comprising of passenger cars, light and heavy-duty vehicles and buses. Other key sources of NO\textsubscript{x} emissions are international aviation, power generation and national navigation. As at base year 2017, Malta is in compliance with the 2020 emission reduction commitments as set in the NEC Directive, however more effort needs to be employed for Malta to be able to reach its NO\textsubscript{x} ceiling for 2030.

6.1.2 Non-methane volatile organic compounds (NMVOCs)

NMVOC emissions have decreased by 9.9% between 2005 and 2017. NMVOC emissions are mainly the result of road transport (passenger cars and gasoline evaporation), domestic
solvent use, biological treatment of waste, manure management (non-dairy cattle), distribution of oil products, mopeds, motorcycles, heavy duty vehicles and buses, national navigation and other sources. As at base year 2017, Malta exceeded the emission reduction commitment as set for 2020 (2.5kt) in the NEC Directive. This could be due to an overestimation in emission calculations from domestic solvent use.

**Figure 16 NMVOC Sources (2017)**

6.1.3 Sulphur oxides (SO\(_x\))

SO\(_x\) emissions have decreased from 11.98kt in 2005 to 0.63kt in 2017: a reduction of 94.8%, mainly due to the use of cleaner fuels. Following this major decrease in emissions, the situation at present indicates that 87% of the SO\(_x\) emissions in the Maltese Islands in 2017 derive from public electricity and heat production, amounting to 0.55kt of emissions. Other sources of SO\(_x\) emissions are stationary sources (commercial/institutional), international aviation (civil) and other sources. Public electricity and heat production used to be a major source of SO\(_x\) emissions, however this changed as a result of recent developments in the power generation sector (as discussed in chapter 5). As at base year 2017, Malta is in compliance with the 2020 (2.53kt) emission reduction commitments as set out in the NEC Directive.
6.1.4 Ammonia (NH₃)

The agricultural sector is the main source of NH₃ emissions. Between 2005 and 2017, NH₃ emissions decreased by 22.5% which can be mainly attributed to a decrease in animal heads. The main agricultural sources are the animal manure as applied to soils and manure management of dairy cattle, laying hens, non-dairy cattle, broilers, swine and other animals. As at base year 2017, Malta is in compliance with the 2020 (1.5kt) and 2030 (1.3kt) emission reduction commitments as set out in the NEC Directive.
6.1.5 Fine particulate matter (PM$_{2.5}$)

Between 2005 and 2017, PM$_{2.5}$ emissions decreased by 56.5%. This reduction is mainly due to the power generation sector, followed by a smaller reduction from road transport and agriculture. The main sector responsible for these emissions is the road transport sector (passenger cars, light and heavy-duty vehicles and buses, automobile tyre and brake wear). Other sources include national navigation (shipping), public electricity and heat production. As at base year 2017, Malta is in compliance with the 2020 (0.98kt) and the 2030 (0.35kt) emission reduction commitments as set out in Annex II of the NEC Directive.
6.2 Degree of compliance with Ambient Air Quality Legislation

Malta has divided its territory into zones and agglomerations, as required by the Ambient Air Quality Directive. Figure 20 shows the designation of the Malta agglomeration\textsuperscript{11}, following the assessment carried out by Stacey and Bush in 2002. The area consists of the Valletta-Sliema agglomeration, further extended to cater for the most densely populated areas. Although most of the real time monitoring stations are located in the agglomeration, two other stations are situated in the Malta zone\textsuperscript{12}, so as to continuously improve the knowledge on air quality trends throughout the Maltese Islands.

Since accession, Malta has surpassed the allowed number of exceedances of the PM\textsubscript{10} daily limit value in 2010 (after deduction of natural contributions), and the allowed number of exceedances of the NO\textsubscript{2} hourly limit value in 2011. Both exceedances were registered in the agglomeration, specifically at the traffic station in Msida. To this effect an Air Quality Plan was

\textsuperscript{11} ‘Agglomeration’ is defined to be a zone that is a conurbation with a population in excess of 250,000 inhabitants or, where the population is 250,000 inhabitants or less, with a given population density per km\textsuperscript{2} to be established by the Member States.

\textsuperscript{12} ‘Zone’ is defined to be part of the territory of a Member State, as delimitated by that Member State for the purposes of air quality assessment and management.
published in 2010, which focused on traffic measures with the main measure being the reform of the public transport system.

The State of the Environment Report published by ERA in 2018, presents air quality trends from 2009 to 2015. It is evident that the traffic station registers higher levels of traffic generated pollutants when compared to the urban background and background sites. However, following deduction of natural sources (such as Saharan dust and sea salt), Msida station remains within the limits stipulated by Directive 2008/50/EC, although hovering around the limit values for PM$_{10}$ and NO$_2$. This identifies the need to tackle road transport with priority.
7. PROJECTED FURTHER EVOLUTION ASSUMING NO CHANGE TO ALREADY ADOPTED POLICIES AND MEASURES

Projections provide the necessary information to assess the future emission reductions. They provide a clear indication if a Member State is projected to comply with emission reduction targets on the basis of the current adopted PaMs, or whether additional PaMs need to be implemented for compliance purposes.

7.1 Projections for the WM Scenario

The baseline (WM) scenario assumes that Malta implements the same measures adopted as at end 2017 throughout until 2030. Table 2 below displays Malta’s emission reduction commitments as set for 2020 and 2030 for NO\textsubscript{x}, NMVOC, SO\textsubscript{2}, NH\textsubscript{3} and PM\textsubscript{2.5}, and the projected emissions of the same pollutants for years 2020 and 2030, taking into account the baseline scenario (WM).

<table>
<thead>
<tr>
<th>Pollutants</th>
<th>2017 emissions in kt</th>
<th>2020 ceilings in kt</th>
<th>Projections for year 2020 in kt</th>
<th>2030 ceilings in kt</th>
<th>Projections for year 2030 in kt</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO\textsubscript{x}</td>
<td>5.37</td>
<td>5.4</td>
<td>5.10</td>
<td>2</td>
<td>4.88</td>
</tr>
<tr>
<td>NMVOC</td>
<td>3.45</td>
<td>2.5</td>
<td>3.37</td>
<td>2.86</td>
<td>2.91</td>
</tr>
<tr>
<td>SO\textsubscript{2}</td>
<td>0.63</td>
<td>2.53</td>
<td>0.10</td>
<td>0.56</td>
<td>0.13</td>
</tr>
<tr>
<td>NH\textsubscript{3}</td>
<td>1.13</td>
<td>1.5</td>
<td>1.19</td>
<td>1.3</td>
<td>1.18</td>
</tr>
<tr>
<td>PM\textsubscript{2.5}</td>
<td>0.32</td>
<td>0.98</td>
<td>0.32</td>
<td>0.35</td>
<td>0.31</td>
</tr>
</tbody>
</table>

The projected emissions for the baseline scenario show that SO\textsubscript{2}, NH\textsubscript{3} and PM\textsubscript{2.5} will be in compliance with the emission reduction commitments as set in 2020 and 2030.

The projected NMVOC emissions exceed the 2020 and 2030 emission reduction commitments. Emission calculations for the sector related to ‘Domestic Solvent Use including Fungicides’ are estimated using a very basic methodology, possibly leading to an overestimation of emissions. Therefore, these projections are still subject to further studies and verification.

NO\textsubscript{x} emissions are projected to be compliant with the 2020 ceiling, however a non-compliance with 2030 ceiling is projected. For this reason, the WaM scenario focuses on the sector accountable for the majority of the NO\textsubscript{x} emissions, i.e. the transport sector, which is responsible for 62% of the total NO\textsubscript{x} emissions in 2017 (Figure 15).
8. POLICY OPTIONS CONSIDERED TO COMPLY WITH THE EMISSION REDUCTION COMMITMENTS FOR THE PERIOD BETWEEN 2020 AND 2029 AND FOR 2030 ONWARDS

As per Section 7.1 of this programme, NO\textsubscript{x} emissions need to be substantially reduced to be in compliance with the NEC 2030 ceiling as set for Malta in the NEC Directive. Therefore, the future policy options considered focus mainly on measures which can reduce NO\textsubscript{x} emissions from road transport.

The following measures are being considered in the “With additional Measures” (WaMs) scenario.

Transport

Some of the measures are aimed at improving road networks by implementing infrastructural interventions, while others are aimed at improving the efficiency of the transport system in a sustainable manner.

8.1 Free school transport

Most of the morning rush hour traffic in Malta is attributed to the starting times of both schools and work places coinciding in the same hour. This is also reflected in ambient air pollution trends at the traffic site (see Figure 21), whereby CO concentrations are seen to experience a higher peak during the winter period, which is not present in summer. A less obvious evening rush hour peak is also present in winter.

The government devised a measure whereas students attending state, Church or private schools are picked up by public transport vehicles (mini-vans) from their localities and dropped off to their respective schools, and vice versa. This measure has been in effect since the start of the scholastic year 2018-2019, where about 28,000 students benefitted from this incentive, making a positive contribution towards the environment as the number of cars on the road during peak hours is estimated to have reduced by 15,000 vehicles (Malta NRP, 2019).
8.2 **Tallinja card incentives**

Regular commuters using public transport can register for a personalised *tallinja* card, an intelligent bus card designed to make it easy for the user to use the bus. It offers reduced fares and the ability to top up the card online or through a phone call. There are different card categories, and fares vary from one category to another: child, student, adult, Gozo resident, and Concession (seniors and Special ID cardholders). Making use of the *tallinja* card offers incentives and intermodal services, such as the IoScoot motorbike-sharing service and the ferry service, thus reducing dependency on private cars.

8.2.1 **Tallinja’s Capping System**

The *tallinja* card offers a capping feature, which allows cardholders to enjoy unlimited travel in a specified period, being either a single day, a week or a calendar month. Capping differs from one card category to another. The capping system was introduced with the Tallinja Card in July 2015. Before that, passengers could buy a 30-day ticket for €26. The difference between the capping system and the previous ticket system is a cost-benefit to the customer,
since there may have been “wastage” in the previous system, for example, when the customer is not able to use the public transport for a whole week. In the capping system, if the passenger travels less during a particular month, and spends €15 for example, there would be a saving compared to the previous system. Moreover, when the total cost of all journeys reaches a pre-determined limit, a cap is applied to the applicable fares and no further charges are imposed on the card.

8.2.2 IoScoot: An electric motorbike sharing service

In August 2018, the first motorbike-sharing service, the IoScoot, was launched. The fleet consists of 40 electric motorcycles, with a charge of €0.25c per minute of drive time. The IoScoot and the Malta Public Transport have teamed up in order to offer tallinja cardholders with discounted rates (€0.20c per minute of drive time) on the electronic bike sharing service. The electric motorbike sharing service offers an easy, convenient and environmentally friendly way to travel. The user needs to have a moped licence and booking is done on the Meep smartphone application by locating the closest electric motorbike, unlock it and ride it to destination. The user is only charged on the journey time, and there are no monthly membership fee or any other cost.

The IoScoot’s fleet is currently available in St Julian’s, Sliema, Msida and Valletta, and users can travel beyond these zones.

8.2.3 Tallinja Ferry Service

In 2017, Malta Public Transport and Valletta Ferry Services have teamed up to offer tallinja cardholders discounted rates when paying with their tallinja card for their journey by ferry from Sliema to Valletta and vice versa, and from Cospicua to Valletta and vice versa.

8.2.4 TD Plus

The public transport system in Malta has various routes meant to offer a quicker connection between popular localities, a system called ‘tallinja direct’. Malta Public Transport also offers an on-demand service called the TD Plus, providing greater flexibility, more comfort and benefit while saving time. The TD Plus uses technology that matches the requests made by different passengers when booking through the tallinja mobile application, to select the most efficient route, on a specific date and within a specific time bracket. TD Plus is currently operating between Valletta and Pembroke, including St. Julian’s, Swieqi, San Ġwann, Msida, Pietà and Floriana.
8.3 Free Public Transport fares for youths, students and elderly persons

Up to end of December 2018, take-up of the tallinja card increased to 317,626. Passengers between January and December 2018 amounted to 53,467,404, representing an 11% increase on the previous year (Malta NRP, 2019). The increase in passengers could be associated with the following measures.

To encourage the use of public transport, all 18 year olds in 2017 in Malta benefited from the first phase of the free Public Transport as part of an EU initiative. In 2018, the scheme was extended to a second phase, whereby youths aged between sixteen and twenty years benefited from it. Around 28,000 were eligible to this scheme in 2018, of which 24,000 of them actually benefitted (Malta NRP, 2019).

As from 2019, free public transport fares were extended to a third phase, which includes youths aged between 14 and 20 years and fulltime students over the age of 21 (Malta NRP, 2019). This age group has been specifically selected since it is the age when one normally chooses their means of transport. It is planned that this last phase is extended up to 2030.

As announced in the Budget Speech 2020 (Ministry for Finance, 2019), elderly persons who have reached the age of 75 will benefit from free public transport. More than 19,000 elderly persons will benefit from this measure.

8.4 Develop and incentivise schemes to promote multiple occupancy

Further to Chapter 5.8.5, the following initiatives can further reduce the need for the individual to travel during the morning peak hour, or shift to cleaner travel means, as suggested in TM’s Master Plan (2016). These include:

- Financial incentives to shift from private cars to car-pooling or bicycle use.
- Parking-priority for shared mobility services.
- Rewarding companies implementing ‘Green Travel Plans’; a 2019 Action Plan for the Green Travel Plan is currently being put together for the Ministry for Infrastructure, Transport and Capital Projects (MTIP) as a pilot project to later implement similar initiatives in other Ministries based on the resultant experience (Malta NRP, 2019).

The implementation period for these schemes is envisaged between years 2021-2025.

8.5 Review of Malta’s National Electro-mobility Action Plan (MNEAP)

The MNEAP is currently being revised to reflect the National Transport Strategy and National Transport Master Plan. The current electric vehicle grants will continue through the revised
action plan. The measures that will be included in the revised MNEAP will be tested and simulated through an Interreg Med funded Project (NECP, 2018).

It is planned that the revised plan will outline Malta’s continued efforts in implementing sustainable mobility initiatives, tackling the key transport hubs, aiming to have more than one mode of transport in one specific location, to facilitate cleaner mobility. Work is ongoing to increase charging infrastructure, safe cycling routes and the upgrading of ferry landing sites. There are also plans to implement pilot projects on the conversion of heavy-duty vehicles from conventional fuels to cleaner technology.

Phase one of this measure refers to the current grants offered in sections 5.10.3 and 5.10.4. The second phase of this measure refers to new packages of grants that are being proposed and which will cover a larger extent of vehicle types.

8.6 Car sharing schemes

In the recent months, the MNEP launched the first electric car sharing service in Malta, the GoTo Car Sharing Scheme. The aim of this initiative is to decrease the number of cars on the road and encourage the general public to use electric vehicles. There are currently 2,500 subscribers to the GoTo Car Sharing smartphone application, with a €7 monthly membership fee (the first two months of registration are free) and a charge of €0.28c per minute of drive time. Through the app, subscribers book a car and a parking in their place of destination. The scheme is mostly used in Valletta, Sliema, Ta’ Xbiex, I-Imsiida, the airport and Ċirkewwa. There are currently 150 electric vehicles registered to this scheme, and 225 charging pillars are dedicated to this EV charging network (Malta NRP, 2019). Since this initiative has proven to be successful, it is planned that this scheme is extended further.

8.7 Study the introduction of Low Emission Zones

Low Emission Zones (LEZ) are designated areas in which higher levels of air pollutants are controlled through the management of the vehicles entering the area. Different European countries have implemented the LEZ concept in different ways e.g. by letting the cleaner vehicles access the zone or through behaviour changing methods. Malta is considering this not only to honour the European Union targets, even though this is a priority within the context of this plan, but also to improve the quality of the air of our citizens and also to preserve their health.

Transport Malta (2016) identified two potential areas (Figure 22: the capitals of Victoria Gozo, and Valletta, and surrounding areas) where congestion is already an issue and therefore have the potential to exceed the identified targets in the future and thus need urgent attention.

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In the National Transport Master Plan, TM models two scenarios for the LEZ measure whereby both scenarios moderate the management of private cars entering the designated area and increase support of public transport and alternative modes. Both scenarios examine the effect of restricting the entry of vehicles into the area and this is carried out for two emission standards (Euro 1 and 2, exempting cars manufactured after the years 1996 and 2000 respectively).

Apart from systems intended to achieve similar results in terms of air quality, the LEZ could be based on a system similar to the Controlled Vehicular Access (CVA) System implemented in Valletta as part of the SUMP carried out in Malta between 2006 and 2010. The combined effect of several integrated actions, which includes the implementation of a CVA system, led to a modal shift of 10% away from the car and onto alternative modes of transport (TM, 2016).

Transport Malta, in collaboration with the Environment and Resources Authority, aim to undertake a study in 2020 to look at the different options available to Malta and Gozo, and to assess which ones would deliver the desired results swiftly. The suggested study would assess the size of a feasible LEZ within the already identified potential zones to achieve the greatest positive impact to the environment, with the greatest benefit to citizens’ everyday lives.

The study would involve a multi-Ministry and agency taskforce comprised of experts who would also assess what measures would best suit the situation and the future scenarios. The priority shall be to make this LEZ a successful system and thus the requirement to attract the citizens’ confidence that this scheme is beneficial on all fronts and to avoid failure and distrust. With the ultimate aim to induce a long-term (especially commuter) behavioural change of how people get to-and-from congested areas, which would lead to cleaner air throughout the Maltese Islands.

The study will have to take into consideration the current scenario on private car ownership and the impacts of the measures proposed. It may also consider the management of the area in phases, allowing the car owners to adjust. The underlining priority of introducing an LEZ shall be that it will accelerate the shift towards alternative means of transport, ensuring their availability, and less polluting vehicles on the roads. Therefore, the LEZ shall not stand on its own. Other initiatives and measures shall look into ways to further consolidate existing schemes or combination of, including car-pooling, combined park and ride systems, feasible electric car-sharing systems, extended scrappage schemes, and an improved public transportation system.

The aim of this measure is to encourage people to travel outside peak hours, to get rid of old polluting vehicles, and change commuting behaviour. Whether the system should operate on a five-day traditional working week scenario, six days a week to include the busiest shopping day of Saturday, or every day will also be looked at.
8.8 Develop a national bicycle strategy

Cycling is a healthy way of travelling. It does not cause air or noise pollution. Practicing cycling itself does not require expensive infrastructure, albeit the necessary space has to be made available to ensure safe cycling.

Unfortunately, cycling cannot be considered as totally safe, especially as it has to share the same road network as for conventional modes of road transport. In 2016, national statistics show that injuries sustained by cyclists amounted to 36 (out of a total 1852 casualties, in all ranges of severity, reported)\(^4\).

Throughout the last decade or so, cycle lanes started being incorporated in the road infrastructure design for arterial roads with the aim of making it safer for cyclists to use the

road network. There are currently 25km of designated cycle lanes, and another 7.7km are planned to be incorporated within or alongside the main road network, as part of ongoing and future improvements of the road network. However, cycle lanes are not interconnected, are limited in length and do not form a continuous safe cycling network.

To further promote and support cycling in Malta as a sustainable mode of transport, the Ministry for Transport, Infrastructure and Capital Projects kick-started a consultation on the National Cycling Strategy and Action Plan in November 2018. This was prepared in conjunction with Transport Malta, and most of the measures being recommended are in accord with what is being suggested in the National Transport Master Plan 2025 with respect to cycling, including the implementation period (2025). A new stakeholder platform has been created, named Cycling Malta, which will be chaired by Transport Malta. This new platform will be bringing together the relevant stakeholders to promote the use of bicycles in Malta and to implement the National Cycling Strategy and Action Plan.

8.9 Sustainable Urban Mobility Plan (SUMP) for Valletta

The aim of SUMPs is to tackle accessibility and traffic congestion problems at a local level. In consultation with local councils and other stakeholders, TM has identified a number of local transport hubs which necessitate improvement in transport mobility. This specific measure focuses on the implementation of the SUMP in Valletta and the neighbouring areas.

The Valletta Strategy, a SUMP carried out in Valletta between 2006 and 2010, was an initiative with the aim of reducing traffic congestion and improve accessibility and air quality in that area. This strategy included the extension of the existing pedestrian zones, reduced parking needs in Valletta, a Controlled Vehicular Access (CVA) System that was a ‘pay as you go’ system and alternative means of transport and connecting different areas of the Capital City. The Valletta Strategy led to a 10% modal shift from the use of private cars to alternative modes of transport. From this experience, it was noted that a SUMP cannot be developed only for one locality, but rather on a regional scale, which should be defined at a functional level.

Figure 12 clearly shows the large dependency on cars as the main mode of transport of Malta in 2010. In fact, the stock of licensed motor vehicles has been increasing throughout the years, as shown in Figure 23. The framework development for the introduction and implementation of SUMPs is included in the National Cycling Strategy and Action Plan as well as in the National Transport Master Plan 2025. Following recent analysis of regional mobility and trip demand the Valletta Extended Region has been developed for this framework. Since the SUMP must be created at a localised aspect, the two regions will have their own implementation plan made up of a set of policy related measures. The first SUMP to start its implementation in 2016 was the Valletta Extended Region. It includes the further integration of Marsamxett ferry landing place with the public transport network through a shuttle bus route and an option analysis to connect Marsamxett ferry landing site with Central Valletta (this is discussed in section 8.18). The SUMP also includes ITS applications to provide information in real time about the current conditions of the road and vehicles using the road (this is
discussed in section 8.17). Moreover, the Valletta SUMP includes the bike-sharing scheme which has already been implemented (this is discussed in Section 5.10.5).

![Stock of licensed motor vehicles](image)

### Figure 23 Stock of licensed motor vehicles (NSO, 2019)

#### 8.10 Last-mile delivery for Valletta

Valletta consists of an increasing number of catering establishments and boutique hotels, and is also the administrative centre of the island, therefore hosting a large number of offices. This means that the city experiences an increased demand for the delivery of goods within the city. Further to this, urban centres like Valletta frequently experience congestion as a result of the inefficient delivery of goods, illegal parking and air pollution problems due to the large and high polluting vehicles. To address this issue, a new project is being introduced in the Valletta Extended Region, the “last-mile delivery”. This consists of the delivery of goods from stores in Ta’ Qali, which are then collectively delivered to Valletta using an electric van. This will be reducing the congestion caused by freight transport in the region since the vehicle is shared for various deliveries. This in turn improves the quality of life of the residents and visitors, and reduces the impact on air quality.

#### 8.11 Smart parking system for Valletta

Vehicle access to Valletta is limited due to the restricted car space available, few parking spaces and limited by road pricing. Because of this, car drivers end up roaming around the city to try and find a parking spot, which in turn causes congestion, pollution and a waste of time and resources. This new system will be providing real-time information on the available
parking spaces, avoiding the need for car drivers to go around the city to try and find a parking. Around 850 sensors will be installed, and this system will be integrated in the SUMP of Valletta\(^\text{15}\).

8.12 Pilot cycling corridors

Pilot cycle corridors have been selected in the main ‘hub’ area based on the potential of achieving a modal shift from car to other sustainable modes of transport. Moreover, this selection was further encouraged by the fact that the topography of the selected region consists of low-lying surroundings, making it easier to cycle. The two possible pilot cycle corridors are between:
- Valletta and St. Julian’s and
- Mosta and Mater Dei

\[^{15}\text{https://civitas.eu/projects/destinations/measures-smart-parking}\]
The pilot cycling corridor route St. Julian’s to Valletta will allow commuters to travel to Valletta and back, and will also allow the commuters to travel to their destination by using cycling and ferry services in combination since this route would link to the St. Julian’s ferry landing site, Sliema’s ferry landing site and ta’ Xbiex/Msida ferry landing site.

8.13 Develop a shore supply action plan for the TEN-T ports

Both the TM Master Plan 2025 and the National Policy Framework Alternative Fuels Infrastructure for Transport in Malta (2018 – 2023) include considerations for shore-supply infrastructure for berthing vessels in the Maltese harbours. An action plan for the two ports (Valletta and Marsaxlokk) will be developed to assess whether shore supply is feasible. The availability of shore supply infrastructure has a number of environmental benefits, including the reduction of air, sea and noise pollution. The implementation for such measure is envisaged between 2016 and 2020 (TM, 2016). The MNEP carried out a feasibility study on the technology which is being reviewed due to current development in the sector.

8.14 Introduction of electric buses in Gozo

Gozo will be introducing six electric buses on the island which will serve as a mode of mass transportation between the Park and Ride in Xewkija and Mgarr Harbour. The Park and Ride project will itself facilitate emission reduction from vehicles since the kilometres travelled per conventional vehicle using the Park and Ride would be reduced. The Park and Ride will be equipped with charging points for the electric buses. In November 2018, the Ministry for Gozo issued a tender for the delivery and commissioning of six fully electric powered buses.

8.15 Infrastructure interventions

Infrastructure Malta (IM) is responsible with the development, maintenance and upgrading of the road network and other public infrastructure in the Maltese Islands. Major infrastructural interventions are planned to be implemented within the next decade. These infrastructural projects will accommodate the increasing traffic flows when roads experience heavy traffic, thus reducing queuing times and alleviate congestion. As indicated in TM Master Plan, infrastructural provisions should be linked to improvements in bus service, cycling and walking infrastructure.

8.16 Public Transport Quality Corridors (PTQC)

The current public transport system could be improved by the creation of Public Transport Quality Corridors (PTQCs) along a selected network. Several bus corridors have been identified that require further actions, and are listed in Table 3 below. The idea of a PTQC is to dedicate road space to public transport routes and removing obstructions, improve reliability and journey times of public transport routes, improve monitoring of operations along these corridors, traffic signal control to favour buses, improved quality of bus shelters,
provision of real time information system and improved service on-board buses. These in turn improve accessibility, attracting new passengers and thus increasing its usage and reducing traffic congestion and air pollution. In total, 22 bus shelters were installed in different localities in Malta (Malta NRP, 2019).

Table 3 Key Corridors to be developed into Public Transport Quality Corridors (TM, 2016)

<table>
<thead>
<tr>
<th>Public Transport Quality Corridors</th>
<th>Implementation period</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT 1 Sliema – Msida – Valletta</td>
<td>2016 – 2020</td>
</tr>
<tr>
<td>PT 2 Tarxien – Fgura – Marsa – Valletta</td>
<td>2016 – 2020</td>
</tr>
<tr>
<td>PT 3 Mosta – Birkirkara – Msida – Valletta</td>
<td>2021 – 2025</td>
</tr>
<tr>
<td>PT 4 Naxxar – Birkirkara – Ħamrun – Valletta</td>
<td>2021 – 2025</td>
</tr>
<tr>
<td>PT 5 Mosta – Birkirkara – University – Msida</td>
<td>2021 – 2025</td>
</tr>
<tr>
<td>PT 6 Attard – Birkirkara – Ħamrun – Valletta</td>
<td>2021 – 2025</td>
</tr>
<tr>
<td>PT 7 Qormi – Ħamrun - Valletta</td>
<td>2021 – 2025</td>
</tr>
</tbody>
</table>

8.17 Increase the use of Intelligent Transport Systems in traffic management

Intelligent Transport System is one of the four main components of the MODUS Project. The MODUS Project encourages a modal shift in land transportation, by making public transport more efficient and reliable. This system provides real-time information on the current conditions of the road and vehicles on the road, with the aim of increasing the performance and improve the safety of the road network. Road users can be notified by various methods, including message signs, radio and internet, and consequently they can adapt their journey at short notice, according to the notifications provided. This measure also aims to further improve the ITS for public transport, by increasing road-side cameras and incorporating them into the new National Traffic Control Centre, by installing more Dynamic Message Signs (DMS) to notify road users and a web-based application providing real-time information journey planning information for public transport. Phase two of this measure is currently being deployed and the relevant scenarios will be outlined through the completion of the ITS Action Plan. It is planned that the implementation timeframe of this measure is extended to 2030.

8.18 Improvement of Ferry Landing Places

Transport Malta is currently working on the first phase to improve the ferry-landing sites at Sliema, Valletta, Marsamxett and Cottonera. Upgrades include the inclusion of ferry landing places with the public transport network and alternative modes of transport and the improved provision of information or updates on bus and ferry schedules. The second phase of this measure, which shall start in 2020, will entail further studies on additional landing sites so as to further extend the service. Sea connections will further extend to Marsaxlokk, Marsascala, St. Paul’s Bay, St. Julian’s, Mellieħa, and other sites (Ministry for Finance, 2019).

8.19 Fast ferry link between Malta and Gozo
In addition to the measure discussed above, there are ongoing discussions for a fast ferry link between Malta and Gozo. This would reduce a number of vehicles from the roads and would at the same time encourage the use of a collective transport system for Gozitans who need to go to Valletta or in the vicinities. The implementation period for the fast ferry link is being envisaged from 2020 to 2030.

8.20 Initiatives related to electrification of the fleet

By the end of 2015, Malta had 246 registered electric cars and some 439 hybrid vehicles which result in lower emissions at the point of use. The take up of hybrid and electric cars in Malta is therefore behind European averages and more efforts are needed to incentivise the uptake of these low and zero-emission vehicles.

Towards the end of 2017, the Maltese Government decided that a cut-off date for the importation and registration of conventionally fuelled vehicles on the Maltese Territory needs to be established and targets need to be set. This is similar to what other EU Countries are doing with respect to the phasing out of conventionally fuelled vehicles. So as to assess and move forward towards the achievement of such targets, a committee was set up by the Minister for the Environment, Sustainable Development and Climate Change which is chaired by ERA and comprising members from MESDC, EWA, TM, MTIP and MRA.

The e-CAR committee has been assigned the task of:

- Drafting the consultation document on the cut-off date for the implementation of all ICE imports in Malta;
- Conducting close consultations with policy makers and relevant stakeholders involved;
- Submitting recommendations to Minister for Cabinet approval;

While carrying out its task, the committee needs to assess the different impacts that such a cut-off date may have on various fronts, including economic, infrastructural, environmental and social impacts.

A study has been commissioned to assist the committee in such an assessment through which informed decisions on a national level may be taken in this regard. Work to date has involved the analysis of statistical information, together with national and EU-wide studies where the natural progression towards having a larger fleet consisting of no ICE vehicles has been determined. The next steps will involve the utilisation of such ‘baseline data’ to arrive at possible cut-off dates for the importation of conventionally fuelled vehicles.

Besides increasing the number of charging points around Malta and Gozo, cheaper electricity tariffs (€0.1298 per unit) will be introduced when individuals charge their electric vehicles within their residential homes (Ministry for Finance, 2019).
8.20.1 Electric Vehicles (taxis and Government fleet)

In addition to current efforts related to establishing a cut-off date for the importation of Internal Combustion Engine (ICE) vehicles, and in the light of the recent Climate Change motion, it is being proposed that the Maltese Government will set a date by when taxis will become electric.

In addition, Government vehicles are also to become fully electric by a set date, so as to lead by example.

8.21 Increase in financial grants for more efficient internal combustion engines (ICE)

To ensure a higher uptake of cleaner vehicle technology, it is being proposed that financial grants for the purchasing of cleaner ICE vehicles when the older vehicle is scrapped will be increased. Such a measure will eventually lead to a rejuvenation of the age of the fleet whereby more efficient technology of the newer vehicles will lead to a reduction in emissions. The current system is considered to be adequate, whereby the lower the emissions of the new vehicle, the higher is the grant. Government might also consider carrying out a financial feasibility study to verify at which level the grant will truly incentivise a phasing out of older vehicles. The grant should also be provided even if the user opts not to purchase a new vehicle.

8.22 Reform of Public Service Garages

Transport Malta regulates the registration and licensing of garage hire (chauffeur-driven) vehicles, vehicles for hire or lease, and operators of such vehicles under one licensing regime termed the Public Service Garage Permit System. The current framework lacks service standards that should be expected from operators, drivers and their vehicles, and needs to be updated to cater for new technological developments (Transport Malta, n.d.).

The reform of the public service garage regime includes changes that will improve air quality. These include the introduction of a maximum age limit after the date of registration of 10 years for leased vehicles. This is considered to be positive from an air quality perspective since these cars are used for long hours during the day, therefore produce more emissions than a normal passenger car. In the case of leased taxi/chauffeur-driven passenger vehicles, setting a maximum age limit is also being considered.

Industry

8.23 Environmental Authorisations Regulations

The ERA is currently working on draft regulations related to the authorisation of specific activities which give rise to emissions to the air, water or land. These regulations provide a
framework for environmental authorisations laying down the thresholds, procedure and guidance for the Authority to authorise and regulate any activity, operation, intervention, project or land use that may have an effect on the environment. The legislation covers activities and operations which are currently not covered by the EU or local legislation, however their cumulative effect is considered to be important to air quality and national emissions.

The activities which will be covered by these Regulations, which might give rise to emissions to the air, and for which an authorisation is required, include, amongst others:

- Industrial Zones, Industrial Complexes, SMEs and SME Complexes;
- Crematoria;
- Manufacture of refined petroleum products;
- Wholesale and retail of solid, liquid and gaseous fuels and related products;
- Fuel terminals;
- Storage and Distribution of Petrol from Terminals to Service Stations;
- Retail sale of fuel, operation of fuel road tankers;
- Manufacture of asphalt and concrete products;
- Quarrying operations, cutting, shaping and finishing of stone;
- Manufacture of pharmaceutical products and pharmaceutical preparations excluding production of APIs and Intermediates excluding repackaging only;
- Repair and maintenance of small vehicles, vessels, aircraft and other transport equipment exceeding 3 tonnes/unit on average;
- Installations emitting VOCs

A set of operating permit conditions will be determined by the Authority following submission of an application by the operator. Provisions include operating conditions on emission to air, effluent discharges, emissions to land, waste storage, acceptance, handling and treatment. The operator will be obliged to report to the Authority according to its monitoring programme. The Authority can direct the operator to improvement programmes, depending on the progress noted during inspection and enforcement activities.

The adoption and entry into force of the Regulations is envisaged during the period 2020 onwards.

8.24 A more sustainable construction industry

Malta Enterprise will be incentivising operators in the industrial sector to scrap their old polluting machinery and invest in environment friendly machinery that decreases pollution. The grant is of a maximum of €200,000. In addition, operators who invest in additional machinery to reduce the negative impact on the environment will also be eligible for this grant (Ministry for Finance, 2019).
Agriculture

Ammonia emission reduction measures from the agricultural sector

As per Annex III of the NEC Directive, every Member State shall set forth emission reduction measures related to the agricultural sector. In addition to the agricultural measures described in Section 5, further measures are envisaged for implementation in the National Agricultural Policy (NAP) for the Maltese Islands (2018-2028). The NAP was developed following a strategic review on the sector, carried out in 2013. The review focused on a detailed economic analysis, on the relevant documentation and in consultation with the relevant stakeholders. The NAP was established with the aim of making the Maltese agricultural sector a sustainable one. The following measures, stemming from the NAP, shall likely conduce to a reduction in the formation of nitrates, which would lead in a reduction of ammonia emissions.

8.25 The creation of sustainable alternative strategies related to livestock waste management including treatment of by-products

This measure includes the implementation of the Agricultural Farm Waste Management Plan and the identification of possible solutions to turn farm waste into a resource. The agricultural sector is encouraged through the NAP to transform waste into resources, thus moving towards a circular approach. As mentioned in Section 5.16, the Governance of Agricultural Bio-Resources (MESDC) was set up in 2017 and its overall mission is to sustainably manage agricultural bio-resources in a manner that supports the Maltese agricultural sector. GAB is also in charge of updating, co-ordinating and implementing the Agricultural Waste Management Plan for Malta.

The GAB is currently working on a major research project on the sustainable management of animal manure and slurry, turning it into clean water. This project should avoid the disposal of thousands of tonnes of farmyard waste every year. As a result of reusing manure (and not left piled up on the fields), it would lead to less ammonia emissions since manure is not subjected to ammonia volatilisation.

8.26 Amendment to S.L. 549.66 for the utilisation of spent mushroom substrate

In 2018, an amendment was made to S.L. 549.66 on the Nitrates Action Programme Regulations whereby it included provisions for the use of soil conditioners, which is used to improve the soil’s properties. If spent mushroom substrate fulfils the requirements of these provisions, this substrate could be used as soil conditioner.

8.27 Develop a Soil Action Plan
Various soil conservation measures identified in the Agricultural Policy in the National Biodiversity Strategy and Action Plan will be incorporated in a Soil Action Plan that is required to address these goals in terms of how to mitigate the threats to Maltese soils and adopt measures aimed at integrated soil conservation. The Soil Action Plan together with other national relevant policies shall contribute towards the requirements of the Convention to Combat Desertification (UNCCD) to develop desertification national action programmes.

The development of the Soil Action Plan involves the pertinent stakeholders, including but not limited to, measures that:

a. Support initiatives at the field level which contribute towards improved soil quality thereby improving its moisture retention ability as well as its nutrient content;

b. Promote the use of steam soil sterilizers for the sterilization of farmland that could assist in the reduction of soil borne diseases and nematodes;

c. Improve knowledge on Maltese soils by updating the available pedological data;

d. Incentivize processes and practices on the build-up and maintenance of soil organic matter, the enhancement of soil biodiversity, the reduction of soil erosion, compaction and contamination;

e. Assess the impact of correct application of manure and other organic matter in Malta’s soils particularly on the level of nitrates in order to ensure effective implementation of the Nitrates Directive and align the plan with the farm waste management plan.

Energy Demand

8.28 Projects in primary water network

The Water Services Corporation is the authority responsible for the supply of water across Malta and Gozo, and takes care of the disposal of waste water. Groundwater sources in Malta are not enough to meet the current demand, therefore Reverse Osmosis is used to convert seawater into high-purity drinking water. The converted sea water is then blended with groundwater. There are three Reverse Osmosis plants; in Pembroke, in Ċirkewwa and in Ghar Lapsi. There are currently ongoing works at the Pembroke Reverse Osmosis Plant, where a 9.5km tunnel is being drilled from the plant to the Ta’ Qali Reservoirs. This project will improve the overall water quality and will also improve the operation efficiency and environmental sustainability. This means that less water is pumped and therefore saving electricity generated for pumping.

8.29 Biofuels Substitution Obligation (2021-2030)

Further to Section 5.24, and in line with Article 25 of the recast of Directive 2009/28/EC on the promotion of the use of energy from renewable sources, Malta will extend the substitution obligation to 2030. The share of renewable energy supplied for final consumption in the road transport sector must increase to at least 14%, while the share of advanced biofuels must increase to at least 3.5% by 2030 (EWA, 2018).
8.30 Development of Research & Innovation Strategy for Energy and Water

MCST is expected to develop a new national Research & Innovation (R&I) strategy by the end of 2020, covering the period 2021-2030, with smart specialization remaining a key component. This implies that a bottom-up approach, focused on stakeholder consultations, will be the prevalent approach for selecting future areas of investment for R&I. The inclusion or otherwise of low-carbon technologies in the next national general R&I strategy covering the period up to 2030 will depend on the outcome of the Smart Specialisation and Entrepreneurial Discovery Process.

In order to foster research & innovation specifically in the area of energy and low-carbon technologies, a separate strategy for R&I specific to the energy and water sectors is expected to be developed by the end of 2019 by EWA. This new strategy will aim to boost research and innovation efforts by the public and private sectors in the next decade.

The National Energy Policy (2012) focused on the RES in terms of R&I purposes, specifically on technologies relevant to solar and marine resources. This objective is also reflected in Malta’s National Renewable Energy Action Plan (2017), where the R&I is being further encouraged in the development and commercialisation of RES technology, also focusing on the solar and marine resources.

8.31 Waste to Energy Facility

In 2017, the Government decided that the Waste-to-Energy (WtE) facility was to be an integral option to the long-term sustainable management of Municipal Solid Waste. The concept of the WtE facility is to limit the rate of landfilling and recover the energy produced by the remaining fraction of waste that is beyond the targets. Even if EU 2020 targets are achieved (MESDC, 2018), (which are to recycle 50% of paper, plastics, metal and glass waste from households by 2020, and to allow only 35% of biodegradable municipal waste, based on 2002 levels, to be landfilled), it is acknowledged through Malta’s Waste Management Plan (2014-2020) that a considerable amount of residual waste would still need to be landfilled or further treated through a WtE facility. The development of a WtE facility is being earmarked as a major project in Malta (MESDC, 2018).

The new WtE facility will therefore reduce non-GHG emissions from landfill, whilst emissions from the stack will be controlled to minimise the effect of emissions on residents of nearby settlements. Once in operation, the facility will be regulated by ERA and will operate under the emission requirements of the Industrial Emissions Directive and thus according to the Best Available Techniques (BAT).

8.32 Financial incentives to increase the use of Renewable Energy Sources and promote energy efficiency
The Government is extending already-existing support schemes beyond 2020 with the aim of increasing the use of renewable energy sources mainly through solar PV and solar water heaters (SWH) (NECP, 2018).

8.32.1 Financial support schemes for Solar PVs

The existing schemes, focusing on a grant and operating aid for households, will be extended beyond 2020 with the aim of increasing the deployment of renewable energy. The Government also intends to design schemes to encourage battery integration in PV systems where appropriate.

8.32.2 Engagement of stakeholders for increased deployment of renewable energy sources

Key stakeholders will be encouraged to be involved in the increased deployment of renewable energy technologies as from 2021. Banks shall be encouraged to provide preferential loans for the deployment of renewable energy installations whilst private investors shall be encouraged to adopt financing models which provide opportunities for households who do not have access to private rooftops to participate in investments in green technology. Similarly, discussions shall be held with construction developers so as to integrate RES within their projects.

8.32.3 Solar Water Heaters Scheme

Further schemes on solar water heaters in the residential sector will be introduced post-2020. Malta intends to provide support for the installation of 1,500 SWH per year by 2030.

8.32.4 Energy efficiency: electricity tariffs

Electricity tariffs are intended to promote energy efficiency among consumers. Residential electricity tariffs post 2020 shall continue to incorporate a built-in mechanism which will incentivise end-users to reduce consumption below an established threshold and deter high consumption by applying a rising block tariff. The objective of this measure is to reach the 2030 energy efficiency contribution. The implementation period for this measure is 2021 – 2030.

8.32.5 Support scheme for Services and Industry

Services and Industry will be offered support schemes as from 2022 to promote and address energy efficiency investment.
8.32.6 Energy Efficient Street Lighting

Around 33,000 lamps from the present lighting luminaries are expected to be replaced by energy efficient LEDs. This project has started in 2018 and is expected to be finalised by 2022.
9. STAKEHOLDER AND PUBLIC CONSULTATION

9.1 Stakeholder consultation

The NAPCP was finalised following extensive consultations carried out with various authorities, Ministries and public bodies. The bodies consulted were the following:

- Transport Malta
- Energy and Water Agency
- Agricultural Directorate
- Agriculture and Rural Payments Agency
- Diversification and Competitiveness Directorate
- Governance of Agriculture Bio-Resources
- E-Cars Committee
- Malta Resources Authority
- Environmental Health Directorate
- Eco-Gozo
- Malta Public Transport
- Ministry for Finance

In addition, the authorities and Ministries directly involved in the implementation of the measures are outlined in Annex 2.

9.2 Public consultation

A public consultation on the aims and objectives of the NAPCP was held during the period between 22nd March and 19th April 2019 (consultation brief can be found in the following link: https://era.org.mt/en/Documents/Intent%20Consultation%20brief_NAPCP.pdf). The submissions received were taken into consideration during the drafting of the NAPCP and are outlined in Annex 3.
## 10. POLICIES AND MEASURES SELECTED FOR ADOPTION IN THE ‘WAM’ SCENARIO

The following measures are selected for adoption in the WaM scenario.

*Table 4 PAMs/Packages of PAMs selected for adoption in the ‘WaM’ Scenario*

<table>
<thead>
<tr>
<th>Measure no.</th>
<th>Name of PAMs/package of PAMs</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.6</td>
<td>Vehicle tracking for public transport</td>
</tr>
<tr>
<td>5.7</td>
<td>Facilitate the development of a real-time multi-modal journey planner</td>
</tr>
<tr>
<td>5.10.5</td>
<td>Bike sharing schemes</td>
</tr>
<tr>
<td>8.1</td>
<td>Free school transport</td>
</tr>
<tr>
<td>8.2.1</td>
<td>Tallinja Capping System</td>
</tr>
<tr>
<td>8.2.2</td>
<td>IoScoot: An electric motorbike sharing service</td>
</tr>
<tr>
<td>8.2.3</td>
<td>Tallinja Ferry Service</td>
</tr>
<tr>
<td>8.2.4</td>
<td>TD Plus</td>
</tr>
<tr>
<td>8.3a</td>
<td>Free Public Transport fares for youths and students (phase 1)</td>
</tr>
<tr>
<td>8.3b</td>
<td>Free Public Transport fares for youths and students (phase 2)</td>
</tr>
<tr>
<td>8.3c</td>
<td>Free Public Transport fares for youths and students (phase 3)</td>
</tr>
<tr>
<td>8.4</td>
<td>Develop and incentivise schemes to promote multiple occupancy</td>
</tr>
<tr>
<td>8.5a</td>
<td>Review of Malta’s National Electro-Mobility Action Plan (MNEAP) (phase 1)</td>
</tr>
<tr>
<td>8.5b</td>
<td>Review of Malta’s National Electro-Mobility Action Plan (MNEAP) (phase 2)</td>
</tr>
<tr>
<td>8.6</td>
<td>Car sharing scheme</td>
</tr>
<tr>
<td>8.7</td>
<td>Study the introduction of Low Emission Zones</td>
</tr>
<tr>
<td>8.8</td>
<td>Develop a national bicycle strategy</td>
</tr>
<tr>
<td>8.9</td>
<td>Sustainable Urban Mobility Plan (SUMP) for Valletta</td>
</tr>
<tr>
<td>8.10</td>
<td>Last mile delivery for Valletta</td>
</tr>
<tr>
<td>8.11</td>
<td>Smart parking system for Valletta</td>
</tr>
<tr>
<td>8.12</td>
<td>Pilot cycling corridors</td>
</tr>
<tr>
<td>8.13</td>
<td>Develop a shore supply action plan for the TEN-T ports</td>
</tr>
<tr>
<td>8.14</td>
<td>Introduction of electric buses in Gozo</td>
</tr>
<tr>
<td>8.15</td>
<td>Infrastructure interventions</td>
</tr>
<tr>
<td>8.16</td>
<td>Public Transport Quality Corridors (PTQC)</td>
</tr>
<tr>
<td>8.17a</td>
<td>Increase the use of Intelligent Transport systems in traffic management (phase 1)</td>
</tr>
<tr>
<td>8.17b</td>
<td>Increase the use of Intelligent Transport systems in traffic management (phase 2)</td>
</tr>
</tbody>
</table>
8.18a Improvement of Ferry Landing Places (phase 1)
8.18b Improvement of Ferry Landing Places (phase 2)
8.19 Fast ferry link between Malta and Gozo
8.20 Initiatives related to electrification of the fleet
8.20.1 Electric Vehicles (taxis and Government fleet)
8.21 Increase in financial grants for more efficient internal combustion engines (ICE)
8.22 Reform of Public Service Garage
8.23 Environmental Authorisation Regulations
8.24 A more sustainable construction industry
8.25 The creation of sustainable alternative strategies related to livestock waste management including treatment of by-products
8.26 Amendment to S.L. 549.66 for the utilisation of spent mushroom substrate
8.27 Develop a Soil Action Plan
8.28 Projects in primary water network
8.29 Biofuels Substitution Obligation
8.30 Development of R&I Strategy for Energy and Water
8.31 Waste to Energy facility
8.32.1 Financial support schemes for Solar PVs
8.32.2 Engagement of stakeholders for increased deployment of Renewable Energy Sources
8.32.3 Solar Water Heaters Scheme
8.32.4 Energy Efficiency: electricity tariffs
8.32.5 Support scheme for Services and Industry
8.32.6 Energy Efficient Street Lighting

Emissions projections for the measures in Table 5 were carried out based on the activity data available, and are specified below.

**Road Transport:**

This sector involved the compilation of a road transport model (by the Energy and Water Agency) which includes the change in fleet composition with time. The policy scenario of this model takes into consideration the change in kilometres travelled as a result of a number of sustainability and road infrastructure measures.

**Energy Demand:**
The quantification of emission reduction from other sectors was possible where projections on fuel used (sourced from EWA) were available. Measures projected under this category are measures 8.28 to 8.32.6 (excluding measure 8.31).

**Waste to Energy facility:**

Data on the quantification of the impact of this measure (section 8.31) was obtained from MESDC.

**Other measures not modelled at the time of writing:**

Emission reductions related to specific measures was not possible when detailed information was not available at the time of assessment, since the project would be at its early stages. Measures that are not modelled are measures 8.23, 8.24, 8.25, 8.26 and 8.27.

10.1 **Assessment of road transport measures**

**Road Transport:**

As indicated earlier on in the NAPCP, the focus of this programme is on traffic measures. An assessment of the various policy scenarios considered in the National Transport Masterplan 2025 has been carried out at the time of issuing of the plan in December 2016, with the base year of assessment being 2014. The following is a summary of the outcome of the assessment, as laid down in the National Transport Masterplan, 2025. This assessment forms the basis of which traffic measures were selected for adoption in the WaM scenario:

Three economic indicators were used for this assessment:

1. Benefit-cost ratio (BCR), which provides a ratio of discounted benefits and costs.
2. The Economic Net Present Value (ENPV), which provides the total amount of benefits and costs at the end of a project’s life span (in this case 2050), accounting amongst other factors inflation with time.
3. The Economic Internal Rate of Return (EIRR), works along with the ENPV. However, this indicator takes into account the initial investment.

The following four options were studied:

1. Do-nothing scenario

2. Do-minimum scenario: This scenario modelled measures which were already implemented by the base year, at measures committed up to 2020.

3. Do-Something 1 (DS1):
a. Implement a number of road infrastructure projects aimed at removing traffic bottlenecks at nodes and urban communities (referred to as RD1 to RD6 in the Masterplan). A number of indicators were used to assess the BCR, ENPV and EIRR for RD3, RD5 and RD6, namely: peak hour travelled distance for private and public vehicles, modal split, peak hour light vehicles and public transport average speed, cost of congestion, cost of accidents, CO₂ and air pollutant emissions (using Tier 1 emission factors, fuel consumption per km and distance travelled by vehicle per vehicle type).

b. Implement two corridors for public transport for high passenger load, journey planners, real-time vehicle tracking systems, improving interchange facilities.

c. Improve frequency of ferry from 30 minutes to every 20 minutes.

d. Implement a cycling corridor from Valletta to Sliema to reach 35km of corridors.

e. Implement a low emission zone in the Valletta-Sliema hub which charges €1 for entry for vehicles which are over 20 years old and which are pre-EURO and EURO I (model predicts that private vehicles will pay 19% of the fee, and heavy vehicles will pay 39% of the fee).

f. Carpooling and High-occupancy vehicle lanes that increase current 1.2 pax/veh to 1.3 pax/veh.

4. Do-Something 2 (DS2):
   a. Implement RD1, RD2, RD3, and RD6. R6 and R3 were preferred over R4, as these were located in busy urban areas, and these were designed specifically to aid cycling and walking.

b. Implement seven corridors for public transport.

c. Improve frequency of ferry from 30 minutes to every 15 minutes.

d. Implement a cycling corridor from Sliema to Valletta to Fgura that reaches 42km.

e. Implement a low emission zone in the Valletta-Sliema hub which charges €1 for entry for vehicles which are over 15 years old and which are pre-EURO, EURO I or II (model predicts that private vehicles will pay 40% of the fee, and heavy vehicles will pay 60% of the fee).

f. Carpooling and High-occupancy vehicle lanes that increase current 1.2 pax/veh to 1.4 pax/veh.

g. Replace 12 out of 33 buses in Gozo with electric buses.

h. Fast ferry between Malta and Gozo. This currently does not exist, therefore the demand was induced as a reduction of 300 vehicles at peak hour. Freight vehicles would in turn be transported once daily (per direction) that results in a decrease of 36 medium/heavy goods vehicles per day.

The indicators used for DS1 and DS2 are the following:

- Peak-hour travelled distance [vkm] – number of private vehicles in link and length of link
- Modal split – percentage of vehicle type use
The following table summarises the outcome of the study:

<table>
<thead>
<tr>
<th></th>
<th>Do-Something 1 (€m)</th>
<th>Do-Something 2 (€m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socioeconomic benefits</td>
<td>1,626.68</td>
<td>2,814.55</td>
</tr>
<tr>
<td>Congestion time savings</td>
<td>1,282.43</td>
<td>2,161.28</td>
</tr>
<tr>
<td>Consumption at idle savings</td>
<td>96.69</td>
<td>161.89</td>
</tr>
<tr>
<td>Externalities - environmental costs savings</td>
<td>32.31</td>
<td>63.14</td>
</tr>
<tr>
<td>Externialities - accidents savings</td>
<td>215.25</td>
<td>428.24</td>
</tr>
<tr>
<td>Operation and maintenance costs</td>
<td>-159.98</td>
<td>-150.91</td>
</tr>
<tr>
<td>Investments (including RD1 and RD2)</td>
<td>-474.64</td>
<td>-401.67</td>
</tr>
<tr>
<td>ENPV (€m)</td>
<td>992.06</td>
<td>2,261.97</td>
</tr>
<tr>
<td>EIRR (%)</td>
<td>12.94</td>
<td>24.53</td>
</tr>
<tr>
<td>BCR</td>
<td>2.56</td>
<td>5.0</td>
</tr>
</tbody>
</table>

The Do-Nothing scenario delivered the least economic and environmental benefits, and was therefore discarded. The Do-Minimum scenario showed that it is not effective as DS1 and DS2, therefore it was used as a baseline. The BCR value was above 1 for both DS1 and DS2, meaning that both options provided more benefits than costs; with the Do-Something 2 option resulting in a higher benefit ratio. The ENPV values for both options were positive, and thus both are expected to bring benefits. However, the Do-Something 2 option had a higher value, thus it is expected to bring more benefit. Both scenarios bring a positive value to the EIRR, however, the EIRR value for Do-Something 2 is significantly higher than that of Do-Something 1.

In conclusion, the combination of the three economic indicators shows that Do-Something 2 provides a greater benefit than Do-Something 1.

In early 2019, Transport Malta performed an update of the national transport model. The base year was updated from 2014 to 2017, taking into consideration all changes in infrastructure, public transport systems, land use patterns and transport policies since 2014. Following this update, the modelling of future scenarios was also performed for 2020, 2025
and 2030, taking into consideration the demand forecast, for two supply scenarios which are used as a basis to analyse future transport interventions:

- **Do-Nothing scenario**: a reference scenario which includes all the recently implemented and committed developments up to 2018;
- **Do-Something scenario**: includes the road infrastructure projects and sustainability interventions planned up to 2020, 2025 and 2030.

Sustainability interventions are aimed at improving the efficiency of the transport system and including a number of measures building on the DS2 2014 scenario, and including additional measures which are further described in Chapter 8. The resultant reduction in annual vehicle kilometres as a result of the implementation of transport measures could not be quantified for all measures. This is due to the fact that the relevant information was not available at the time of modelling, and specific data gathering exercises and/or studies are necessary as input to the transport model. Consequently, it was not possible to calculate emission savings from each measure, however emissions savings could be calculated for one ‘package’ of measures as follows:

**Package 1 – Measures modelled by Transport Malta**

The modelling exercise carried out by TM in February 2019 quantified the reduction in vehicle km through the implementation of Measures 5.6, 5.7, 5.10.5, 8.1, 8.3, 8.11, 8.15, 8.16, 8.17, 8.18, 8.19. Measure 8.7 was modelled for 2025 and 2030 as per DS2 conditions outlined earlier on in this Chapter. However, it is being proposed to implement this measure in 2020, rather than 2025.

**Package 2 – Measures not modelled at the time of writing**

The second package of measures which is being reported will be assessed in 2020, when the Transport Masterplan is due for mid-term review. This assessment will be informed by an updated National Household Travel Survey which will provide valuable updated information as input data to the model. Transport measures that are not modelled are measures 8.2.1, 8.2.2, 8.2.3, 8.4, 8.5, 8.6, 8.8, 8.9, 8.10, 8.12, 8.13, 8.14, 8.20, 8.20.1, 8.21 and 8.22.

10.2 **Projections for the WaM Scenario**

Table 6 below displays Malta’s emission reduction commitments for 2020 and 2030 for NOx, NMVOC, SO2, NH3 and PM2.5, and the projected emissions of these pollutants for years 2020 and 2030, taking into account the WaM scenario.

<table>
<thead>
<tr>
<th>Pollutants</th>
<th>2017 emissions in kt</th>
<th>2020 ceilings in kt</th>
<th>Projections for year 2020 in kt</th>
<th>2030 ceilings in kt</th>
<th>Projections for year 2030 in kt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. 1</td>
<td>No. 2</td>
<td>No. 3</td>
<td>No. 4</td>
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</tr>
<tr>
<td>NOx</td>
<td>5.37</td>
<td>5.4</td>
<td>5.25</td>
<td>2</td>
<td>4.47</td>
</tr>
<tr>
<td>NMVOC</td>
<td>3.45</td>
<td>2.5</td>
<td>3.07</td>
<td>2.86</td>
<td>2.6</td>
</tr>
<tr>
<td>SO2</td>
<td>0.63</td>
<td>2.53</td>
<td>0.11</td>
<td>0.56</td>
<td>0.13</td>
</tr>
<tr>
<td>NH3</td>
<td>1.13</td>
<td>1.5</td>
<td>1.19</td>
<td>1.3</td>
<td>1.18</td>
</tr>
<tr>
<td>PM2.5</td>
<td>0.32</td>
<td>0.98</td>
<td>0.32</td>
<td>0.35</td>
<td>0.3</td>
</tr>
</tbody>
</table>

The projected emissions for 2020 for the WaM scenario demonstrate that SO$_2$, NH$_3$ and PM$_{2.5}$ will be in compliance with the emission reduction commitments as set in 2020 and 2030.

The projected NMVOC emissions in the WaM scenario exceed the 2020 emission reduction commitment, however, as per comment made in Section 7.1, there is a possibility that emissions from the 'Domestic Solvent Use including Fungicides' sector are overestimated. ERA is working to improve this sector with a view to also improve projected emissions. Once the methodology is improved, projections for NMVOC will be revised.

Although the WaM scenario focused on the major sources of NO$_x$ emissions, the reduction between the two scenarios was not sufficient to reach the emission reduction commitments. The major contributors to NO$_x$ projected emissions in 2030 are road transport (41.7%), followed by aviation (17%), manufacturing industry and construction (14.4%), public electricity and heat production (8.6%), commercial, institutional and residential (7.6%) and others (national navigation, waste, plant production and agricultural soils sectors).
11. ASSESSMENT OF HOW SELECTED POLICIES AND MEASURES ENSURE COHERENCE WITH PLANS AND PROGRAMMES SET UP IN OTHER RELEVANT POLICY AREAS

The selected policies and measures were assessed in the light of coherence with the following:

**Air Quality objectives**

The main challenge for ambient air quality in the Maltese Islands is road transport. Malta had registered exceedances of the NO\(_2\) hourly limit value in 2011 and PM\(_{10}\) daily limit value in 2010 in the agglomeration, more specifically from the traffic site. For this reason, an air quality plan was designed and published by the then MEPA in 2010\(^{16}\).

Since then no exceedances of any pollutant regulated by Directives 2008/50/EC and 2004/107/EC have been recorded, however the PM\(_{10}\) and NO\(_2\) levels in the same traffic site are too close for comfort. It is therefore evident that the focus of future measures is to be on road transport, especially in areas with heavy traffic. To this effect, the measures included in the NAPCP have been devised taking into consideration the Air Quality Plan of 2010, whilst performing an update of those measures in consultation with Transport Malta, which is the authority responsible for road transport in Malta. The update has taken into consideration new information available since 2010, such as traffic flow demand, measures implemented and measures for which a commitment has been made. In this way, it was ascertained that the measures included in the NAPCP will also benefit ambient air quality objectives, with a particular focus on pollutants generated by road traffic.

**Other plans and programmes**

A review of all national policies which might have an impact on air emissions has been carried out as a basis for the drafting of Malta’s NAPCP. Measures which could contribute to a reduction in any of the NEC pollutants has been included and classified as a ‘WM’ or WaM’ policy measure (where applicable), depending on a number of factors. Such policies include transport, energy, climate change and agricultural policies. The relevance of the measures to their respective national policy are outlined in Annexes 1 and 2.

The draft NECP has been an important reference during the drafting of the NAPCP. All measures outlined in the draft NECP have been taken into consideration when developing both WM and WaM emission projections, and during the selection of the measures themselves in the context of the NECD. Other important national policy documents are the National Transport Masterplan for 2025, and the Malta National Electro-Mobility Action Plan which was given due importance as a result of road transport being the major contributor to NO\(_x\) emissions in Malta.

A general assessment of possible positive and negative impacts of these measures was carried out, and the measures which were thought to deliver most benefit to the reduction of NEC pollutants were selected. In terms of any negative impacts, there is no specific measure which is thought to negatively impact any of the NEC pollutants, however a more detailed impact assessment might be necessary so as to confirm this.

In terms of the effect of the PaMs on other national policies, a general assessment has also been carried out in this respect. There is no specific measure in the NAPCP which is thought to effect other policies in a negative manner.

The Energy and Water Agency is working on the Strategic Environment Assessment (SEA) of the NECP. Conclusions emanating from this assessment will also provide information on the environmental benefits for measures which are common for both plans.
References


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Transport Malta. (2016). *National Transport Master Plan (2025).*


## Annex 1: ‘WM’ Scenario

<table>
<thead>
<tr>
<th>Measure no.</th>
<th>Name of PaMs</th>
<th>Relevant national policy</th>
<th>Implementation period</th>
<th>Authorities responsible for implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Shift to ultra-low sulphur fuel in power plants</td>
<td></td>
<td>2004</td>
<td>Enemalta Corporation</td>
</tr>
<tr>
<td>5.2</td>
<td>Reform in the power generation sector</td>
<td></td>
<td>2015</td>
<td>Enemalta Corporation</td>
</tr>
<tr>
<td>5.3</td>
<td>Closure of Marsa Power Station</td>
<td></td>
<td>2015</td>
<td>Enemalta Corporation</td>
</tr>
<tr>
<td>5.4</td>
<td>The ban of leaded petrol</td>
<td></td>
<td>2003</td>
<td></td>
</tr>
<tr>
<td>5.5</td>
<td>Public transport reform</td>
<td></td>
<td>2011</td>
<td>Ministry for Infrastructure, Transport and Communications</td>
</tr>
<tr>
<td>5.6</td>
<td>Vehicle tracking for Public Transport</td>
<td></td>
<td>2017</td>
<td>Transport Malta; Ministry for Transport, Infrastructure and Capital Projects</td>
</tr>
<tr>
<td>5.7</td>
<td>Facilitate the development of a real time multi-modal journey planner</td>
<td>Transport Master Plan 2025</td>
<td></td>
<td>Transport Malta; Ministry for Transport, Infrastructure and Capital Projects</td>
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<tr>
<td>5.8</td>
<td>Increase roadside checks and roadworthiness testing</td>
<td>Transport Master Plan 2025</td>
<td>2016-2020</td>
<td>Transport Malta; Ministry for Transport, Infrastructure and Capital Projects</td>
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<tr>
<td>5.9</td>
<td>The Kappara Junction</td>
<td>Transport Master Plan 2025</td>
<td>2016-2018</td>
<td>Transport Malta; Ministry for Transport, Infrastructure and Capital Projects</td>
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<tr>
<td>5.10.1</td>
<td>The scrappage scheme</td>
<td></td>
<td>2010 –</td>
<td>Malta National Electro-Mobility Platform; Transport Malta; Ministry for Transport, Infrastructure and Capital Projects</td>
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<tr>
<td>5.10.2</td>
<td>Gas conversion scheme</td>
<td></td>
<td>2013 –</td>
<td>Malta National Electro-Mobility Platform; Transport Malta; Ministry for Transport, Infrastructure and Capital Projects</td>
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<tr>
<td>5.10.5</td>
<td>Bike sharing schemes</td>
<td>Transport Master Plan 2025</td>
<td>2016 - 2030</td>
<td>Malta National Electro-Mobility Platform; Transport Malta; Ministry for Transport, Infrastructure and Capital Projects</td>
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<tr>
<td>5.10.6</td>
<td>Promoting multiple options not to travel during peak hours</td>
<td>Transport Master Plan 2025</td>
<td>2016 –</td>
<td>Transport Malta; Ministry for Transport, Infrastructure and Capital Projects</td>
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<td>5.11</td>
<td>Environment Permitting</td>
<td>N/A</td>
<td>2010 – 2019</td>
<td>Environment and Resources Authority; Ministry for the Environment, Sustainable Development and Climate Change</td>
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</table>
Annex 2: ‘WaM’ Scenario

<table>
<thead>
<tr>
<th>Measure no.</th>
<th>Name of PaMs</th>
<th>Relevant national policy</th>
<th>Implementation period</th>
<th>Review period</th>
<th>Authorities responsible for implementation</th>
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<tbody>
<tr>
<td>5.6</td>
<td>Vehicle tracking for public transport</td>
<td>Transport Master Plan 2025</td>
<td>2017 – 2030</td>
<td>Annual</td>
<td>Transport Malta; Ministry for Transport, Infrastructure and Capital Projects</td>
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<tr>
<td>5.7</td>
<td>Facilitate the development of a real-time multi-modal journey planner</td>
<td>Transport Master Plan 2025</td>
<td>2017 – 2030</td>
<td>Annual</td>
<td>Transport Malta; Ministry for Transport, Infrastructure and Capital Projects</td>
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<td>5.10.5</td>
<td>Bike sharing schemes</td>
<td>Transport Master Plan 2025</td>
<td>2016 – 2030</td>
<td>Annual</td>
<td>Malta National Electro-Mobility Platform; Transport Malta; Ministry for Transport, Infrastructure and Capital Projects</td>
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<td>8.1</td>
<td>Free school transport</td>
<td>N/A</td>
<td>2018 – 2030</td>
<td>Annual</td>
<td>Ministry for Education and Employment</td>
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<td>8.2.1</td>
<td>Tallinja’s Capping System</td>
<td>National Transport Strategy 2050</td>
<td>2015</td>
<td></td>
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<td>Project Description</td>
<td>National Transport Strategy</td>
<td>Year</td>
<td>Responsible Party</td>
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<td>8.2.2</td>
<td>IoScoot: an electric motorbike sharing service</td>
<td>National Transport Strategy 2050</td>
<td>2018</td>
<td>Malta Public Transport</td>
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<td>8.2.3</td>
<td>Tallinja Ferry Service</td>
<td>National Transport Strategy 2050</td>
<td>2017</td>
<td>Malta Public Transport</td>
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<td>8.2.4</td>
<td>TD Plus</td>
<td>National Transport Strategy 2050</td>
<td>2019</td>
<td>Malta Public Transport</td>
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<td>8.3a</td>
<td>Free Public Transport fares for youths and students (phase 1)</td>
<td>N/A</td>
<td>2017 – 2030</td>
<td>Annual Transport Malta; Malta Public Transport; Ministry for Transport, Infrastructure and Capital Projects</td>
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<tr>
<td>8.3b</td>
<td>Free Public Transport fares for youths and students (phase 2)</td>
<td>N/A</td>
<td>2018 – 2030</td>
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<td>8.3c</td>
<td>Free Public Transport fares for youths and students (phase 3)</td>
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<td>Start Date</td>
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<td>8.4</td>
<td>Develop and incentivise schemes to promote multiple occupancy</td>
<td>Transport Master Plan 2025</td>
<td>2021 - 2025</td>
<td>Annual</td>
<td>Transport Malta; Ministry for Transport, Infrastructure and Capital Projects</td>
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<td>8.5b</td>
<td>Review of Malta’s National Electro-Mobility Action Plan (MNEAP) (phase 2)</td>
<td>N/A</td>
<td>2019 -</td>
<td>Annual</td>
<td>Malta National Electro-Mobility Platform; Transport Malta; Ministry for Transport, Infrastructure and Capital Projects</td>
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<td>8.7</td>
<td>Study the introduction of Low Emission Zones</td>
<td>Transport Master Plan 2025</td>
<td>2020</td>
<td>Annual</td>
<td>Transport Malta; Malta National Electro-Mobility Platform; Ministry for Transport, Infrastructure and Capital Projects; Environment &amp; Resources Authority;</td>
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<td><strong>8.8</strong></td>
<td>Develop a national bicycle strategy</td>
<td>Transport Master Plan 2025; Draft National Cycling Strategy and Action Plan for the Maltese Islands</td>
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<td>Annual</td>
<td>Malta National Electro-Mobility Platform; Transport Malta; Ministry for Transport, Infrastructure and Capital Projects</td>
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<td><strong>8.9</strong></td>
<td>Sustainable Urban Mobility Plan (SUMP) for Valletta</td>
<td>Transport Master Plan 2025</td>
<td>2016 - 2020</td>
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<td>Malta National Electro-Mobility Platform; Transport Malta; Ministry for Transport, Infrastructure and Capital Projects</td>
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<td><strong>8.11</strong></td>
<td>Smart parking system for Valletta</td>
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<td>8.12</td>
<td>Pilot cycling corridors</td>
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<td>8.13</td>
<td>Develop a shore supply action plan for the TEN-T ports</td>
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<td>8.16</td>
<td>Public Transport Quality Corridors (PTQC)</td>
<td>Transport Master Plan 2025</td>
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<td>Transport Malta; Ministry for Transport, Infrastructure and Capital Projects</td>
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<td>8.17a</td>
<td>Increase the use of Intelligent Transport Systems in traffic management (phase 1)</td>
<td>Transport Master Plan 2025</td>
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<td>Transport Malta; Ministry for Transport, Infrastructure and Capital Projects</td>
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<tr>
<td>8.18a</td>
<td>Improvement of Ferry Landing Places (phase 1)</td>
<td>Transport Master Plan 2025</td>
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<td>Annual</td>
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<td>8.18b</td>
<td>Improvement of Ferry Landing Places (phase 2)</td>
<td>Transport Master Plan 2025</td>
<td></td>
<td>Annual</td>
<td>Malta National Electro-Mobility Platform; Transport Malta; Ministry for Transport, Infrastructure and Capital Projects</td>
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<td>8.19</td>
<td>Fast ferry link between Malta and Gozo</td>
<td>Transport Master Plan 2025</td>
<td>2020 – 2025</td>
<td>Annual</td>
<td>Transport Malta; Ministry for Transport, Infrastructure and Capital Projects</td>
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<tr>
<td>8.20</td>
<td>Initiatives related to electrification of the fleet</td>
<td>N/A</td>
<td>2019 - 2020</td>
<td>Annual</td>
<td>E-Cars Committee</td>
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<tr>
<td>8.20.1</td>
<td>Electric Vehicles (taxis and Government fleet)</td>
<td></td>
<td></td>
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<tr>
<td>8.21</td>
<td>Increase in financial grants for more efficient internal combustion engines (ICE)</td>
<td></td>
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<tr>
<td>8.22</td>
<td>Reform of Public Service Garage</td>
<td></td>
<td></td>
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<tr>
<td>8.23</td>
<td>Environmental Authorisations Regulations</td>
<td>Environment Protection Act (2016)</td>
<td>2020 – 2030</td>
<td>Annual</td>
<td>Environment and Resources Authority; Ministry for the Environment, Sustainable Development and Climate Change</td>
</tr>
<tr>
<td>8.24</td>
<td>A more sustainable construction industry</td>
<td></td>
<td></td>
<td></td>
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<td>8.26</td>
<td>Amendment to S.L. 549.66 for the utilisation of spent mushroom substrate</td>
<td>National Agricultural</td>
<td>2018 – 2027</td>
<td>Annual</td>
<td>Agricultural Directorate (MESDC)</td>
</tr>
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<td>8.27</td>
<td>Develop a Soil Action Plan</td>
<td>National Agricultural Policy (2018 – 2028)</td>
<td>2020 – 2022</td>
<td>Annual</td>
<td>SDECC Environmental Directorate (MESDC); Rural Development Directorate (RPD); Veterinary Phytosanitary Regulation Department (VPRD); Environment and Resources Authority (ERA); Governance of Agricultural Bio-Resources (MESDC)</td>
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<tr>
<td>8.28</td>
<td>Projects in primary water network</td>
<td></td>
<td>2021 – 2030</td>
<td>Annual</td>
<td>Water Services Corporation</td>
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<tr>
<td>8.29</td>
<td>Biofuels Substitution Obligation</td>
<td></td>
<td>2021 – 2030</td>
<td>Annual</td>
<td>Energy and Water Agency Regulator for Water and Energy Services</td>
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<tr>
<td>8.31</td>
<td>Waste to Energy facility</td>
<td></td>
<td>2023 – 2050</td>
<td>Annual</td>
<td>Ministry for the Environment, Sustainable Development and Climate Change</td>
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<tr>
<td>8.32.1</td>
<td>Financial support schemes for Solar PVs</td>
<td></td>
<td>2021 – 2030</td>
<td>Annual</td>
<td>Regulator for Energy and Water Services (REWS);</td>
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<tr>
<td>8.32.2</td>
<td>Engagement of stakeholders for increased deployment of Renewable Energy Sources</td>
<td>2021 – 2030</td>
<td>Annual</td>
<td>Energy and Water Agency</td>
<td></td>
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<tr>
<td>8.32.3</td>
<td>Solar Water Heaters Scheme</td>
<td>2021 – 2030</td>
<td>Annual</td>
<td>Regulator for Energy and Water Services (REWS);</td>
<td></td>
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<td>8.32.4</td>
<td>Energy Efficiency: electricity tariffs</td>
<td>2021 – 2030</td>
<td>Annual</td>
<td>Enemalta Corporation; Regulator for Energy and Water Services (REWS)</td>
<td></td>
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<td>8.32.5</td>
<td>Support scheme for Services and Industry</td>
<td>2022 – 2030</td>
<td>Annual</td>
<td>Energy and Water Agency; Ministry of Tourism; Malta Enterprise</td>
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<tr>
<td>8.32.6</td>
<td>Energy Efficient Street Lighting</td>
<td>2018 – 2022</td>
<td>Annual</td>
<td>Ministry for Energy and Water Management</td>
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</table>
## Annex 3: Public Consultation Submissions and Responses

<table>
<thead>
<tr>
<th>Ref No.</th>
<th>Name of Stakeholder / Date</th>
<th>Comments Received</th>
<th>Response / Remarks</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Etienne Scicluna 22/03/2019</td>
<td>My family resides near Bulebel Industrial Estate. It is a very well known fact that no studies has ever been conducted about the type of air quality and the type of pollution the factories in the Bulebel area are releasing. Very often, especially during the night, we have to close our windows because we could not resist the pungent odours coming from the factories, let alone those harmful chemicals which are being released in the air that are odourless. In fact, this situation is affected my children who both of them suffer from allergies through the year. The least that could be done is to dispatch some experts to conduct random checks near the Bulebel Industrial Estate in order to identify the source.</td>
<td>The aim of the NAPCP is to include measures to reduce emissions at a national level. Whilst the comment is noted, the nature of the comment is more oriented towards local air quality and nuisance. Complainant was advised to report immediately upon noticing such incidents.</td>
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<td>2</td>
<td>Mark Cassar 24/03/2019</td>
<td>Putting it bluntly, if enforcement is carried out as it should be wrt the VRT and on-the-road visual inspections the number of vehicles emitting noxious fumes would be drastically reduced but also the following mitigating measures would decrease the amount of air-pollutants:</td>
<td>Comment is noted. While agreeing with the fact that the VRT/on the road inspections should ensure that the more polluting vehicles are tackled, it should be noted that the NAPCP’s approach is more at a macro-level in that it looks at issues such as total fuel burn by the road transportation sector, vehicle kilometres driven, age of the vehicle fleet etc. Therefore, such a measure would have no impact on the total national emissions from road transport, because it mostly concerns the state of individual vehicles, which is not possible to include in the currently available models. This however does not</td>
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De-registration of vehicles older than 20-25 years should be considered - being the worst offenders of noxious fumes. Car engines' efficiency is reduced and inversely, pollution increases exponentially even after 5 years of use.

This comment is noted and will be considered for further studies.

Planting of more trees to reduce CO$_2$ levels and removal of other air pollutants and increase in the number of green-areas to mitigate air-pollution.

Comment noted. CO$_2$ emissions are targeted by the National Energy and Climate Plan, a draft of which has been completed by the Energy and Water Agency (EWA). The NAPCP deals with air pollutants (SO$_2$, NOx, nmVOC, NH$_3$ and PM$_{2.5}$).

More incentives/subsidies for the importation of electric and hybrid vehicles should be considered before the 2030-2040 deadline which has already been set anyway by many car manufacturers and EU countries. Electricity from the power-station moves the pollution from the road (albeit to the environs of the power-station); though the efficiency is higher than the individual internal combustion engines of hundreds of thousands of vehicles on the road) and the power-station emissions are also more strictly controlled.

Comment noted. It is always better to shift emissions to a stationary source such as a power plant because, in the case of the power plant the waste gases are emitted at a certain height above ground level. In addition the abatement technology for stationary sources has already delivered significant reductions with respect to emissions.

On the other hand cars emit air pollution in a diffusive manner and at ground level. In addition, abatement of emissions from cars is known to be less effective than those of stationary sources, particularly when the engine is still cold. Therefore the suggestion to financially support the
*Also HGVs (by far the worst offenders in terms of volume of air pollution and the fact that hundreds of such vehicles are ubiquitous and constantly on the road - unlike passenger vehicles which are utilised on the whole twice per day and for specific errands - need to be specifically included in the plan and subsequent enforcement thereon otherwise the programme would be a non-starter and the goal (reducing the rate of mortality/morbidity and to have cleaner air) would be far from being achieved.*

*Infringement of the EU Directive (EU) 2016/2284 on the reduction of national emissions of certain atmospheric pollutants (National Emission Ceilings (NEC) Directive) and the Ambient Air Quality Directive (2008/50/EC) may be financially wasteful and politically damming but the premature deaths of hundreds of people (the scientific estimate is between 473 and 677 - Thomas Münzel, University Medical Centre Mainz, in Germany published in the European Heart Journal) dying every year in Malta from air pollution should be more than enough an incentive to implement air pollution reduction policies and get things done right.*

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<tr>
<th>3</th>
<th>Jon Camilleri</th>
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<td><strong>26/03/2019</strong></td>
<td>I read your online consultations, as usual I like researching and I think that the way forward is establishing incentives for manufacturing to produce using renewable energies and using better materials.</td>
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<td>4</td>
<td>Mark Cassar</td>
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<tr>
<td>5</td>
<td>Gertrude Buttigieg OBO Malta Health Network</td>
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</table>
| | The programme should consider measures applicable to road transport as a priority since such a measure will beneficially affect all areas especially residential. Shipping (cruise liners, containers ships, other commercial shipping, etc) in Malta’s ports should also be considered as a priority due to the large population residing around the harbour areas (including Marsaxlokk and B'Bugia areas). Domestic heating (note the possible increase in household fireplaces) and small industries such as bakeries, automotive spray paint painters, etc and construction processes often present within residential areas should be included in further measures to adopt in order to comply with the emission reduction commitments and improve health and wellbeing of population. | As regard road transport, the NAPCP prioritises measures in this sector.

Regarding emissions from cruise ships, it is to be noted that the NEC Directive is limited to national navigation and this does not included cruise liner visits. However, studies apart from the NAPCP may be considered.

Regarding the smaller industry, the NAPCP also addresses this sector by proposing a new set of Regulations targeting the smaller emitters, which are currently not regulated by EU legislation. |
<p>| | Objectives should include effective implementation and monitoring (not just emission levels but also environmental permitting or other conditions set for their operation). Penalties applicable to infringements of provisions laid down in the proposed programme should be immediate, effective and dissuasive. | This comment is noted. |
| | The national air pollution control programmes should be updated at least every four years as per Article 6(3) of (EU) 2016/2284 with appropriate stakeholder involvement and consultation including the competent authorities (especially Health Ministry), local councils, public and NGOs. | The NAPCP will be updated every 4 years in line with the requirements of Article 6(3) of Directive 2016/2284 in consultation with all relevant stakeholders and the general public. |</p>
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<tr>
<td>Article 14 (Access to information) of (EU) 2016/2284 must be adequately reflected in proposed programme, namely ensuring the active and systematic dissemination to the public of the stated information by publishing it on a publicly accessible website.</td>
<td>The objectives of the plan were issued for public consultation whilst the draft of the plan is also being published for a 6 week consultation period.</td>
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<tr>
<td>Last but not least the Malta Health Network has been on the forefront in Malta promoting the European Charter of Patients’ Rights – first right is the Right to Preventative measures. Having better Air Pollution control is in line with the rights which we believe could help to prevent many illnesses and alleviate the quality of life of patients who have health conditions especially respiratory problems.</td>
<td>This comment is noted.</td>
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<td>In brief I would like the NAPCP to focus and prescribe effective remedies in relation to pollution from construction sites which are a significant source of PM2.5, PM10 and NOx. The emissions from construction sites is to be given additional attention in the context of Malta, in view of the intensity and extent of construction industry. Enforcement of the very scant legislation relating to dust control (mentioned in the Air Quality Plan) is severely lacking and the Building Regulations Office has been effectively been reduced to a toothless hound. Even when enforcement action is taken the penalties are too low to offer a real deterrent. Insufficient attention is being given to the height of buildings that are continuing to rise, thus creating polluted air traps. Furthermore, due attention is to be given to air pollution emitted by docked cruise liners. Malta is a popular port with multiple large cruise liners docking in the Grand Harbour for severely hours, nearly every day.</td>
<td>The NAPCP’s approach is more at a macro-level in that it looks at issues such as total fuel burn from the road transportation sector, vehicle kilometres driven, age of the vehicle fleet etc. The document does not look into local air quality issues. Please refer to previous comment in relation to same subject.</td>
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Dr. Christine Bellizzi
23/04/2019
Considering, the ever growing intensity of construction sites, the docking of cruise ships, intense traffic and congestions, industrial activities such as Palumbo are all concentrated in the Valletta - Sliema agglomeration due care should be given to the effects on human health and the public is to be given due warning of the hazards that these present.

| | | Please refer to previous comments on local air quality issues. |