

RECOGNIZING MALTA'S ENVIRONMENTAL CHALLENGES

NATIONAL STRATEGY FOR THE ENVIRONMENT FOR 2050



MY ENVIRONMENT, MY TURN



MINISTRY FOR THE ENVIRONMENT,
CLIMATE CHANGE AND PLANNING

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CHALLENGES**

JULY 2020

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1.0 Introduction and Scope

- 1.1 It is recognised that our environment: affects our well-being; is intrinsic to our quality of life; is a precious resource, especially in an island as small as ours; is subject to intense pressures; and underpins our economic development. This means that access to a healthy environment is both our duty and our right. However one must also recognise that it is also each and everyone's moral and legal obligation to contribute towards a sustainable future.
- 1.2 This cannot be achieved without clear and well thought out plans for the future. The NSE aims to provide an environmental policy framework for approximately the next 30 years, i.e. to 2050, aiming to set out what should be done to improve the environment within a generation. This long-term approach aims to look at what is necessary beyond the usual 5 to 10-year cycles and forward thinks where the environment should be at in 2050. Although long-term goals will be set for 2050, details and plans of actions that need to be undertaken will be in 10-year phases (i.e. 2020, 2030, 2040) with intermittent reviews to update the Strategy as necessary.
- 1.3 Articles 45-47 of the Environment Protection Act (Cap. 549) establish the requirement for a National Strategy for the Environment (NSE), commenced by virtue of Legal Notice 37 of 2019. The NSE is a strategic governance document that sets the policy framework for the preparation of plans, policies and programs issued under the Act or under any other Act for the protection and sustainable management of the environment.
- 1.4 The main objectives of the NSE are to:
 - address the main environmental challenges Malta is facing;
 - ensure a better and sustainable quality of life;
 - provide clear and long-term direction for our environment;
 - set out national environmental targets; and
 - integrate and synergise efforts of all policies and stakeholders who directly or indirectly influence the state of our environment.

It will also give due recognition to national and international policy that governs environmental issues. However, it is to be noted that providing details of relative international policy framework is beyond the scope of this paper.

- 1.5 ERA published the intent of developing an NSE Vision for 2050. The consultation was held between 26 April 2019 – 19 May 2019, and established that the key objectives of the 2050 Vision are to:
 - envision our environment in the long-term
 - set the context and become the guiding principle for developing the Strategy itself
 - outline the strategic aspirations for the environment.

- 1.6 The following points were raised during the Vision Intent consultation:

Do you agree with the proposed overarching objectives of the Strategy?

Respondents expressed their agreement with the proposed objectives and gave their opinions on what measures can be taken for their fulfilment. Examples of the latter include prioritising environmental considerations in major decisions, ensuring the conservation of Malta's natural capital (including that related to urban and rural areas), increasing enforcement of environmental legislation and increasing citizen's connection to and ownership of the natural

environment. Furthermore, the need for more integrated governance across all sectors which influence the environment and joint ownership of such national policies was highlighted.

Can the objectives be further refined, keeping in mind the long-term goal of this Strategy till 2050?

The need for specific, focused and action-oriented objectives was highlighted. Furthermore, the need for an agreed definition of what constitutes a good and sustainable quality of life was also suggested, in order to objectively measure the success of the strategy.

What aspects do you retain to be crucial to consider in the vision for 2050?

Respondents put forward an array of recommendations for crucial strategic aspects to give consideration in the vision for 2050. Amongst others, suggestions were received to establish Malta's environmental limits, beyond which the environment is affected negatively, as well as to revise current policies which are having undesired impacts on the environment.

What parallel developments would you expect to see to enable a sustainable quality of life?

Stakeholders proposed different aspects which, if carried out in parallel to the NSE, would contribute to the improvement of Malta's environment. These include the improvement of institutional capacity, increasing understanding of environmental capital, ongoing targeted education and improving integration of sectoral policies.

What are in your opinion Malta's main environmental challenges in the next 30 years?

Stakeholders responded with various suggestions for the main challenges facing Malta's environment. Common challenges mentioned include:

- improving air quality;
- improving the quality of urban areas, by curbing excessive construction and use of private vehicles;
- protecting biodiversity;
- improving waste management practices by all waste producers;
- safeguarding water resources.

The Vision Intent Consultation submissions and responses are available on ERA's website.

- 1.7 Building on the broad aims developed through the NSE vision intent consultation, this paper seeks to increase the resolution of the identified overarching goals, by defining environmental challenges that are to be addressed in the upcoming NSE, forming the basis for long-term strategic goals. Section 2 provides an overview of the documents used to define the issues listed in this paper. This stage facilitated the development of policy scenario options that are likely to govern environmental policy up until 2050. These policy scenario options were then assessed, and a preferred scenario selected. The selected preferred scenario provides the framework for and NSE Vision and the development of the NSE Strategy for 2050. Setting the Strategy in the right framework is essential as from its early stages.

Figure 1: NSE Development Steps



2.0 BACKGROUND

- 2.1 This paper lists environmental challenges emanating from the:
- ERA's Malta's State of the Environment Report (SoER), 2018;
 - ERA's Environmental attitudes and behaviour in Malta: Results and analysis from a nation-wide survey, 2017;
 - Ombudsman Commissioner for Environment and Planning Opinion on the State of the Environment Report, 2018;
 - EU Environment Implementation Review Report for Malta, 2017; and
 - EU Environment Implementation Review Report for Malta, 2019.

These documents are very briefly described below, providing an overview of the working framework of this consultation paper. A detailed account of the arising issues is subsequently presented in section 4.

Malta's State of the Environment Report, 2018

- 2.2 The Environment Protection Act obliges the competent authority, ERA, to publish a state of the environment report every four years. Regular state of the environment reports have been published as part of a commitment towards providing environmental information in a form that is easily accessible and user-friendly. These reports aim to assist policymakers, opinion leaders, and members of the public to keep abreast of environmental trends, while having access to more long-term, detailed information and analysis in the state of the environment reports.
- 2.3 Malta's 2018 SoER follows on the footsteps of the four previously published reports, discussing the state of Malta's environment over 7 years (2009-2015). The report consists of nine chapters that deal with horizontal issues such as the drivers of environmental change, the policy that was in effect during the period under review, and other broad aspects such as environmental health and climate change. The report also focuses on the state of our biodiversity, marine and fresh waters, ambient air, waste, and land and coast.
- 2.4 The 2018 SoER indicates: good coastal, inland surface, bathing, and drinking water quality; decreases in sulphur dioxide; increased biodiversity conservation and the adoption of the first national comprehensive biodiversity policy; improved countryside management with the establishment of Natura 2000 site management plans; increased waste management infrastructure, initiatives and the establishment of a new Waste Management Plan covering period 2014-2020; a greening economy; and the strengthening of environmental permitting.
- 2.5 The 2018 SoER also identifies the following emerging issues and areas requiring continued efforts and attention: pressures arising from the diverse demands of an increasing population for environmental and infrastructural services; a prevailing reliance on private car use; socio-economic disparities with regards to noise and air pollution exposure; the need for continued efforts to curb nitrate levels in groundwater, and mercury levels in marine waters, whilst also maintaining sustainable groundwater abstraction; efficient land-use management; increase the understanding of marine litter and micro-plastics; the adoption of more sustainable fishing practices; improved soil conservation efforts to reduce the rate of soil erosion; improving public environmental stewardship; reduce waste generation per capita, and increased resource efficiency.

Ombudsman Commissioner for Environment and Planning Opinion on the State of the Environment Report, 2018

- 2.6 Article 57(3) of the Environment Protection Act, stipulates that the Commissioner for Environment and Planning within the Office of the Ombudsman delivers his opinion on the SoER to the Speaker of the House. Such report is the first of its kind, and is in line with the Ombudsman function as an autonomous representative with the mandate to safeguard the rights of individuals, to promote fairness, justice and equity in administrative action, and to improve relationships between instruments of government at all levels, and the people.
- 2.7 The Ombudsman Opinion stresses on the:
- i. need to adopt a micro-planning approach that address the increasing reality of overcrowding, adopting solutions to transport, dwelling provision, and other supporting infrastructure that does not exert more pressure on Malta's undeveloped land, whilst ensuring the protection of the rural area, and improved efficient management of other land uses that cannot be located within urban areas;
 - ii. importance of providing environmental information when it is needed, supported by further information on the quality of the data used and the supporting monitoring systems;
 - iii. importance of developing green infrastructure, and better translating the benefits of protecting biodiversity;
 - iv. importance of enhancing rainwater harvesting, and understanding demands;
 - v. need to find solutions to a waste reality that is intrinsic to people's behaviour;
 - vi. need to develop "an environmental plan that is dynamic and agile in view of the emerging risks"; and
 - vii. importance of planning long-term, and give weighting to the costs of cumulative environmental problems to future generations, whereby it is understood that protecting the environment makes good economic sense.

Environmental attitudes and behaviour in Malta: Results and analysis from a nation-wide survey, 2017

- 2.8 ERA commissioned a survey among a representative sample of citizens to provide a snapshot of households' perceptions and behaviour regarding the natural environment and biodiversity in Malta, with a view to informing environmental policy and providing a baseline against which to assess similar future studies. This study was conducted by the Department of Economics at the University of Malta (UM) as part of a collaborative agreement with ERA.
- 2.9 The study revealed:
- i. Pro-environmental attitudes and behaviours with increasing number of people considering the environment to be of high importance comparable to concerns on the economy; voicing concern for the degree of land development, traffic, and air pollution. Freshwater pollution, waste management, depletion of natural resources and soil degradation or erosion indicate low level of concern.
 - ii. Public environmental contributions focus on waste separation, use of energy saving light bulbs, investing in PV and solar water heaters, giving donations for environmental causes, planting a tree, and to a lesser extent volunteering with an environmental NGO, listed in order of popularity.
 - iii. Public awareness on the importance of protecting biodiversity, but a limited tangible understanding of what it means, and how they can contribute to biodiversity protection
 - iv. A limited understanding of Malta's environmental governance structures and claim that these structures should do more for the environment.

EU Environment Implementation Review Report for Malta, 2017

- 2.10 The Commission launched the Environmental Implementation Review (EIR) in May 2016, a two-year cycle of analysis, dialogue and collaboration to improve the implementation of existing EU environmental policy and legislation.¹ The reports written by the Directorate-General for Environment, European Commission, rely on the detailed sectoral implementation reports collected or issued by the Commission under specific environmental legislation as well as the State of the Environment Report and other reports by the European Environment Agency.
- 2.11 The report established the following priorities for Malta:
- i. Speeding up the implementation of the EU waste management requirements, as landfill rates are extremely high and recycling rates very low, as well as improving the water management to ensure protection of water bodies.
 - ii. Improving air quality in the most urbanised areas by introducing systemic solutions for transport congestion.
 - iii. Improving the protection of habitats and species of EU interest by fully implementing the Natura 2000 instruments and strengthening the enforcement of the Birds Directive.
 - iv. Supporting Small and Medium Enterprises (SMEs) to move towards a more circular economy.
 - v. Improving compliance assurance by stepping up inspections and enforcement action.
 - vi. Investing in making the tourism sector more sustainable, which is a double win: less environmental pressure and a more attractive tourist destination.

EU Environment Implementation Review Report for Malta, 2019

- 2.12 The report established the following priorities for Malta:
- i. Strengthening environmental enforcement overall remains a key issue to be dealt with.
 - ii. Significant improvements are needed to put waste management in line with the waste hierarchy. The recycling rate is too low, far below the EU average and the landfilling rate remains too high, more than three times the EU average.
 - iii. Reducing emissions is particularly pressing in road transport, considering the increasing amount of cars and the aged car fleet. The report recognises some progress in addressing air quality and traffic congestion, nevertheless additional efforts are still needed to define strategic targets and actions beyond 2020.
 - iv. Protection of habitats and species of EU interest by strengthening the enforcement of nature directives is work in progress. The establishment of conservation objectives and measures require further efforts. Progress has also been made to align hunting and trapping practices to the requirements of the Birds Directive.

3.0 DEFINITIONS AND SELECTING ISSUES

- 3.1 This paper adopts an all-encompassing definition of the term 'environment' that attempts to adopt a systems philosophy, which tries to establish the casual interaction between the

¹ Communication "Delivering the benefits of EU environmental policies through a regular Environmental Implementation Review" (COM/2016/ 316 final).

different components of the urban, natural and human environments, also recognising the components and their role as a stock, sink, and flow. This approach hence seeks to consider the different components together as units. In this regard, the definition of the environment in Cap. 549 Environment Protection Act:

"environment" means the whole of the elements and conditions, natural or man-made, whether together or in isolation, and in particular: (a) the air, water, land, soil and sea, including their bedrock, aquifers and subsurface features; (b) all the layers of the atmosphere; (c) all biodiversity; and (d) the landscape and its features;

is being discussed with an underlying understanding that:

- i. the health of one of more components of the environment affects the other components of the environment, directly or indirectly, and
- ii. the integrity and capacity of the transport, housing, utility (water and energy), recreational, air, and waste systems that support our living environment is dependent on the integrity of the above-mentioned components.

3.2 Environmental issues have hence been included in this paper following the analysis of the above mentioned documents (ERA's State of the Environment Report (SoER), Malta, 2018; ERA's Environmental attitudes and behaviour in Malta: Results and analysis from a nation-wide survey, 2017; Ombudsman Commissioner for Environment and Planning Opinion on the State of the Environment Report, 2018; EU Environment Implementation Review Report for Malta, 2017; and EU Environment Implementation Review Report for Malta, 2019), whereby it is understood that the status of the environmental components listed in the above definition, directly or indirectly affects the following components of Quality of Life as defined by Eurostat:

- i. Material living conditions (income, consumption and material conditions (deprivation and housing)).
- ii. Productive or main activity (quantity of employment, quality of employment and other main activity (inactive population and unpaid work)).
- iii. Health (health outcome indicators such as life expectancy, the number of healthy life years and subjective assessments of own health, chronic diseases and limitations in; health determinants (healthy and unhealthy behaviours, such as smoking, alcohol and fruit and vegetables consumption and exercising; and access to healthcare).
- iv. Education (population's educational attainment; self-assessed and assessed skills; participation in life-long learning and opportunities for education).
- v. Leisure and social interactions (Leisure activities: both in terms of quantity (how often citizens spend time with people at sporting or cultural events) and quality (their satisfaction with time use), as well as (lack of) access to this type of activity due to lack of resources or facilities; and in terms of social interactions, and activities with others (frequency of social contacts and satisfaction with personal relationships) and for others (volunteering in informal contexts), the potential to receive social support (help from others) and social cohesion (trust in others)).
- vi. Economic and physical safety (physical safety (e.g. the number of homicides per country from police records and the proportion of those who perceive there is crime, violence or vandalism in the area in which they live; and economic safety, considering wealth (the value of assets owned minus the value of liabilities owed at a point in time by a household)).

- vii. Governance and basic rights (trust in institutions and public services; discrimination and equal opportunities and active citizenship)
 - viii. Natural and living environment (exposure to air, water and noise pollution can have a direct impact on the health of individuals and the economic prosperity of societies. Environment-related indicators are very important for assessing quality of life in Europe and in general. Subjective indicators, such as individuals' own perceptions of noise levels or the existence of pollution and grime in their local area and their satisfaction with the environment and the green areas in their local area.
 - ix. Overall experience of life (life satisfaction (cognitive appreciation), affect (a person's feelings or emotional states, both positive and negative, typically measured with reference to a particular point in time) and eudaemonics (a sense of having meaning and purpose in one's life, or good psychological functioning).
- 3.3 This exercise is also being construed in recognition of the 17 Sustainable Development Goals aiming to: end poverty; achieve food security; ensure healthy lives and well-being; ensure equitable quality education and lifelong learning opportunities; achieve gender equality; ensure the sustainable management and availability of water and sanitation; ensure access to affordable, reliable, sustainable and modern energy for all; promote sustainable economic growth and productive employment; build resilient infrastructure that promotes inclusive and sustainable industrialisation fostering innovation; reduce inequality within and among countries; make cities and human settlements inclusive, safe, resilient and sustainable; ensure sustainable consumption and production patterns; combat climate change and its impacts; conserve and sustainably use the oceans, seas and marine resources; protect, restore and promote sustainable use of terrestrial ecosystems and halt land degradation and biodiversity loss; promote peaceful and inclusive societies for sustainable development; and strengthen the means of their implementation.

4.0 MALTA'S ENVIRONMENTAL CHALLENGES

Safeguarding Environmental Quality: Air

- 4.1 National monitoring shows that air quality in Malta largely meets EU standards, continued efforts are nevertheless required to address identified hotspots. Malta's most significant air pollutants include: ground level ozone (O₃) (most of which are probably originating from overseas sources), nitrogen oxides and particulate matter (mainly from transport). Monitoring results also show significant decrease in sulphur dioxide (SO₂) concentrations attributed to the phasing out of heavy sulphur fuels. Natural dust sources from sea spray as well as Saharan dust contribute a relatively large fraction of the dusts in our air, which when deducted, significantly reduces the number of incidences of limit value exceedances.
- 4.2 There are efforts to reduce air pollution, along with the future implementation of cleaner transport and an energy mix comprising of power stations burning liquefied natural gas, importing electricity through the Malta-Sicily interconnector cable and wider use of photovoltaic (solar panel) technology. A slight positive shift in Malta's car fleet towards fuel-efficient vehicles is also noted. However, private car use remains high, while consumption of alternative fuels is still low, making this one of the key forces for environmental concern.

- 4.3 The improved timely reporting of validated air quality data facilitates improved action to protect human health from air pollution.
- 4.4 There is an opportunity to reduce the occurrence of respiratory diseases with improved air quality, noting that some indoor air pollutants originate from outdoors. EEA (2019) reports that in 2016, 210 premature deaths were attributed to exposure to PM_{2.5} and 20 premature deaths from exposure to ozone. Furthermore, 83.6% of the public are highly concerned about Malta's air quality, and 72.7% of the public are highly concerned about their locality's air quality.

Challenges

4.5 *High levels of ground-level ozone, especially in rural areas*

Ozone (O₃) is a secondary pollutant formed through chemical reactions of primary traffic and power generation emissions. Ozone is principally of transboundary origin arriving in Malta from Europe. It may give rise to breathing problems, eyes, nose, and throat irritations, or cardiovascular diseases.

4.6 *High levels of PM₁₀*

Traffic congestion and to a minor extent power generation are the main sources of particulate pollution although a relatively large fraction of PM₁₀ can be apportioned to salt from sea spray as well as Saharan dust. It may impact the central nervous system, the reproductive system, give rise to breathing problems, cardiovascular diseases, or pulmonary diseases.

4.7 *High levels of nitrogen dioxide in traffic-prone areas*

Nitrogen Dioxide (NO₂) concentrations have remained largely within the annual limits but have occasionally exceeded the hourly limit in the Msida traffic site. The concentration of NO₂ is higher in traffic congested areas and may pose a significant problem in dense urban areas. This pollutant may cause breathing problems, eyes, nose, and throat irritations, or impact the liver, spleen, and blood.

Safeguarding Environmental Quality: Environment and Health

- 4.8 There is an increasing awareness of how human health and wellbeing depend on access to a clean environment, albeit the complexity to clearly establish the interactions between environment and human health. The popular environment health concerns are ambient air quality, water quality, and sanitation; and an increasing awareness on environmental noise, and exposure to hazardous chemicals. Nevertheless, the value of access to open space and how this influences physical and mental health; and the threats relating land degradation, biodiversity loss, and changes in climate are increasingly being recognised in quality of life assessments.

Challenges

4.9 *Limited access to open space or safe environments conducive to physical activity and mental health*

A safe environment that encourages personal mobility and physical exercise is important for health, including mental health, and prevents obesity. The Health Behaviour in School-aged Children survey for 2005/2006 shows that children aged between 11 and 15 years in Malta are well below the average of countries when it comes to performing physical activity at the recommended level (11 years: girls 18 %, boys 27 %; 13 years: girls 14 %, boys 20 %; 15 years: girls 13 %, boys 19 %). This leads to Malta's population gaining the highest prevalence of

overweight and obesity in the European region. The creation of safer roads and safer playgrounds which are ideally located away from traffic-congested areas, and planning for greener corridors and areas in our localities may encourage more physical activity and the consideration of a modal shift from the private car to cycling and walking, while also having various psychological and emotional health benefits.

4.10 *Limited planning for Environmental Noise, and integrating solutions in land-use and transport planning*

Noise pollution is being considered an equity issue in relation to socioeconomic status (income and education), age and place of residence. This indicates that the poor, the old and those living in dense places in Malta are exposed to heavy traffic and are the most affected, making further action in this field highly significant.

The Environmental Noise Directive requires EU member states to assess exposure to noise from key transport and industrial sources with two initial reporting phases: 2007 and 2012. Malta has submitted noise mapping for reference year 2011, and a National Action Plan (2013) which include measures to address noise issues identified, aiming to prevent and reduce environmental noise where necessary and preserving environmental noise quality where this is known to be good. The plan also sets out medium and long-term objectives that seek to enhance the knowledge framework supporting improved environmental noise management in Malta. There is an opportunity to continue to pursue the efforts of the 1st National Noise Action Plan.

4.11 *Limited understanding, awareness, and management of chemical flows through our food and living systems*

The increasing use of chemicals through various sectors including industry, agriculture and transport, has increased our exposure to a large number of chemicals of both natural and man-made origin. The misuse and poor collection and treatment of chemicals and other hazardous substances, may pass into the environmental media of air, water, sediment and soil, resulting in chemical exposure in different environments and media: home, school, playgrounds, recreational and consumed water, and food. Chemicals may have immediate acute as well as long term chronic health effects depending on dosage and length of exposure and give rise to respiratory diseases and cancers.

Pesticides, mercury, and blood lead levels are of particular concern. Annual statistics produced by the Malta Competition and Consumer Affairs Authority (MCCAA) shows an increase in MRL (Maximum Residue Level) exceedance in the total number of local, EU and third country import samples analysed from 2014 to 2016. Mercury toxicity is of serious risk to humans, fish, ecosystems and wildlife, and may travel long distances through air and water, necessitating cooperation at an international level. Malta became signatory of the Minamata Convention on Mercury in 2014 and ratified the agreement in 2017. The Convention commits governments to implement measures to control human-made pollution from mercury and covers the entire lifecycle of man-made mercury pollution. With regard to lead, a 2001 study established that the average blood lead level in children was lower than 50 µg/l, and levels in the adult population have steadily decreased since the 1990s from as high as 274 mg/l in 1981 down to 72 mg/l and 59 mg/l in 2002 and 2005 respectively. The establishment of a poison-control centre would facilitate the continued analysis of existing databases used for the registration of imported chemicals and exotic animals in order to ensure that suitable antidotes are available at all times for effective treatments.

4.12 *Excessive coarse dust emissions*

Coarse dust mostly resulting from mineral extraction, mineral manufacturing, and construction, is larger in size than the particulate matter discussed in the previous section. Coarse dust is considered to be more of a nuisance rather than a health-related issue, nevertheless increase dust suppression measures are required to eradicate this nuisance that impinges on both Malta's urban and rural environment.

Addressing Climate Change

4.13 The climate change debate may seem complex and far-removed from our daily lives. Nevertheless this scientifically complex, all-encompassing, economic, political and social problem becomes real to us in extreme weather events. Decarbonisation of Malta's activities offers opportunity for improved environmental health. Furthermore, understanding Malta's susceptibility to world climate change trends is an opportunity for Malta to prepare and implement adaptation measures that increase Malta's economic and social resilience to future climate trends.

Challenges

4.14 *Levels of GHG emissions*

There is a major difference between the quantity of Greenhouse Gases (GHGs) emitted between 2007 and 2012, particularly with the switch to more efficient turbines for energy generation in years 2013-2014. GHG emissions between 2007 and 2014 showed a general trend presenting a net decrease of GHG equivalent to 136.47 kt of Carbon Dioxide equivalent (CO₂-eq). The energy sector is the principal contributor (amounting to 83.8 % of the total emissions reported in 2014) to Malta's GHG emissions. Malta had higher emissions than its annual targets in each of the years 2013-2017. To compensate for this, Malta utilised flexibilities provided by the Effort Sharing Decision. The Effort-sharing Decision requires Malta to limit such emissions to a level not greater than 5 % above 2005 emission levels, by 2020, including interim annual targets. Malta's contribution to EU climate mitigation action in the longer-term is even more stringent, with Malta's target for 2030 being a reduction of 19 % compared to 2005 levels.

There is a clear link between Malta's energy sector and the total national GHG emissions, and the share of transport related GHG emissions continue to increase with time.

Continued efforts to reduce carbon emissions are being pursued through the already established national renewable energy target of 10% by 2020 complemented by a 10 % target for the share of renewable energy sources in all transport in 2020; the implementation of the Climate Action Act (Cap. 543); and the upcoming national Low Carbon Development Strategy.

4.15 *Limited national preparedness and resilience to future climate change impacts*

Improved preparedness and resilience to future climate change impacts through the steady and continuous implementation adaptation-related actions towards climate change is required. These include maintaining (i) observations and assessment of climate impacts and vulnerability; (ii) planning for climate change, and (iii) the implementation, monitoring and evaluation of actions. There is an opportunity to commit to adaptation planning and actions within the framework of the Covenant of Mayors for Climate and Energy; to seek the establishment of a Climate Action Board; and to ensure the regular updates of the National Adaptation Strategy.

4.16 *Restricted synergies between climate change policy and other policies*

The significant reduction in GHG emissions experienced in electricity generation needs to be complemented by measures that address pressures arising from transport, the use of F-gases, agriculture, and waste, hence increasing the efforts to reduce national greenhouse gases across all sectors. The increase in policy coherence between climate policies and all other policy provides opportunity for investment in clean energy which is supported by planning policies that safeguard public solar rights, such as for example opening up apartment blocks to individual PV system solutions, and the promotion and incorporation of green infrastructure into plans and programmes.

Sustainable Use of Resources: Land and Coast

- 4.17 Malta's 2012 land cover map² indicates that a mix of pastures and agriculture makes up the Islands' predominant land cover, followed by urban development and natural and semi-natural areas. Decisions relating to land use in Malta are highly debated due to Malta's small size, high population density and natural diversity.
- 4.18 The present data for 2005-2011, indicate a proportional increase in both the actual dwelling stock and the vacant dwellings. The largest proportion of non-dwelling total approved floor space in Malta pertains to environmental leisure (30 %), followed by office (13 %), warehousing (13 %), and leisure development (10 %).
- 4.19 The most dominant contributors to the total floor-space approved in the predominantly urban coast are cultural (18.1 %), warehouse (17.7 %), and leisure projects (13.5 %). The Grand Harbour Local Plan area is the most affected, absorbing 40 % of the total approved floor space, followed by the North West, Marsaxlokk Bay, South Malta, and North Harbours Local Plan areas. Environmental leisure is the prevalent contributor to the total floor space approved in the predominantly rural coast, making up 91.5 % of the total approved floor space, and mostly affecting the North West Local Plan area, Marsaxlokk Bay, and Gozo and Comino.
- 4.20 The Environmental Attitudes and Behaviour survey reveals that more than three-fourths of respondents (76 per cent) were highly concerned about land use for buildings, and 91.4 per cent were highly concerned about urban problems like traffic and open space. Sixty-seven per cent of the respondents also disagreed to building permits granted in the countryside; and 80% feel that Malta is too built up.

Challenges

4.21 *Limited integration of land-use into coordinated decision making and policy development to maximise land-use efficiency*

In order to achieve environmental improvement and land use efficiency while fostering economic development and social progress, the integration of land use aspects into coordinated decision-making is encouraged. An integrated approach is required to involve all relevant levels of government supported by the adoption of targets on soil and on land as a resource, and land planning objectives. The Strategic Plan for Environment and development (SPED) should serve

² EEA. 2017b.

as the binding document for all Government entities alike and move towards the EU goal of no increase in net land take³.

4.22 *Lack of integration of the ecosystem approach into urban planning and development*

In recognising the urban system as a dynamic changing environment, planners are called to move from end-state plans to flexible plans. Adopting a systems approach will contribute to the improved articulation of the urban system's components, and the flows and processes supporting that system; hence seeking to appreciate the cogwheels that drive urban development. Such an approach encourage the establishment of policies for sustainable urban planning and design (including innovative approaches for urban public transport and mobility, sustainable buildings, energy efficiency and urban biodiversity conservation). Financing greener urban areas encourages the greater uptake of green infrastructure, promoting and supporting tree planting and the conservation of the existing tree cover, providing initiatives for the cultivation of rare and protected trees (in public areas), and reducing the environmental footprint of infrastructural developments in return. Such initiatives also seek to improve public transport efficiency and encourage the uptake of greener transport means, safeguard urban biodiversity in villages and towns, increase public and private investment in renewable energy production, and increase water management efficiency.

4.23 *Restricted understanding and management of vacant dwelling stock*

In 2011, the total dwelling stock in the Maltese Islands stood at 223,850, of which 41,232 (18.4 %) were permanently vacant (this excludes the 13.3 % seasonal or secondary use dwellings) this percentage has increased by 3.2 % from 2005. The total dwelling stock in 2005 stood at 192,314 with 53,136 being vacant (whereby this figure includes seasonal or secondary use dwellings). These figures indicate a proportional increase in both the actual dwelling stock and the vacant dwellings over the period 2005-2011. To date, there exists no comprehensive information which takes stock of the quality of vacant dwellings and which quantifiably describes the issues that hinder them from being readily available on the market apart from the general trend towards price stickiness in a downward direction. However, the statistics concerning the number of vacant dwellings leads to the conclusion that there is an oversupply of land for housing.

A more detailed assessment of residential supply vis-à-vis demographics and the vacant dwellings issue is warranted. The comprehensive assessment is required to take stock of the quantity and quality of vacant dwellings. Such information will help develop adequate long-term planning and protection of existing streetscapes, in order to provide adequate forms of dwellings for a range of inhabitants, whilst formulating incentives that promote sustainable urban regeneration; hence reducing the number of vacant dwellings, building dilapidation and urban decay.

4.24 *Need to rationalise development in the countryside*

Land development and the inappropriate design of rural buildings have serious impacts on countryside quality. Unbuilt and agricultural land should be protected from development, whereby only developments which specifically require a countryside location are required to be permitted outside the development zone (ODZ). The utilization of public property or outside development areas should not be considered as a solution to unaffordable housing. Any interventions with regards to affordable housing should be economical through tax regimes and incentives rather than physical in nature, and is required to give regard to the cultural value of Malta's urban fabric.

³ The European Commission's Roadmap to a Resource Efficient Europe (COM (2011) 571) and Spatial Plan for the Environment and Development 2015.

4.25 *Need to value and manage the costs of land degradation and soil erosion*

Malta's increasing urbanisation, together with the intensification of agricultural practices, have accentuated the pressures on soil. Malta's soil resources are important for the maintenance of ecosystem health, as well as for agriculture and water management. The annual soil loss indicates that 19.3 % of Malta is at risk of moderate to severe soil erosion. The yearly cost incurred by the average agricultural farmer to replace eroded soils and artificially maintain soil quality in erosion affected areas amounts to over 65 % of the average yearly economic revenue from Maltese Utilised Agricultural Area (UAA).

The preparation of a national action plan proposing measures for improved soil management is required, defining measures to combat soil degradation (including the decline of organic matter), to reduce the level of input of chemical fertiliser, and to ensure the sustainable use of soils, the preservation of its functions, and the restoration of degraded soils, hence combating desertification threats. Such measures need to be supported by the ongoing assessment of natural, anthropogenic and socio-economic factors that threaten soil resources. Such assessment is required to include the monitoring, measurement and assessment of the costs incurred to replenish lost soil.

4.26 *Need to strengthen environmental stewardship in agriculture*

The Maltese countryside - 70 per cent of all land area, faces various threats pertaining to the agricultural makeup; such as land abandonment, loss of rubble walls, dumping, land reclamation for agricultural use, and the degree of countryside access. A myriad of measure may be adopted to strengthen environmental stewardship in Agriculture, these include the establishment of management contracts for agricultural land to support biodiversity, and improve water and soil management; update national legislation to alleviate the adverse effects socioeconomic parameters on agricultural practices; measures to encourage the protection and of rehabilitation rubble walls in terraced fields; incorporate other cost-effective agricultural management methods to reduce soil erosion, maintain soil quality and preserve agriculture associated ecosystem services; support of projects for carbon conservation and sequestration in agriculture; adopt more efficient irrigation methods in irrigated land; continue to enforce measures to govern the period during which fertilisers are applied and reduce the quantity of fertilisers used in the agricultural sector; reduce greenhouse gas and ammonia emissions from livestock farms; and improve the overall quality of rural areas.

4.27 *Need to renew afforestation efforts*

In Malta, tree cover is low and woodland cover is less than 5 % of the area of the Maltese Islands. Approximately sixty tree species are considered indigenous and these included the Aleppo Pine (*iż-żnuber*), the Carob (*il-ħarruba*) and the Olive (*iż-żebbuġa*) as well as the rare and endangered Mock Privet (*l-olivastru*), the Common Sumach (*xumakk tal-konz*), the Willows (*is-safsaf il-kbira* or *is-safsafa ż-żgħira*) and the Christ's Thorn Tree (*ix-xewk tal-kuruna*). Sixty-six per cent of the approximately 60 native tree species are rare or endangered. Thus it is important to promote and support tree planting and the conservation of the existing tree cover. Renewed afforestation efforts should be initiated with community involvement to encourage ownership.

4.28 *Need for integrated coastal zone management that continues to curb pressures of economic activities on the natural environment*

The coast is subject to ongoing land use pressures that cause irreversible damage or loss of coastal natural environments and supporting systems. It requires a holistic management

approach in order to address the existing physical, biological and socio-cultural characteristics which define both the land and sea. The total length of coastline of the Maltese archipelago has increased through time, with the artificialisation of the coastline occurring as a result of the development of coastal defences and ports. In more recent years, the percentage length of artificial coastline has remained more or less stable at approximately 20.78 %. Replacement of a gently sloping rocky shore with a vertical artificial coastline, reduces the surface area and light conditions available for algal belts along the shoreline changing the composition of algal communities, besides encroaching on and potentially destabilising an otherwise natural system. Continued efforts are required to safeguard the coastal resources from development (particularly during peak summer season), and to protect both the coast and its biodiversity. Integrated Coastal Zone Management seeks to promote and maintain the sustainable development of a defined coastal area. Furthermore, the land use plans adopted in Malta and Gozo include provisions that direct development in certain coastal areas, whilst safeguarding other parts of the coast from development and to ensure public access to the coast.

Sustainable Use of Resources: Marine and Fresh Waters

- 4.29 The compact nature of Malta invigorates intense pressures on fresh and marine water resources, albeit important to national economic and social development. Urban development and activity, agriculture, waste management, maritime activity and potentially global warming and climate change, take their toll on water resources. Water use is estimated at 110 L/capita/day, one of the lowest in the EU. Nevertheless, the four main water sources: groundwater (regulated by mean annual recharge) (61 %), desalinated water (29 %), rainwater (7 %), and treated wastewater (3 %) are still strained, Malta having the lowest access to natural freshwater resources in the EU. Good water governance is thus essential in managing the demand induced by dense population, and high relative tourist levels.
- 4.30 The Environmental Attitudes and Behaviour survey reveals that two-thirds of respondents (61 per cent) were highly concerned about water pollution. Nevertheless the study also reveals that there is less concern about freshwater pollution when compared to other environmental issues.

Challenges

4.31 *High Water Stress*

Malta has designated 15 groundwater bodies under the Water Framework Directive processes. 13 are in good quantitative status, with poor quantitative status assigned to Malta's Mean Sea Level Aquifers (Malta and Gozo). Water (piezometric) level monitoring data shows that this has remained stable.

Most of the groundwater (approximately 80 %) is abstracted from the mean sea level aquifer (estimated capacity of 1.5 billion m³ per annum), exceeding sustainable levels, and impairing its quantitative and qualitative status through seawater intrusion, albeit stabilising in the last 10 years.

The agriculture and domestic sectors have the highest demands of groundwater, the latter further blended with Reverse Osmosis desalinated water from one of three desalination plants at Pembroke, Lapsi, or Ċirkewwa. Total water production between 2008 and 2015 was stable, despite the noted increase in population over the same period. This is indicative of improved Water Services Corporation efficiency, attributed to adopted water management programmes. Approximately 43-46 % of the total potable water produced pertained to groundwater

(equivalent to approximately 13,438,345 m³ in 2015, and equivalent to approximately 37 % of the total estimated groundwater abstraction), and 54-57 % to desalinated water (equivalent to approximately 17,803,909 m³ in 2015).

4.32 *Quality of Groundwater Bodies*

Most groundwater bodies show high nitrate levels, (exceeding the 50mg/L threshold set by the EU Nitrates Directive) while mean sea level aquifers show stable nitrate levels and perched aquifers show an upward trend in nitrate concentrations within the review period. Chloride levels, which can indicate seawater intrusion, are high in five water bodies out of fifteen. The presence of chemical contaminants, including pesticides, is not a concern in groundwater bodies. Nevertheless, the perched aquifers, with estimated capacity of 13 million m³ per annum, are vulnerable to pollutant infiltration, and over exploitation.

4.33 *Inland and coastal water pollution risks*

Pollutants are potentially released into the environment via different diffuse or point sources such as urban waste water landfills and spoil grounds, aquaculture, other sea-based activities, industry, storm waters, sewage overflows, and agriculture (including animal husbandry), desalination plants, and atmospheric inputs.

Contamination in inland surface waters is low, with no trace found of 40 chemicals out of the 47 monitored (which include amongst others PAHs, pesticides, heavy metals, plasticizers, and solvents, as per Schedule IX and X of S.L.549.100) in 2011-2012. Only 7 chemicals were detected in one or more of the water bodies, with the plasticiser Di(2-ethylhexyl)phthalate (DEHP), nickel, and lead being present in all water bodies at levels which do not exceed safe levels.

The majority of contaminants monitored are also not considered to be of concern to Malta's coastal waters. Furthermore, 93% of all bathing water samples reached excellent quality criteria as stipulated by the Bathing Water Quality Directive. Nevertheless the three watercourses delineated for the purpose of the Water Framework Directive show very high nitrate concentrations, primarily attributed to agricultural activity. Furthermore mercury was the most common contaminant detected in the sea water column from all sampling stations. Naturally occurring background levels of mercury in the Mediterranean and anthropogenic sources which could be contributing to increments in mercury in Malta's waters still need to be understood. This data gap is currently being addressed.

Continued efforts are required to prevent and control pollutant releases into the environment by: monitoring the sources of hazardous chemicals importation; controlling excess farm manure discharges in sewerage systems and excess salt, factors which disturb the biological process of the treatment plants, leading to poor performance of the plants where these discharges enter; the continued monitoring of aquaculture activities and how these effect the nutrient balance of the sediment; the continued monitoring and prevention of small scale marine oil spill incidents; and limiting the potential contamination of the water column by historic contaminants that have accumulated in the sediments.

4.34 *Ecological status of inland surface waters and transitional waters*

Inland surface and transitional waters play a key role in terrestrial and coastal biodiversity, and continued ongoing efforts seek to improve the understanding of the ecological status of such waters, and their dependence on the complex dynamics sustaining them.

4.35 *Nitrates in coastal inlets*

Harbour areas are particularly vulnerable to nutrient enrichment, possibly also resulting from nutrient loaded land runoff. Coastal inlets are prone to higher nitrate values than open coastal waters, and also more vulnerable to eutrophic conditions. Continued assessment will help monitor and determine the nutrient enrichment risks posed to harbour areas or coastal inlets.

4.36 *Managing and safeguarding the quality of the marine environment*

The marine environment's biodiversity, and ecosystem services it provides (potable water and fisheries) accentuate the importance of improving the management of the myriad of uses that depend on it (aquaculture, underwater pipelines and cables, shipping, leisure and recreation, oil and gas exploration, renewable energy potential, water abstraction, and waste). Management of water resources is based on the implementation of the two overarching policies: the Water Framework Directive and the Marine Strategy Framework Directive. Both processes include programmes of measures targeting the sustainable use of water resources and achievement of good status. However, one important aspect for effective management of such resources is the need for knowledge improvement which will be sought through monitoring processes. Such processes depend on the establishment of a refined set of measures that directly impact the pressures affecting the marine environment; and the quantification of the performance of such measures in reducing the pressures, hence monitoring progress.

4.37 *Introduction of non-indigenous species*

'Non-Indigenous species' (NIS) are marine species that are found outside their natural range whereby natural shifts in distribution ranges do not qualify species as NIS. The main sources of NIS in the marine environment are shipping and floating structures, culture activities and aquarium trade. Their presence is due to intentional or unintentional introduction resulting from human activities. In 2013, 56 NIS were recorded from Maltese waters, however 2015 published literature report 73 NIS. NIS in Malta mostly originate from the Indo-Pacific or Red Sea and Indian Ocean, whereby shipping is one of the main sources of introduction, followed by aquaculture.

4.38 *Sustainable fishing*

The cumulative fishing activity of industrial and artisanal commercial fishing; recreational and sport fishing; and illegal, unregulated and unreported fishing puts pressure on the sustainability of fish stocks. Such practices in turn result in changes to stock structure; changes to marine animals living both in the water column and the seabed; destruction of seabed habitats; effect marine species that are not the intended catch; and the introduction of noise and material that could affect biodiversity.

Regional stock assessments for both demersal and pelagic commercial species consider most demersal species to be fished unsustainably, although the level of pressure exerted by Maltese fishing on shared stock is unlikely to be significant. The status of tuna shows improvements, mainly attributed to compliance with catch limits, while that of the swordfish is uncertain.

4.39 *Marine litter and microplastic pollution*

Marine litter in the local coastal waters is of concern. Present data suggests that their levels are comparable to those in other neighbouring countries. Floating marine litter densities were higher within harbours and bays than in offshore waters. Offshore waters exhibited a highly heterogeneous distribution of floating litter, with patches of relatively high concentrations of litter being observed at distances varying between 200-800m from the shoreline. Micro plastics is an aspect of marine pollution that is receiving increasing attention due to its ubiquitous occurrence in marine habitats, including surface waters and the water column, biota, marine

sediments, sandy shores, and marine organisms. Micro plastics result either from fragmentation and weathering of larger plastic litter items, or from pre-production plastic pellets, industrial abrasives and consumer products.

Sustainable Use of Resources: Resources and Waste

4.40 Malta's economic system is dependent on the flow of industrial supplies (primary, semi-finished, and finished), capital goods, consumer goods (food and beverages, durable goods, and others), fuels and lubricants; the bulk majority of which is imported. This model exerts pressures of high resource use, waste generation and pollution. The resources are often briefly used and subsequently mostly landfilled, leaving a lot of room to improve waste management in line with the waste hierarchy.

4.41 Waste prevention is the highest stage of the waste hierarchy and is therefore the most environmentally friendly option as the absence of waste implies that no resources have been spent and no material needs to be managed. Malta's Waste Prevention Plan, amongst others, focuses upon: the need to raise awareness on the importance of reducing waste arising through behavioural changes; reducing municipal solid waste generated; minimising food waste; and limit construction and demolition waste; amongst others.

The private sector also seems ripe enough to play a more active role in waste management, whilst there are opportunities for private sector investment to contribute towards Malta's waste targets, there is also opportunity to set up and nurture a waste management industry that produces value added goods. Extended producer responsibility schemes will be required to extend their responsibility for all the waste that is generated from the stream they are responsible for.

4.42 The Environmental Attitudes and Behaviour survey reveals that the public perceive Malta's Environment, Malta's Economy, and Malta's Culture and Society as being of very high importance. Nevertheless citizens were moderately concerned on waste management issues, where citizens are very much guided by the waste separation structure in place, and associate waste management with local councils. The latter may be indicative of public association of waste management with local cleanliness and garbage collection, and not as a national matter where waste is considered a resource.

4.43 In the 2017 Special Eurobarometer 468 on attitudes of EU citizens towards the environment, 90 % of Maltese people appear concerned about the effects of plastic products on the environment, slightly higher than the EU-28 average of 87 %.

Challenges

4.44 High generation of waste

Waste generation per capita remains high when compared to EU countries. Municipal Solid Waste (MSW) generated per capita in 2015 stood at 624kg, compared to 481kg per capita for the same year in the EU. Resource productivity has also dropped with respect to previous years indicating that we have become more 'wasteful' of resources. In fact at 2015 it stood at 1.44 EUR/kg as opposed to the EU's 2.00 EUR/kg.

4.45 *High levels of landfilling and low alternative waste management practices*

Despite a slight decrease in trend since 2014, data from 2017 show that with 86 %, the landfilling rate is more than three times the EU average of 24 %. Malta's heavy reliance on landfilling is an unnecessary pressure on its limited land, and there is progress to make on areas requiring reform.

Construction and demolition (C&D) waste accounted for 80 % of total waste arising in 2015. The majority of C&D waste is being recovered through the backfilling of spent quarries. Whilst the restoration of quarries to open spaces is positive, this needs to be substantiated with an assessment of the amount of void space available, developing a long-term plan for the recovery of such waste. Furthermore, the reduction and recycling aspects of C&D waste need to be addressed. The Waste Management Plan puts forward recommendations for engaging stakeholders to find solutions thereto which, amongst others include innovative excavating processes for large sites as well as encouraging material reuse (discussion for geology and minerals below also refers).

Malta's municipal solid waste recycling rate is only 6 %, far below the EU average of 46 % and the 2020 target of 50 %. Composting in Malta is practically non-existent (compared to an EU average of 17 %). According to the "Early Warning Report" Malta was provided with a set of recommended key priority actions, which also identified municipalities a key players in the system.

2013 and 2015 represent the years where the lowest commercial and industrial waste recycling was achieved at 28 % of total waste arising down from a high of 76 % in 2011. The landfilling of such waste rose from a low of 20 % in 2008 and 2009, to 47 % in 2013 from which levels it has dropped to 35 % in 2015.

Malta achieved a packaging recycling rate of circa 38 % in 2015, from recyclables collected at the bring-in sites and through kerbside initiatives, and subsequently transferred to public and private Material Recovery Facilities (MRF) for manual and mechanical sorting and eventual exporting for further treatment. Strengthening the requirements for extended producer responsibility (EPR) schemes for packaging is also required to promote recycling considerations when designing a product.

The majority of the hazardous waste stream is potentially recyclable or recoverable, such as the regeneration of waste oils, the regeneration of waste solvents and the recovery of precious metals and other metallic components from waste electrical and electronic equipment. Whilst recognising that Malta's hazardous waste component makes up 2% of the total waste stream, and hence local recovery poses difficulties due to economies of scale, the reduced recovery of this waste stream, and its mass storage until it's feasible to export are of concern.

Continued efforts are required to permit facilities operating in various sectors such as Waste Electrical and Electronic Equipment (WEEE), End of Life Vehicles (ELVs), Metals, Recyclables, Waste Lead Acid Batteries, Other Hazardous Waste, Tyres, Other Non-Hazardous Waste, and Container Storage Yards, also ensuring environmental quality. The increased regularisation, upgrading, and continued development of such treatment facilities in Malta enhances performance vis-à-vis targets WEEE and ELV recycling.

Malta's size and island status pose a number of unique challenges that hinder its eco-innovation performance, and the required shift to a more circular economy. The circular (secondary) use of material in Malta was 5.2 % in 2016, decreasing from 10.2 % in 2014, however remaining above the 2010 level of 4 %.

4.46 *Need to strengthen waste enforcement capabilities*

Waste management compliance and enforcement functions still need to be strengthened further to encourage a level playing field amongst economic operators and to reduce the number of 'free riders' compromising the efficiency of the regulatory framework in place. Furthermore increased public collaboration with Local Council waste collection schedules is also encouraged, also contributing to the performance efficiency of the waste regime.

4.47 *Limited waste data quality*

The lack of precise quantitative and qualitative data on waste and its composition, and the true cost of waste management operations may not be accurately known. There is an increasing need for better resolution of waste data in order to facilitate a regulatory framework that apportions the costs to those who pollute more. This includes incorporating local councils in reporting programmes on the household and recycled waste managed by their locality, as well as commercial, and other waste streams they may manage. Such a reporting system will help the enforcement capacity in identifying the real players affecting the waste collection system, and implementing means to improve the waste performance of those players that are still at default. The compilation of independent household waste and commercial waste data also contributes to efforts in addressing recyclable losses at source, and facilitates waste auditing that identifies system inefficiencies, with aim of moving towards higher recyclable yields.

Sustainable Use of Resources: Geology and Minerals

4.48 The extraction of limestone for construction use characterises Malta's minerals industry. The use of limestone in Malta's built environment has a cultural and historical value, forming part of the integral makeup of Malta's historical sites, and older urban settings. Malta's globigerina limestone (ġebbla tal-franka) has been recently designated as a Global Heritage Stone Resource (GHSR).

Quarry licenses for mineral extraction are regulated, as is the consideration of new quarries or vertical and lateral extensions to quarries which requires a planning permit, and the operations of the mining activity which requires an environmental permit. The comprehensive permitting process seeks to regulate the activity by safeguarding the conservation of mineral resources, protecting the environment, and giving regard to social and community issues such as fair competition, price regulation, and quality standards. Mineral extraction is known to have a significant impact on the environment, being a source of noise, vibrations and dust, and leaves a permanent scar on the landscape.

Challenges

4.49 *Limited data on mineral production, resources and reserves*

Data on mineral production, resources and reserves merits further consolidation. The formulation of regularly-updated projections of resource stocks through geo-technical surveys, based on recent trends, will allow for efficient resource management of in terms of stocks.

4.50 *Environmental costs of limestone use are not internalised*

In 2015 approximately 70 % of construction and demolition waste arising constituted of limestone. An assessment on how to internalise the environmental costs into the price of the resource may encourage greater use of re-used and recycled material, and reduce construction,

demolition and excavation waste. The cost must incorporate the environmental impacts associated with resource extraction, the lifespan of the mineral stock, and the costs of finding and facilitating market substitutes. Due consideration will also need to be given to how such a measure will affect cultural heritage conservation efforts.

4.51 *Need to assess the availability of building material alternatives*

Research into cost-effective methods for reconditioning stone blocks from smaller material and assessments would allow for comparisons between limestone and other building materials, in order to establish which materials, or combination of materials, including possibly certain waste streams, perform best in terms of all aspects of resource efficiency.

4.52 *Control and mitigate negative environmental affects that are a by-product of quarrying*

ERA oversees the implementation of regulations and legal obligations related to quarry operations in terms of monitoring of vibration levels from blasting operations. Given the environmental concerns associated with these vibrations, the Authority issued a terms of reference and a guidance document on vibration monitoring of quarry blasting, with the aim of improving quarry environmental performance by providing quarry operators with details as to how and what is required in order to monitor vibrations from blasting operations. These guidelines also clarify the responsibilities of the operators, stipulate threshold levels for vibration monitoring and determine other specifications related to location, design and sensitivity of the monitoring equipment. The terms of reference (TORs) also specifies the documentation that needs to be submitted to the Authority prior to the commencement, and upon completion of the blasting operations. Continued enforcement is required to regulate quarry operations, while good neighbourliness is encouraged, whereby overspills are contained to the extent of quarry sites, and visual disturbance of quarries to adjoining landscapes are mitigated.

4.53 *Need to implement the continued restoration of quarries, not limited to the quarry's afterlife*

Quarry operations scar the rural landscape for the duration of the quarry's operations, sometimes also imposing on sites of otherwise natural, geological, and cultural importance. Quarry rehabilitation that addressed various alternatives for the after use of such sites, including for the promotion of biodiversity, geo-diversity and cultural heritage, and recreational areas or visitor attractions is encouraged. Quarry rehabilitation operations may be undertaken in areas that are to be restored, even while other areas within the same quarry are being excavated. In this manner reuse or recycle overspill material from the same quarry may be used in restoration prior to further excavation.

4.54 *Need to establish a minerals extraction policy framework*

The development of a comprehensive policy framework is required for the improved management of Malta's mineral resources, incorporating a detailed assessment of the state of play of this industry.

Enhancing our Natural Capital

4.55 The Maltese Islands have a diverse variety of species. Karstland habitats contain temporary rainwater rockpools that house specialised and often rare species like the Maltese Horned Pondweed and the Tadpole Shrimp, as well as orchid species such as the endemic Maltese Pyramidal Orchid. Sea cliffs are unique habitats that harbour several endemic species and also provide sea bird nesting sites. Endemic species, such as the Maltese Everlasting which is a rare shrub only found on the western cliffs of Gozo, typically require specific habitats that have a rare or limited distribution and are therefore vulnerable to disturbances. A new bat species for

Malta known as Savi's Pipistrelle has also been recorded. Malta's marine environment supports a rich biodiversity with some key species, like Posidonia meadows, that support a diversity of species, including endemic species like the Maltese Top Shell.

- 4.56 Malta's biodiversity continues to experience various pressures and threats, with natural biotic/abiotic processes, invasive/other problematic species and genes, natural system modifications, human interference and disturbances, and natural system modifications being the most significant pressures, and geological events and natural catastrophes featuring amongst the most prominent of such threats.
- 4.57 The Environmental Attitudes and Behaviour survey reveals that the public is generally uninformed about biodiversity, ecosystem services, protected species and protected areas in Malta. They are also not informed on permissions required to own objects derived from protected species, or to own a protected species and permissions required for the cutting or uprooting of trees. Furthermore whilst 60% of the respondents have heard of Natura 2000, most of the respondents did not know what it represents. Regardless, 90% of the respondents showed agreement with the importance of the role of biodiversity on the environment, in their health, and in the economy.

Challenges

- 4.58 *Biodiversity protection needs to be better integrated into sectoral policies*

The improved implementation of policies, legislation and international agreements by: sustaining a comprehensive policy framework for biodiversity and ecosystems conservation, and the continued integration of biodiversity considerations into sectoral policies; should help improve the status of biodiversity in urban areas and increase the connectivity of the national ecological network of protected areas by creating corridors.

- 4.59 *Implement management measures of Natura 2000 sites*

As of end 2011, Malta had 27 terrestrial sites covering 42.7 km² or 13.3 % of land area, and by June 2018 protected areas in the marine environment covered about more than 35 % of the Maltese waters. The continued establishment and implementation of management plans and legal provisions for all terrestrial Natura 2000 sites in the Maltese Islands ensures the control/removal of alien species, and habitat and species restoration to a favourable conservation status across their natural range, with a focus on those species and habitats which are of priority and have an unfavourable conservation status. The increased awareness of the Natura 2000 amongst the general public and relevant stakeholders is also required to improve the overall status of these sites through collaboration.

- 4.60 *Limited biodiversity awareness*

Malta adopted the first national comprehensive biodiversity policy entitled 'Working Hand-in-Hand with Nature' in 2012. Malta's NBSAP establishes a vision in which the Maltese citizens have a pivotal role in safeguarding nature in their daily lives with sustainable and resources-efficient choices and actions and an appreciation of the importance of Malta's biodiversity. It identifies that we are to continue working to further enhance biodiversity awareness with a focus on practical actions in relation to biodiversity and permitting; Strengthen collaboration and communication with stakeholders including educational institutions and NGOs in order to involve citizens in the safeguarding of biodiversity through participatory conservation and citizen science.

4.61 *Continue to improve the knowledge base on Maltese biodiversity, and give value to its services*

Reports of the conservation status of habitats and species of Community Importance, show that 40 % of species, and 43 % of habitats have a favourable conservation status. The improved reported conservation status as is being reported, could be attributed to new knowledge and improved interpretation. Further efforts in addressing knowledge gaps in required, whereby ecosystems and the services they provide are also mapped, supported and safeguarded. This will also facilitate the valuation and development of detailed natural capital accounting systems.

4.62 *Introduction and eradication of invasive alien species*

Certain invasive alien species create significant socio-economic impacts, such as plant pests that are a scourge to the agriculture and horticulture sectors, resulting in crop and plant losses or those species that cause health problems. Without a doubt the increase in the introduction of invasive alien species and, the resulting environmental and financial implications, is a burgeoning concern also in the Maltese Islands. Some introductions of invasive alien species into the Maltese countryside may have been done deliberately by misguided individuals. The National Strategy on Invasive Alien Species & National Codes of Good Practice on Invasive Alien Species have been drafted primarily to prevent the introduction and spread of new, potentially invasive, alien species. Nevertheless these are supported by ongoing eradication programmes in priority areas.

4.63 *Enhance efforts to curb illegalities, supporting timely conservation actions*

Improved surveillance and monitoring systems and methods ensuring the necessary knowledge and data availability, in conjunction with smart and streamlined approaches to site and species permitting procedures should help increase effective and timely conservation actions. Hunting and trapping practices should remain aligned to the requirements of the Birds Directive. by continuing the enforcement efforts and through more effective regulation. The presence of enforcement officials in the countryside to combat bird crime has doubled. However, continued and strengthened coordination and cooperation between relevant entities is needed to continue curbing such illegalities.

Enabling Change & Empowering compliance: Policy Responses

4.64 Malta continues to principally rely on legal instruments to respond to environmental challenges. Malta's ongoing efforts for compliance with EU environmental obligations is reflected in the decrease in the number of infringements since 2009, with only 2 active infringements in 2015. National environmental management continues to endeavour the adoption of other instruments in support of the existing legal framework.

4.65 Government expenditure on environment protection increased from 3.7 % to 4.9 % between 2008 and 2015. Environmental expenditure increased by 49 % from the 2008 level and reached an all-time maximum of EUR 187 million in 2015. Water supply, sewerage, waste management and remediation activities sector dominate Malta's green job typology, which contributes to 2% of the total employment in Malta. Revenue from environmental taxes amounted to 2.9 % of GDP in 2015, mainly constituting in energy and transport taxes.

4.66 Maltese respondents to repeated Eurobarometer surveys claimed that the most effective way to tackle environmental problems is through ensuring better enforcement of existing environmental legislation. While voluntary schemes are becoming widely used, there is still considerable potential for business and public organisations to become more involved, possibly through better promotion or provision of more incentives to apply for these schemes.

Challenges

4.67 *Asses and monitor the costs and benefits for environmental policy*

Policy responses used by governments to address environmental issues make use of various environmental policy instruments. These typically include economic, legal and voluntary instruments, as well as measures related to awareness raising and education. The evaluation of the existing policy framework by assessing whether existing approaches have been effective and if not why, influences the choice of instruments in upcoming policy. This in turn enables policymakers to identify whether other instruments should be employed instead of, or in conjunction with, existing instruments and to ensure synergy with other related policy instruments to avoid undermining the effectiveness of existing instruments or duplication of any associated costs. Economic instruments typically include fiscal and other economic incentives and disincentives so as to integrate environmental costs and benefits into the budgets of various sectors, such as households and industry, with the ultimate aim of encouraging environmentally sound and efficient production and consumption. Regular cost-benefit analysis of environmental policy facilitates the weighted understanding of environmental policy performance in terms of achieving its aims (benefits), as well as the costs incurred in trying to establish whether such costs can be better rationalised. The challenge is to find an economic model in which the environment is the driver of growth, whilst redesigning the global and national economic models so that countries generate growth and improve quality of life without detrimental effects on the environment. Hence the ultimate deliverables would be a greener economy which better integrates environmental considerations across national policy and projects, the improvement of general government expenditure on environmental protection, and addressing long-term sustainability issues through the improvement of environmental quality, and the efficient and sustainable use of resources.

4.68 *Better integration of environmental needs across all sectors*

Environmental Policy Integration (EPI) seeks the integration of environmental objectives into non-environmental policy areas, such as energy, agriculture and transport; supplementing corresponding environmental policy practices. The successful reconciliation of global objectives and international rules with domestic needs and laws is challenging, it however ensures successful stakeholder collaboration in achieving national objectives and key priorities, not only in the environmental field but also in areas that impact upon or are impacted by the environment. The environmental policy integration process exploits synergies and addresses potential conflicts across sectors, balancing the performance of the environmental pillar of the Sustainable Development Act with the social (including human) and economic pillars.

Increased efforts to be party to an Inter-Ministerial Committee (IMC) framework is an important mechanism to enhance environmental policy integration, whereby key representatives from different Ministries are included for the specific sectoral policy for which each Committee is set up.

Furthermore, the effective integration of environmental considerations early on in a project timeline: at the national funding plan or programme design; and at project level development and application submission, encourages their recognition and adoption throughout the process. This can be supported by providing continued advice to government on environmental policy in different sectors, having an environmental plan that is dynamic and agile in view of emerging risks, and ensuring micro-level planning in all aspects of urban planning.

4.69 *Improve the communication of environmental data, authorized permits, and environmental awareness*

Improved communication and increased awareness of ERA roles and remit are the heart of strengthened cross-cutting synergies between the environmental strategy and other local national strategies and action plans.

Enhanced awareness of environmental issues, assessment, policies and legislation, may be supported by the improvement of digital public services and its ongoing maintenance of supporting data or information. The publication and presentation of the reports, data and spatial data that already supports the implementation of environmental law, through intuitive digital services (foreseen in the INSPIRE Directive) and the making of that information readily available to other public authorities and the public, ensures continuous transparency of efforts towards an improved overall wellbeing.

The consistent and transparent communication of environmental permits and the enforcement of environmental legislation, sustaining the structured environmental and industrial permitting regime, also allows for a better informed public, promoting environmental compliance, monitoring and enforcement and offering assurance on how significant risks are addressed.

Such a framework continues to support access to justice, whereby the public is given the necessary information, assistance, guidance and protection to promote educational and environmental awareness, as per the aims of the Aarhus Convention. This is perceived to enhance public participation in environmentally-related decision-making. Public participation may be further improved to ensure that costs of legal challenges are not prohibitively expensive.

4.70 *Embark on the opportunity to extend the environment education role*

Citizen choices are influenced by a societal environmental ethic that is grounded with a basic understanding of how our daily livelihood systems are supported by the environment we live in. Education through increased quality public information, awareness, and participation hence plays an important role, invigorating environmental efficient choices within the individual sphere. There is opportunity to further expand the environmental education role, by encouraging environment-related voluntary initiatives, and enhancing the government and NGO management of Natura2000 sites. Enhanced environmental education initiatives also equips the public and stakeholders with the incentive to actively participate in an informed decision process.

4.71 *Strengthening of environmental enforcement and environment liability*

Environmental enforcement can be strengthened by adopting and by stepping up proactive initiatives in implementing the Environmental Liability Directive (ELD), including the setting up of financial security mechanisms for environmental liabilities. Supporting such initiatives by informing the public about environmental damage, promoting compliance efforts, monitoring efforts, and enforcement efforts, and providing more information on how professionals dealing with environmental crime work together.

Commitment to ensuring that the Environment and Resources Authority has the operative remits to effectively avoid and reduce adverse environmental impacts, also strengthens environmental enforcement. This can be extended to the improved integration of environmental considerations in development planning decisions and related follow-ups and by ensuring the timely reporting of data; and the introduction of an environmental court.

4.72 *Continue to promote a transition to a Circular Economy*

The circular economy presents an alternative model to the linear economic model, recognizing the central role of the environment and its functions, and its interactions with the economic system. Transition towards a circular economy requires the support of innovation in the business models, stimulating investments in green products and services. A circular business model limits the environmental footprint of infrastructural developments, and hence seeks to maximise resource efficiency at an individual business level. There is an opportunity to stimulate such efforts and effective investments in eco-innovation, through the Green Public Procurement, use of market-based instruments, and environmental taxation. Green Public Procurement offers the added prospect of promoting and implementing environmentally positive procurement practices, whilst fostering and potentially financing a green economy in the process.

4.73 *Further the promotion of an Environment Fund*

Malta is participant in various European structural and investment funding schemes that intrinsically oblige Member States to promote environment and climate in their funding strategies and programmes for economic, social and territorial cohesion, rural development and maritime policy. Greater participation in such funding schemes in Malta may be encouraged through more support to access these instruments, whereby environmental considerations need also be given more priority. A tax system which directs funds and revenue to environmental policy implementation further supports such schemes.

Our Neighbourhood Environment

4.74 The Environmental Attitudes and Behaviour survey reveals that over 50% of the respondents go out to the countryside once or more than once a week; and go out to the seaside once or more than once a week. Furthermore, whilst most of the respondents were satisfied with the quality of the environment in their locality the following locality level environmental concerns were identified:

- a) Over 80% think there should be more trees in their locality;
- b) Over 70% of the respondents are concerned about air pollution;
- c) Over 70% are concerned about urban problems like traffic and open space;
- d) Over 60% are concerned about land use for buildings;
- e) Over 60% are concerned about the loss of nature, species, habitats, and trees;
- f) Over 50% are concerned about noise;
- g) Over 50% are concerned about the depletion of natural resources;
- h) Over 40% are concerned about marine water pollution;
- i) Over 40% are concerned about soil degradation/erosion;
- j) Over 40% are concerned about waste management issues; and
- k) Over 40% are concerned about freshwater pollution.

Challenges

4.75 The liveability of our urban areas in terms of noise levels, air quality, cleanliness, greening, aesthetics, and access to open spaces; and access to natural open landscapes determines our quality of life. Consideration of many aspects of the earlier identified issues contribute to an improved quality of life, nourishing our overall wellbeing by improving our physical and mental health.

5.0 CONCLUSION

This paper seeks to outline the environmental challenges that are to be addressed in the upcoming NSE. The SOER 2018, the Ombudsman's Commissioner for Environment and Planning Opinion on the State of the Environment Report, 2018, together with results and analysis from a nation-wide survey on environmental attitudes and behaviour in Malta, 2017, supplemented by the 2017 and the 2019 EIRs were considered key documents. These reports provided information and data on priority environmental issues and a solid foundation upon which to develop the NSE policy scenario options that are likely to govern environmental policy up until 2050. In this manner, as from the Vision stage, work on the strategy was set in the right framework to address tailor-made long-term strategic environmental goals that the NSE is to address till 2050.

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