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NATIONAL STRATEGY
FOR THE ENVIRONMENT FOR 2050

SCENARIO ANALYSIS METHODOLOGY

JULY 2020

Introduction

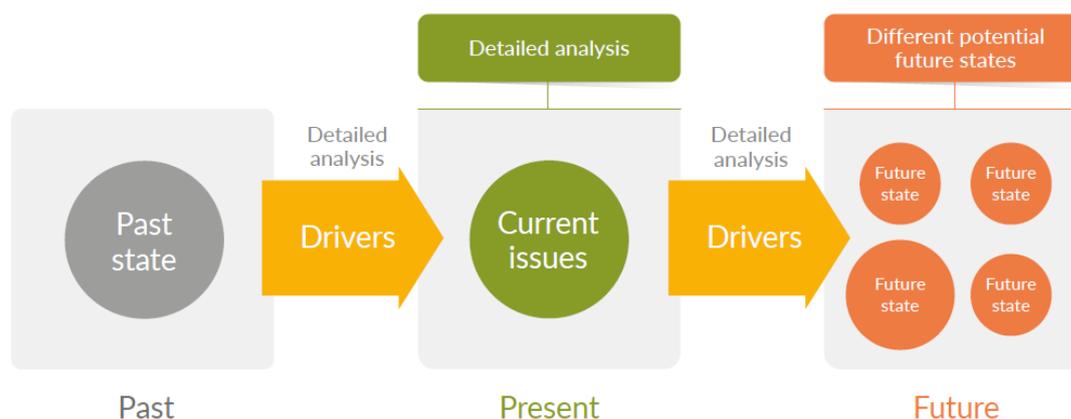
Developing a National Strategy for the Environment (NSE) spanning over 30 years allows for the establishment of a comprehensive and long-term approach to protecting and enhancing Malta's environment, hence supporting a long-term commitment which is required for an improved health of the environmental systems that support our activities. The process to develop the Strategy thus involves envisioning where we want Malta's environment to be in the next 30 years (until 2050) and establishing the strategic priorities to reach this vision. This strategic outlook will later be supplemented with detailed and plans of action covering 10-year periods (till 2030, 2040 and 2050 respectively), evaluated with intermittent reviews and updated as necessary. The strategic nature of this far-sighted outlook is matured in an interdisciplinary, forward-looking assessment and analysis of the complex and unpredictable systems that shape Malta's environment, and their future prospects.

Environmental Scenario Analysis provides the needed framework for consolidating insights from different disciplines and sectors to shed light on the complex interactions between socio-economic and environmental developments, taking them into the future. ERA applied the **Partnership for European Environment Research (PEER)** environmental scenario methodology developed under the project "METHods of Interdisciplinary Environmental Research – METIER", which recognises the need of an interdisciplinary approach in seeking solutions for complex environmental problems. PEER is a network of eight leading environmental research centres in Europe.

METIER defines scenarios as "*plausible and often simplified descriptions of how the future may develop based on a coherent and internally consistent set of assumptions about key driving forces and relationships*", a definition also promoted by the **Millennium Ecosystem Assessment**.

Scenario exercises provide a framework within which collective efforts can try to understand the possible implications of different decision pathways on the environment, and hence understanding the development of a good understanding of what forces will be driving the environment to change in the future as based on past trends. This understanding is developed on expert educated knowledge and stakeholder perspectives of past experiences (Figure 1). Scenarios can thus support the decision-making processes by providing an analytical framework for finding suitable, or robust options in addressing specific policy targets. It also facilitates thinking out of the box and the recognition of options which may not be considered when looking at the issue in question at face value. The interdisciplinary perspective intrinsic to such methodology encourages the departing from incremental environmental improvements and embarking on a systematic and systemic transformation towards wellbeing. The method has been widely adopted in international assessments such the United Nations (UN) Intergovernmental Panel on Climate Change (IPCC) assessments, the Millennium Ecosystem Assessment (2005), and UNEP Global Environment Outlook Assessments.

Figure 1: The process in understanding what forces will be driving the environment to change in the future



Different environmental analysis scenario processes adopt common broad steps that moulds itself into a unique procedure that matches the respective exercises' specific needs. The PEER environmental scenario analysis methodology moves through 4 key stages (Figure 2):

- determining the focus of the scenario planning exercise through a focal question;
- identifying the driving forces of the key environmental challenges, recognising the critical drivers and eliciting scenario logics;
- elaborating the future scenarios and scenario fiches; and
- analysing and selecting the lead scenario.

Figure 2: PEER scenario development methodology



The above key stages were approached through a deductive approach which set out to delineate the main challenges of future development and their driving forces; and examine the main uncertainties, influences and interactions that might be expected to mould the future. In doing so the scenario logics were identified, setting the framework for the detailing of scenario narratives; and analysing the scenarios.

Stage 1 - Determine the Focal Question

The focal question is an objective and unambiguous statement that is linked to the concrete choices, decisions or strategic considerations at stake. The focal question needs to encompass the general scope of the NSE and is an essential step to clarify the questions that a set of scenarios should attempt to address, guiding the otherwise intricate unwinding of a complex system. The focal question creates a common and transparent platform for the scenario process. The overarching scope of the NSE is intrinsic to the environmental scenario analyses process:

- ensuring a better and sustainable quality of life;
- providing clear and long-term direction for our environment;
- setting out national environmental targets;
- addressing the main environmental challenges Malta is facing; and
- integrating and synergising efforts of all policies and stakeholders who directly or indirectly influence the state of our environment.

The NSE process established the following focal question through discussions with the Scenario Panel:

“Are we using our environment and its resources in a manner that does not compromise environmental prosperity & overall wellbeing?”

The focal question was hence used as an overarching reference point to frame and ground the discussions to ensure a central focus throughout the scenario development process.

Stage 2 – Identify Driving Forces, Critical Drivers, and Scenario Logics

The focus of this stage shifts to identifying the expected main driving forces of environmental change which are likely to play a major role in the future. The key driving forces were identified by first eliciting the key environmental challenges from five key strategic documents (Figure 3), followed by the broad classification of the corresponding underlying driving forces as based on the literature review, and followed by consultation.

Eliciting Key Environmental Challenges

Understanding the present state of our environment and knowledge of the main challenges facing Malta’s environment, is essential to determine the drivers which have historically shaped our environment. The exercise to map environmental challenges and their drivers also sought to increase the resolution of the identified overarching goals, by defining environmental challenges that merit priority in the upcoming NSE. The mapping exercise adopted the definition of the ‘environment’ established in Cap. 549 Environment Protection Act, seeking an all-encompassing definition of the term ‘environment’ which incorporates a complex system of interlinked functions. It is understood that the status of the environmental components listed in the definition of the environment, directly or indirectly affects the following components of Quality of Life as defined by Eurostat: (i) Material living conditions; (ii) Productive or main activity, (iii) Health, (iv) Education, (v) Leisure and social interactions, (vi) Economic and physical safety, (vii) Governance and basic rights, (viii) Natural and living environment, and (ix) Overall experience of life. This exercise was also construed in recognition of the United Nations’ 17 Sustainable Development Goals.

Figure 3: Document consulted to elicit the present key environmental challenges

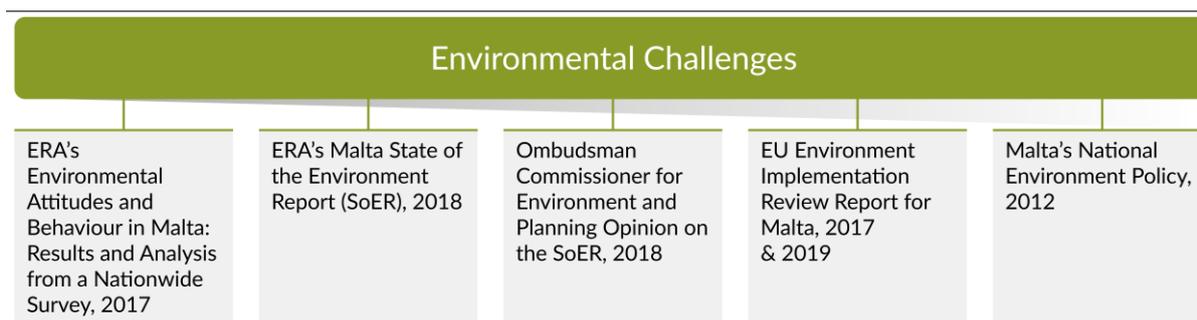


Table 1 below lists a summary of the identified key challenges which were recognised as being either a core environmental issue (such as high water stress), or a secondary effect (such as the quality of groundwater bodies, being threatened by high water stress). A detailed overview of these challenges is presented in the NSE: Recognizing Malta's Environmental Challenges paper, published on the ERA website.

Table 1: Summary of key environmental challenges

THEME	KEY CHALLENGES
Safeguarding Environmental Quality: Air	High levels of ground-level ozone, especially in rural areas
	High levels of PM ₁₀
	High levels of nitrogen dioxide in traffic-prone areas
Safeguarding Environmental Quality: Environment and Wellbeing	Limited access to open space or safe environments conducive to physical activity
	Limited planning for environmental noise, and integrating solutions in land-use and transport planning
	Limited understanding, awareness, and management of chemical flows through our food and living systems
	Excessive coarse dust emissions
Addressing Climate Change	Levels of GHG emissions
	Limited national preparedness and resilience to future climate change impacts
	Restricted synergies between climate change policy and other policies
Sustainable Use of Resources: Land and Coast	Limited integration of land-use into coordinated decision making and policy development to maximise land-use efficiency
	Lack of integration of the ecosystem approach into urban planning and development
	Restricted understanding and management of vacant dwelling stock
	Need to rationalise development in the countryside
	Need to value and manage the costs of land degradation and soil erosion
	Need to strengthen environmental stewardship in agriculture
	Need to renew afforestation efforts
	Need for integrated coastal zone management that continues to curb pressures of economic activities on the natural environment
Sustainable Use of Resources: Marine and Fresh Waters	High Water Stress
	Quality of Groundwater Bodies
	Inland and coastal water pollution risks
	Ecological status of inland surface waters and transitional waters
	Nitrates in coastal inlets
	Managing and safeguarding the quality of the marine environment
	Introduction of non-indigenous species
	Sustainable fishing
Marine litter and micro plastic pollution	
High generation of waste	

Sustainable Use of Resources: Resources and Waste	High levels of landfilling and low alternative waste management practices
	Need to strengthen waste enforcement capabilities
	Limited waste data quality
Sustainable Use of Resources: Geology and Minerals	Limited data on mineral production, resources and reserves
	Environmental costs of limestone use are not internalised
	Need to assess the availability of building material alternatives
	Control and mitigate negative environmental effects that are a by-product of quarrying
	Need to implement the continued restoration of quarries, not limited to the quarry's afterlife
Enhancing our Natural Capital	Need to establish a minerals extraction policy framework
	Biodiversity protection needs to be better integrated into sectoral policies
	Implement management measures of Natura 2000 sites
	Limited biodiversity awareness
	Continue to improve the knowledge base on Maltese biodiversity, and value its services
	Introduction and eradication of invasive alien species
Enabling Change & Empowering compliance: Policy Responses	Enhance efforts to curb illegalities, supporting timely conservation actions
	Assess and monitor the costs and benefits for environmental policy
	Improved communication of environmental data, authorized permits, and environmental awareness
	Embark on the opportunity to extend the environment education role
	Continue to promote a transition to a circular economy
	Better integration of environmental needs across all sectors
	Further the promotion of an Environment Fund
Strengthening of environmental enforcement and environment liability	
Our Neighbourhood Environment	Ensure liveability of urban areas in terms of noise levels, air quality, cleanliness, greening, aesthetics, and access to open spaces; and access to natural open landscapes to determine our quality of life.

Drivers at national level

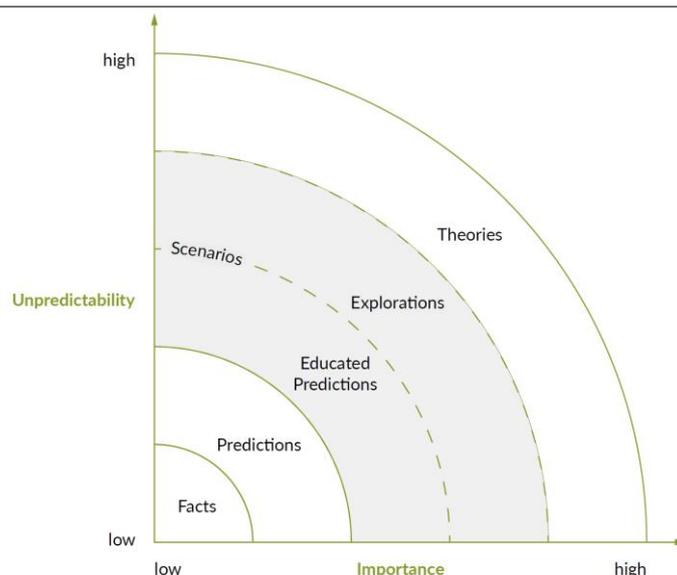
The identified key environmental challenges formed the framework for the corresponding driver classification exercise. A “STEEP” checklist of driving forces (i.e. **S**ocial, **T**echnological, **E**conomic, **E**nvironmental, **P**olicy) was used as yardstick for the exhaustive identification of key relevant direct and indirect driving forces, which are also perceived to continue exerting pressure on our environment into the future. Here drivers were understood to be those major drivers there were expected to play a major role into the future, in an understanding of their past, and the dominant megatrends influencing them (e.g. development, and urbanization trends). Drivers were also understood to be the indirect underlying drivers that are known to have an important influence on the trajectory of the direct driver (e.g. increase in population). The relevance of the identified principal driving forces was verified in collaboration with key experts in their respective environmental fields. This exercise required assigning a weighting of whether or not the pre-identified set of driving forces are indeed key in influencing the listed environmental challenges, hence eliciting the dominant driving forces in the process (Figure 4).

- Economic Growth (*the increase in the amount of goods and services produced, also giving regard to the influencing dynamics of the internet economy, artificial intelligence, and other emerging markets influencing technologies*)
 - Real Estate & Construction
 - Transport & Infrastructure
 - Tourism
 - Agriculture
 - Fisheries
 - Industry & Energy
 - Public Sector
 - Other Sectors (incorporating other sectors not already identified e.g. the variants of the service sector)

Critical Drivers

The PEER scenario building methodology provided the tools that were used to identify two driving forces, from the aforementioned list of driving forces, determined as *critical* for 2050. Critical drivers are those recognised as being **important** in determining how the future might evolve, but also characterised as having a highly **unpredictable** future projection (figure 5). The two most critical drivers are key to framing and developing four scenario options that seek to assess the future development of complex and uncertain systems. Scenarios hence establish possible future circumstance based on educated predictions that science alone cannot stipulate by using existing knowledge. Scenarios intrinsically recognise: the limits of the scientific knowledge available at that point in time, the inherent nature of unpredictability of complex systems, and the unpredictability of human choices that have yet to be made.

Figure 5: Understanding critical drivers as being important in determining how the future might evolve, but also having a highly unpredictable future projection



Targeted discussions were hence critical in the identification of the critical drivers, and the development of scenarios. Six thematic stakeholder sessions addressing Marine Environment, Environmental Quality (Air, Noise, Light), Natural Capital, Waste, Land and Fresh Waters, were held in June 2019 to further understand how drivers influence the state of the environment and improve our

understanding of how *important* and *predictable* these drivers will be up to 2050. Over 100 public entities, NGOs and academia representatives, together with over 200 business representatives were invited. Of these, around 180 stakeholders from the environmental, economic, health, technology, tourism and social policy spheres took part in these bottom-up, face to face consultation activities. At each of the sessions held, the stakeholders were asked to rate all the drivers on a given scale in terms of their *importance* and *unpredictability*, using real-time voting software. These sessions were determined essential to withhold the Authority's philosophy of maintaining consultation and to build a rapport for the benefit of a strategy that will run for thirty years.

All drivers scored high on importance and unpredictability. The PEER methodology requires the selection of the two most critical drivers, i.e. those with the highest importance and the highest unpredictability. Since the two most critical drivers were not immediately evident, the results submitted were further processed by ranking the drivers according to their scores for each variable (i.e. importance and unpredictability) and the unweighted ranks of both the importance and the unpredictability of each driver were added to elicit the most critical drivers (Table 2).

Table 2: Table of summed ranks of importance and unpredictability used in determining the two most critical drivers

CHOICES	Rank- IMPORTANCE	Importance	Rank- UNPREDICTABILITY	Unpredictability	Sum of Ranks
ECONOMIC GROWTH	4.48	11	2.92	9	20
CITIZEN CHOICE	4.36	8	3.16	12	20
UNINTENDED/UNSUSTAINABLE POLICY EFFECTS	3.97	6	3.20	13	19
REAL ESTATE & CONSTRUCTION	4.53	12	2.73	7	19
NATURAL/BACKGROUND/CLIMATE CHANGE	4.38	9	2.98	10	19
TRANSPORT & INFRASTRUCTURE (AIR, LAND, MARINE)	4.38	10	2.70	6	16
TOURISM	4.21	7	2.75	8	15
TECHNOLOGY	3.94	4	3.05	11	15
POPULATION DENSITY	4.65	13	2.53	1	14
INDUSTRY & ENERGY	3.95	5	2.68	5	10
AGRICULTURE	3.53	3	2.66	3	6
OTHER SECTORS (E.G. SERVICES)	3.05	1	2.67	4	5
FISHERIES	3.50	2	2.59	2	4

The resulting highest scoring drivers, which more or less shared the same standing, were:

- Economic growth
- Citizen choices and preferences
- Unintended and unsustainable Policy
- Climate change, natural and transboundary effects
- Real estate and construction

The PEER methodology necessitates the selection of axes which were *independent* and *unrelated* to one another as much as possible. In this regard, strongly related driving forces (from the five above) were clustered together, establishing 'Economic growth' and 'Unintended and unsustainable policy effects' as the two critical drivers upon which the scenario axes were defined. The 'Economic growth' driver is understood to incorporate 'Citizen choices' as these determine the market demand and supply. 'Real estate and construction' were acknowledged as being a strong driver locally but recognized as a sub-category of the economic sector. 'Climate change' was determined as a reality for

2050, no matter which scenario the NSE focuses on, and was thus considered applicable and significant regardless of the scenario eventually selected.

Once the selected critical drivers had been identified, an aspect of each was extracted to build the scenario axes and to reflect the Focal Question grounding this exercise: *“Are we using our environment and its resources in a manner that does not compromise environmental prosperity and overall wellbeing?”*

‘Economic growth’ and ‘Unintended and unsustainable policy effects’ formulate the basis on which the scenario logics are framed. The two drivers were used to span a matrix, depicting the two opposing extremes of each uncertainty on its axes, whereby ‘GDP’ and ‘Beyond GDP’ spanned the Economic Growth driver, and ‘Fragmented Policy Framework’ and ‘Holistic Policy Framework’ spanned the Unintended and unsustainable policy effects driver. By combining the extremes of each of the two axes, scenario logics emerge in each of the matrix’s quadrants: Me First, Market First, Sector First, and Wellbeing First (Figure 6).

The choice of the scenario titles and concepts were inspired by four environmental scenarios adopted by the United Nations Environment Programme (UNEP), in the third Global Environment Outlook Report (GEO-3²). The nature and the names of the scenarios are characterized by the leading societal attitude that dominates the particular future envisioned. The scenario logics inherently entail a specific set of assumptions about the drivers and how they develop in that future, and therefore outline the way the events in each scenario play out. The scenarios logics provide a platform to further explore the interactions and interlinkages of driving forces in a complex system with the different stakeholders of varying backgrounds, and a context within which to communicate these deliberations with different public groups. They hence provide substance to discuss and solicit opinions and views throughout the different phases of the development of the NSE, hence supporting an interdisciplinary and concerted approach when drafting the strategic policy and its supporting measures.

² UNEP 2002.

Figure 6: Scenarios matrix



Stage 3 – Develop Scenarios and Scenario Fiches

The next natural step in the scenario development process is the crystallisation of the scenario logics into a set of narratives about the future, describing how various drivers might interact and unfold in different ways until 2050.

This process was directed by the initial development of rationales for each of the four identified scenarios. These rationales were then matured further into Scenario Narratives, establishing basic qualitative descriptions of each scenario, which relate back to the original focal question. In order to develop the narratives, short explanations were developed in collaboration with the relevant experts defining how each of the identified driving forces and each overarching environmental theme are expected to form and interact within each of the four identified scenarios (Figure 7). The exercise thus contributed to the better definition of how the Population, Climate Change, Citizen Choices, Technology, Policy influences, Economy, Transport & Infrastructure, Tourism (& Recreation), Agriculture, Fisheries (& Aquaculture), Industry and Energy, Real Estate and Construction, and Fresh Waters were expected to be in 2050, under the influence of each of the 4 scenarios. This consideration of how common elements develop within the different scenarios allowed for increased comparability, and a better understanding of the contrasting scenarios. The driver-specific and theme-specific overviews were then condensed into more holistic narratives. Furthermore, graphical fiches were also developed for each scenario (vide Section 2.2.1 and Annex IV of the *Wellbeing First: A Vision for Malta's Environment – National Strategy for the Environment for 2050* for scenario fiches and full scenario text). The full Scenario Narratives were then used as content for the multi-faceted analysis exercise that followed.

Figure 7: Developing driver-specific and theme-specific overviews with key relevant experts, leading to the development of scenario narratives

		ARE WE USING OUR ENVIRONMENT AND ITS RESOURCES IN A MANNER THAT DOES NOT COMPROMISE ENVIRONMENTAL PROSPERITY AND OVERALL WELLBEING?			
		WELLBEING FIRST	SECTOR FIRST	MARKET'S FIRST	ME FIRST
SCENARIO ASPECTS FOR NARRATIVE		Strategic alignment across government entities creates a robust policy framework that contributes to an improved quality of life that endorses environmental limits. This is realised by greater collaboration among government, citizens and stakeholder groups in decision making. The removal of silos improves environmental, social and economic wellbeing dimensions of par with each other in a holistic manner.	Strong policies, albeit fragmented, are adopted in an attempt to reach specific social and environmental goals. This silo approach does not foster synergy among decision makers, citizens and stakeholder groups. Consequently, the early adoption of environmental considerations in the policy development process is not facilitated. The resulting central policies primarily shift towards economic matters.	Priority is given to the market and its economic benefits, driving efforts to converge policy choices that better market needs for overall progress. The underlying assumption is that markets on their own can correct themselves to address any distortions. As this occurs without government intervention, there is a risk of distortion and market failures. Maximum economic growth is pursued without the internalisation of environmental costs and social inequalities.	Dominant forces of consumption drive society and determine social status. Together with policy allies, these contribute towards an individualist society. The difference between wants and needs becomes increasingly blurred. Specific groups and individuals push for their own interests, be they of a financial, social or other aspect. Policy processes remain uncoordinated and adjust to further the interests of the more influential lobby groups, without due consideration of social inequalities and environmental limits.
Citizen Choices	Education level				
	Spending Power				
	Compliance/Incentive-driven	Malta shall lead by example as a sustainable society by 2050 and priority is given to the holistic well-being of society. Wellbeing is measured by broader means beyond crude GDP and properly reflects quality of life. Most citizens benefit from a high degree of employment participation, better incomes, more value-for-money, more participation value for tax paid, and an unprecedented extent of high-quality educational opportunities. Citizens' choices on practically everything shall be largely influenced by a sustainability oriented mindset that naturally factors in the social and environmental costs of citizens' actions.	Sectors of the Maltese economy shall operate upon well developed policy frameworks that generally attempt to cater for social and environmental needs apart from purely economic interests. Quality of life is still measured in terms of conventional economic GDP though this is looked upon very sceptically by numerous stakeholder across most sectors. Quality education is of a high standard but the various disciplines are too disconnected by periods; future generations with the foresight and skills that are needed towards achieving a sustainable society. This does not foster a culture that instils the need to choose wisely towards sustainable options. Diversity in spending power within a society that is extremely driven by forces of consumption, is likely to give rise to inequalities on various levels. Such differences within society define choices and are thus likely to negatively impact the synergy that is required in the best interest of the environment.	The definitive overriding factor that determines citizens choice shall be the unshackled market forces. Income, value for money on tax paid and spending power are allowed to fluctuate with no Government intervention. Market forces themselves take care of the most vulnerable in society irrespective of how they will be impacted in the short or longer term. Educational opportunities are strictly aligned to strict economic needs independently of any socio-economic or morally shifts that may be needed or the social dimension itself. There is complete reliance on market tools such as taxation levies and subsidies.	Society is strongly populist and the overall mindset is characterised by the urge to satisfy individual immediate short-term plus irrespective of anything. Citizens choice is largely dictated by the ability of individuals or specific lobby groups to satisfy their wants at all costs. An egoistic mindset prevails whereby status in society is determined almost exclusively by the extent of one's possessions, wealth or social standing. The level of education is largely determined by one's financial capability to access the most renowned institutions which, in turn, evolves into elite institutions. A significant erosion in social cohesiveness and lack of involvement therein places the most vulnerable in a seriously disadvantaged position but this state of affairs is generally deemed acceptable by the major stakeholders. Consequently, social inequalities are pronounced and the state of the environment doesn't figure much, if at all, on the national agenda. Diversity in spending power within a society that is unashamedly driven by forces of consumption, is likely to give rise to inequalities on various levels. Such differences within society define choices and are thus likely to negatively impact the synergy that is required in the best interest of the environment.

Stage 4 – Analyse Scenarios and select Lead Scenario

The PEER methodology does not establish a particular method for scenario analysis and selection. A range of different tools, with either a qualitative or quantitative focus, can be used. Two ranking exercises were adopted for the NSE scenarios, both of which sought the transparent and holistic selection of the lead scenario that will frame the Strategy’s Vision for 2050. This approach captured the expertise and opinions across most sectors of society including policy makers, policy implementers and academics (considered as the expert approach) through a multi-criteria decision analysis (MCDA) and the general public through a statistically valid Citizen Survey (considered as the bottom-up approach).

The scenarios multi-criteria decision analysis (MCDA) adopted [Tool 19 \(Identification/Screening of Impacts\) of the European Commission \(EC\) Better Regulation Toolbox](#) used for policy impact assessments, which consists of an extensive list of criteria falling into four broad categories: social, fundamental rights, economic and environmental. All criteria were given an equal weighting in the assessment process. Identified stakeholders were asked to assign a score between -2 to +2 for each criterion-scenario pair, depending on whether the scenario was expected to have a positive effect on the criterion (Table 3).

Table 3: Likert scale used in the MCDA exercise

Score	Scale Definition
-2	Strongly Disagree the scenario will have a positive effect on the criteria
-1	Disagree the scenario will have a positive effect on the criteria
0	Undecided whether the scenario will have a positive effect on the criteria
1	Agree the scenario will have a positive effect on the criteria
2	Strongly Agree the scenario will have a positive effect on the criteria
X	Not confident in providing a score

Each criterion was accompanied by key questions, intended to guide the thinking process of those carrying out the scoring. The MCDA exercise was carried out by the scenario panel, the ERA working group and by other stakeholders, including academics, policy implementers and policy makers from social, environmental, and economic spheres, as per Table 4.

Table 4: Categorization of entities which participated in the MCDA exercise

Category	Entity
Academia	University of Malta Faculty of Economics, Management & Accountancy
	University of Malta Faculty for Social Wellbeing
	University of Malta Institute for Climate Change & Sustainable Development
Executive Government – Ministries (Policy Makers)	Ministry for the Environment, Sustainable Development and Climate Change
	Ministry for Finance
	Ministry for European Affairs and Equality
	Ministry for the Family, Children's Rights and Social Solidarity
Public Administration – Entities (Policy Implementers)	Environment and Resources Authority
	Malta Enterprise
	Environment and Resources Authority Board
	Social Care Standards Authority
	Guardian for Future Generations

Each contributor was asked to assign a score for each criterion for each scenario, as per their respective competencies and respondents were asked to only assign scores for those criteria which they felt confident in responding. Average scores of the 33 entries for each criterion within each scenario were calculated to elicit the resulting outcome of the MCDA.

The Likert scale scores given by the MCDA participants were averaged in such a way as to obtain a single score for each criterion-scenario combination (i.e. 43 criteria for each of the four scenarios). The overall scores for each scenario were then obtained by adding the criteria scores for each scenario. The aggregate results are as shown in Table 5.

Table 5: Aggregated results of the MCDA exercise, showing average scores for each criterion-scenario combination and overall MCDA outcome.

		Criteria	Scenario			
			Sector First	Me First	Wellbeing First	Market First
Economic	1	Operating costs and conduct of business	-0.08	0.62	-0.62	1.40
	2	Administrative burdens on businesses	-0.20	0.62	-0.84	1.08
	3	Trade and investment flows	0.85	0.58	0.15	1.33
	4	Competitiveness (sectoral) of business	0.52	0.18	-0.02	1.20
	5	Position of SMEs	0.42	0.48	-0.24	0.56
	6	Functioning of the internal market and competition	0.90	0.68	0.25	1.30
	7	Innovation and research	0.78	-1.06	1.42	0.76
	8	Public authorities	-0.16	0.00	0.44	0.12
	9	Consumers and households	0.38	0.48	0.62	0.88
	10	Specific regions or sectors	0.47	0.56	0.13	0.40
	11	Third countries and international relations	0.23	0.08	0.88	0.13
	12	Macroeconomic environment	0.50	0.69	0.50	1.39
Social	13	Employment	0.89	0.36	0.93	0.67
	14	Working Conditions	1.00	-0.27	1.78	-0.33
	15	Effects on income, distribution, social protection and social inclusion	0.33	-0.16	1.69	-0.13
	16	Governance, participation and good administration	0.42	-1.22	1.69	-0.40
	17	Public health and safety and health systems	0.09	-0.84	1.93	0.11
	18	Crime, Terrorism and Security	0.10	-1.00	0.63	0.23
	19	Education & training, and education & training systems	0.71	-0.24	1.71	0.36
	20	Culture	0.60	-0.91	1.71	0.11
	21	Social impacts in third countries	0.09	-0.59	1.28	-0.47
Environme	22	Climate	0.30	-0.84	1.59	-0.36
	23	Air quality	0.24	-0.92	1.57	-0.21
	24	Water quality and resources	0.33	-1.14	1.55	-0.01
	25	Biodiversity, flora, fauna and landscapes	0.17	-0.76	1.42	-0.82

	26	Soil quality or resources	0.02	-1.02	1.15	-0.75
	27	Waste production, generation and recycling	0.59	-0.95	1.51	-0.41
	28	Efficient use of resources (renewable & non-renewable)	0.26	-0.77	1.06	-0.05
	29	Sustainable consumption and production	-0.05	-1.27	1.59	0.09
	30	International environmental impacts	0.37	-0.80	0.87	-0.03
	31	Transport and the use of energy	0.49	-0.73	1.59	-0.08
	32	Animal welfare	0.35	-0.70	1.05	-0.73
	33	The likelihood or scale of environmental risks	0.62	-0.72	1.53	0.12
	34	Land use	-0.25	-1.35	1.34	-0.84
Fundamental Rights	35	General	0.50	-0.60	1.18	0.25
	36	Dignity	0.48	-0.25	1.33	0.00
	37	Individuals, private and family life, freedom of conscience and expression	0.53	0.16	1.11	0.09
	38	Personal data	0.85	-0.03	1.40	0.11
	39	Asylum and protection of removal, expulsion or extradition	0.50	-0.71	0.93	0.14
	40	Property rights and the right to conduct a business.	0.13	0.27	0.42	0.60
	41	Gender equality, equality treatment and opportunities, non – discrimination, and rights of persons with disabilities	0.78	-0.65	1.58	-0.35
	42	Rights of the child	0.38	-0.81	1.78	0.00
	43	Good administration, Effective remedy/ Justice	0.56	0.00	1.47	-0.06
Overall Score (Total)			16.96	-15.59	45.04	7.36

The second adopted method was a statistically valid citizen survey with a stratified sample based on age, gender and region and of a size of 600 individuals collected amongst the Maltese population of 16 years and over, was conducted to capture the citizens' attitude towards the underlying spirit of the scenarios. The questions were developed by seasoned experts in the field of surveying, in such a way that the answers reflect the participants' preferences for certain scenarios over others. The survey was carried out through telephone interviews between the 18th and 25th October 2019, and carries a 95% level of confidence.

The results obtained from the above two methods were consolidated and weighted to elicit an overall result. Weightings of 40% and 60% were allocated to the MCDA and the citizen survey respectively, in support of the Authority's philosophy of maintaining consultation with stakeholders and to build a rapport for the benefit of a strategy that will run for thirty years. The analysis was extended further by also trying out the inverse (i.e. 60% MCDA and 40% Citizen Survey) so as to have a full picture of what the outcome would be.

A detailed representation of the Citizen Survey results are available on ERA webpage as a separate document to this documentation package covering the NSE process.

References

EC (European Commission) 2017. Better Regulation Toolbox 19: Identification/Screening of Impacts. Available at: https://ec.europa.eu/info/sites/info/files/file_import/better-regulation-toolbox-19_en_0.pdf (Accessed 01/01/2019)

Environment Protection Act 2016, Cap. 549. Laws of Malta. Available at: <http://justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=12446&l=1> (Accessed 01/11/2019)

ERA (Environment and Resources Authority) 2018. State of the Environment Report 2018. Available at: <https://era.org.mt/en/Pages/State-of-the-Environment-Report.aspx> (Accessed 01/11/2019)

EU (European Union) 2017. Environment Implementation Review Report 2017: Country Report Malta. Available at: https://ec.europa.eu/environment/eir/pdf/country-reports-archive/report_mt_en.pdf (Accessed 01/11/2019)

EU (European Union) 2019. Environment Implementation Review Report 2019: Country Report Malta. Available at: https://ec.europa.eu/environment/eir/pdf/report_mt_en.pdf (Accessed 01/11/2019)

Eurostat (2019). Statistics Explained: Quality of life indicators. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php/Quality_of_life_indicators (Accessed 01/11/2019)

IPCC (Intergovernmental Panel on Climate Change) 2000. IPCC Special Report Emissions Scenarios: Summary for Policymakers. Available at: <https://www.ipcc.ch/site/assets/uploads/2018/03/sres-en.pdf> (Accessed 01/11/2019)

Lindgren A. 2016. 8 Mighty Megatrends: Discover the tidal waves of change that break all other trends. Available at: https://issuu.com/anderlindgren/docs/megatrends_-_6_mighty_megatrends_sh (Accessed 01/11/2019)

Millennium Ecosystem Assessment 2005. Guide to the Millennium Assessment Reports. Available at: <https://www.millenniumassessment.org/en/index.html> (Accessed 01/11/2019)

PEER (Partnership for European Environmental Research) 2009. METIER Graduate Training Course No. 7 'Environmental Scenario Analysis' Course Book. Available at: <https://www.peer.eu/projects/metier-training-courses/course-7-environmental-scenario-analysis/> (Accessed 01/11/2019)

UNEP (United Nations Environment Programme) 2002. Global Environment Outlook 3 (GEO3) - Chapter 4 Outlook 2002 – 32. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/8609/GEO-3%20REPORT_English.pdf?sequence=7&isAllowed=y (Accessed 04/09/2019)