

GREENING OUR ECONOMY – ACHIEVING A SUSTAINABLE FUTURE



**MINISTRY FOR SUSTAINABLE DEVELOPMENT,
THE ENVIRONMENT AND CLIMATE CHANGE
(MSDEC)**

PREAMBLE

Economic growth patterns, growing populations, and current production and consumption patterns reliant on finite resources have adversely affected the environment, to the extent that a **‘business-as-usual’ approach, revolving around unsustainable practices, is no longer an option**. The environment and the economy are explicitly linked and can no longer be considered in isolation from one another.

It is time for a strategic vision, incorporating policies that are congruent with economic efficiency, environmental integrity and social equity, as well as coherent both at a national and an international level¹. The Green Economy is thus to be resorted to as a new source of growth; as a means to accelerate progress towards sustainable development and poverty reduction.

Moreover, as indicated in Malta’s National Reform Programme, not only does the Green Economy create jobs and monetary trade, but it also has the potential of improving well-being as a result of a symbiotic relationship between *‘economic growth’* and *‘environmental stewardship’*. In this way, better jobs and increased revenue would be managed so as to directly and indirectly contribute towards a cleaner environment, in the interests of the present and future generations.

‘Malta’s commitment to the shift to a green economy is expressed in my Government’s programme of work, through the implementation of a strategy based on best practices that put the environment at the core of decisions made while aiming to achieve economic growth that gives due consideration to sustainable development.’² – Prime Minister Dr Joseph Muscat

It follows that, this clear policy direction is in the process of being translated into concrete action, which must be characterised by substantially increased investments in economic sectors that build on and enhance the earth’s natural capital or reduce ecological scarcities and environmental risks. Such investments and policy reforms must provide the mechanisms and the financing for the reconfiguration of businesses, infrastructure and institutions and the adoption of sustainable consumption and production processes. In turn, this will lead to a higher share of green sectors contributing to GDP, greener jobs, lower energy and resource intensive production, lower waste and pollution and significantly lower greenhouse gas emissions³.

In identifying the target areas presented in this document particular consideration was given to existing obligations and commitments that emanate from the European Union

¹ Green Growth Strategy Interim Report: Implementing our commitment for a sustainable future. Meeting of the OECD Council at Ministerial Level /MIN(2010)5

² Speech by Hon J. Muscat, Prime Minister of Malta. Eco-Forum Global Annual Conference; Guiyang 2014.

³ Measuring the Green Economy, 2011

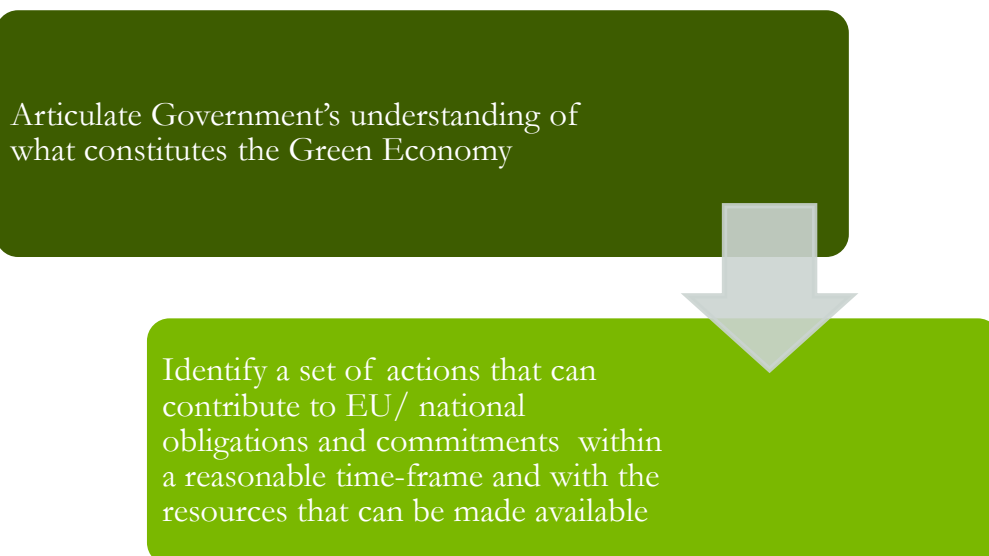
and related national targets. In this respect, the European Union (EU) has a set of environmental targets, known as the “20-20-20” targets, which set three key objectives for the year 2020, namely:

- A 20% reduction in EU greenhouse gas emissions from 1990 levels;
- A 20% share of renewable energy in the overall energy consumption and another 10% share of renewable energy in transport; and
- A 20% improvement in the EU’s energy efficiency

Nonetheless, this document does not seek to put forward policies and strategic goals, as this has already been done in other Policy and Strategy documents. Neither is it the intention of this document to articulate statements of intent or to document those actions that have some form of green credentials and that have already been delivered in the past as this too has been achieved in other publications.

This document and the action plan here identified are based on the presumption that, in order for it to enable a green economy, **the thrust of the action plan must be specific, with actions directed towards particular areas and sectors that could benefit the most in the short to medium term.**

Therefore, this document seeks to:



The span of focus has been identified and the specific actions have been developed following comprehensive discussions through the following structures, namely:

- **A Core Group** – with representatives from the main stakeholders being Ministry for Sustainable Development, the Environment and Climate Change (MSDEC), Ministry for Education and Employment (MEDE), Ministry of Finance (MFIN), Ministry for Energy and Health (MEH), and Ministry for the Economy, Investment and Small Businesses (MEIM) to co-ordinate and prepare relevant documentation;
- **An inter-ministerial group** – with senior representatives from each Ministry to consider identified potential measures and provide feedback;

- **One-to-one meetings** - with a number of Ministries/entities;
- **Initial Public consultation** – to put forward action proposals with which to ‘green’ the economy.

This document presents Malta’s commitment to green growth – a short to medium term strategy and action plan. It seeks to contextualise the nature of the Green Economy and has the purpose of bringing together all necessary objectives and actions towards a green economy in Malta; giving them a framework of structure and timeline; enhancing them and striving towards their effective realisation.

Government is mindful that the promotion of the Green Economy and the implementation of its vision for the sector can only be achieved by embracing it in its own operational structures through concrete action.

Table 1 - Plan of activities

Activity	
1. Secondary Research	
2. Internal discussions at core group level	
3. Public Consultation ⁴	
4. One to one meetings with a number of Ministries/entities: namely:	
• Ministry for Sustainable Development, the Environment and Climate Change (MSDEC),	
• Ministry for Education and Employment (MEDE)	
• Ministry for Energy and Health (MEH)	
• Ministry for Transport and Infrastructure (MTI)	
• Ministry for Finance(MFIN)	
• Malta Environment and Planning Authority (MEPA)	
• Malta Enterprise (ME)	
• National Statistics Office (NSO)	
• Ministry for the Economy, Investment and Small Businesses (MEIB)	
5. Draft Report	
6. 2 nd Round of discussions with Ministries	
7. Public consultation	<div>State of affairs to date</div>
8. Carry out economic evaluation/s	
9. Report Update	
10. Final Report Presentation	

⁴ This was held on the 7th of November 2013

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LIST OF ACRONYMS

10YFP	10 Year Framework Programme
BREEAM	Building Research Establishment Environmental Assessment Methodology
BRO	Building Regulation Office
C&D	Construction and Development
CDP	An entity that works to transform the way the world does business to prevent dangerous climate change and protect our natural resources
CEBI	Centre for Entrepreneurship & Business Incubation
CEO	Chief Executive Officer
COMETR	Competitiveness Effects of Environmental Tax Reforms
DG	Director General
EC	European Commission
ECO	Ecological/environmental
EE	Energy Efficiency
EEA	European Economic Area
EMAS	Eco-Management and Audit Scheme
EN228	European Norm petrol fuel properties
EN590	European Norm Physical diesel fuel properties
EPBD	Energy Performance of Buildings Directive
EPC	Energy Performance Certificate
ERA	European Research Area
ERF	Environmental Fiscal Reform
ETC	Employment and Training Cooperation
ETS	Emissions Trading System
EU	European Union
EUR	Euro
G	Grams
GDP	Gross Domestic Product
GEA	Green Economic Activity
GHG	Green House Gas

GI	Green Infrastructure
GPP	Green Public Procurement
GST	Global Sustainable Tourism Council
ICT	Information and Communication Technology
IEA	International Energy Agency
IGPN	International Green Purchasing Network
ILO	International Labour Organisation
IMTF	Integrated Mission Task force
ISO	International Organisation of Standardisation
Km	Kilo meters
LNG	Liquefied Natural Gas
LEED	Leadership in Energy & Environmental Design
MCAST	Malta College of Art, Science and Technology
MCST	Malta Council for Science and Technology
ME	Malta Enterprise
MEDE	Ministry for Education and Employment
MEH	Ministry for the Energy and Health
MEIB	Ministry for the Economy and Small Businesses
MEIM	Ministry for European Affairs and Implementation of the Electoral Manifesto
MFIN	Ministry for Finance
MEPA	Malta Environment and Planning Authority
MNEAP	Malta national Electro Mobility Action Plan
MOT	Ministry of Tourism
MRA	Malta Resources Authority
MSDEC	Ministry for Sustainable Development, the Environment and Climate Change
MTA	Malta Tourism Authority
MTI	Ministry for Transport and Infrastructure
NACE	European industry standard classification system
NAP	National Action Plan
NBSAP	National Biodiversity Strategy and Action Plan
NCWR	Non-Conventional Water Resources

NEEAP	National Energy Efficiency Action Plan
NEP	National Environment Plan
NGO	Non Governmental Organisation
NRP	National Reform Programme
NSO	National Statistics Office
NZEB	Nearly Zero Energy Buildings
OECD	Organisation for Economic Co-operation and Development
PPP	Public Private Partnership
PV	Photo Voltaic
RES	Renewable Energy Sources
SEWCU	Sustainable Energy and Water Conservation Unit
SME	Small and Medium sized Enterprise
SRU	Sachverständigenrat für Umweltfragen
TEN-T	Trans-European Transport Network
TM	Transport Malta
TSE	Treated Sewage Effluence
UK	United Kingdom
UoM	University of Malta
UN	United Nations
UNEP	United Nations Energy Programme
UNWTO	United Nations World Tourism Organisation
US	United States
USD	United States Dollar
WBCSD	World Business Council for Sustainable Development
WCED	World Commission on Environment and Development
WS	WasteServ
WSC	Water Services Cooperation

1. INTRODUCTION

1.1 A Global Perspective

The world economy has been transformed over the last couple of decades with major advancements in computing, communications, digitalisation, and other fields assisting in no small way in the expansion of humanity's productive capacity. World output has more than doubled since 1990⁵, accompanied by rising international flows of knowledge, trade and capital, as well as by enormous structural changes. Developing economies have grown in importance, their share of global GDP rising from just over a quarter to more than two-fifths over this period⁶. The number of people living in urban areas surged by two-thirds, to more than half the world's population⁷, with the world population expected to increase by over 1 billion over the next fifteen years.⁸

Such advancements have not been without repercussions, often revolving around resource-intensive growth models with adverse consequences on the environment. Climate change is adversely affecting the environment, the community through increased costs⁹, and people's well-being.

As a result of multiple crises (financial, economic, food, energy) affecting the world economy, governments and other bodies have critically examined the issues relating to national and global economies as to better identify opportune strategies to meet the current economic and environmental challenges, with the general consensus being that the necessary measures to be undertaken ought to be people-centred and geared towards effective and broad enhancement of the quality of life of citizens¹⁰. Based on this notion, **sustainability is inherently about improving the daily lives of billions of people, including those living in poverty, those who are unemployed, the working poor and youth.**

The green economy¹¹ is distinguishable from traditional economic models in that it considers natural and ecological capital and related services as having an economic value. Greening the economy is seen as an opportune mechanism that contributes to long-term

⁵ World GDP in 2012 was US\$73.3 trillion, up from US\$36.3 trillion in 1990, in constant 2005 international dollars, purchasing power parity (PPP). See: The World Bank, 2014. World Development Indicators 2014. 11 April 2014 release

⁶ The World Bank, 2014, World Development Indicators 2014. Data cited are for GDP (constant 2005 international \$ PPP), 1990–2012. In 1990, middle-income countries' share of global GDP was 27%; in 2012 it was 42%. Share of global GDP calculated by the authors

⁷ United Nations (UN), 2014. World Urbanization Prospects, the 2014 revision. UN Department of Economic and Social Affairs, Population Division. →

⁸ The World Population Situation in 2014. DESA – United Nations 2014

⁹ Lord Stern, former Chief Economist of the World Bank, estimated that if the world did nothing to tackle climate change then changes to global weather systems could inflict costs equivalent to between 5% and 20% of global GDP a year, averaged over time. Stern Review on the Economics of Climate Change (2006)

¹⁰ http://www.fao.org/fileadmin/user_upload/sustainability/pdf/GreenEconomy-Full.pdf

¹¹ Definition of the green economy is presented in Section 1.4 of this document

prosperity, and short-term costs are likely to be compensated by multiple potential benefits in terms of increased competitiveness, jobs, improvement of security of resource supply, including energy and raw materials, inclusiveness, health and also well-being. Numerous international studies carried out point towards the increased resilience that is built into the economy when it embraces green concepts and technologies.

Green can open new sources of growth through:

- **Productivity** – incentives for greater efficiency in the use of resources and natural assets; enhancing productivity; reducing waste and energy consumption; and making resources available to highest value use;
- **Innovation** – Opportunities for innovation, spurred by policies and framework conditions that allow for new ways of addressing environmental problems;
- **New markets** – Creation of new markets by stimulating demands for green technologies; goods and services; creating potential for new job opportunities;
- **Confidence** – boosting investor confidence through greater predictability and stability around how governments are going to deal with major environmental issues;
- **Stability** – More balanced macroeconomic conditions; reduced resource price volatility; supporting fiscal consolidation through, for example, reviewing composition and efficiency of public spending; and increasing revenues through the pricing of pollution.

Green growth will also reduce the risks to growth from:

- **Bottlenecks** that arise when resource scarcity or reduced quality makes investment more costly, such as the need for capital intensive infrastructure when water supplies become scarce or water quality decreases. In this regard, the loss of natural capital can exceed the gains generated by economic activity, undermining the ability to sustain future growth.
- **Imbalances** in natural systems that raise the risk of abrupt, highly damaging – and potentially irreversible – effects. Attempts to identify potential thresholds suggest that some – climate change, global nitrogen cycles and biodiversity loss – have already been exceeded.

Towards green growth. A summary for policy makers - May 2011. OECD

1.2 The European Perspective

The EU is striving to help citizens and governments to green their economies in an effort to create wealth without harming the environment.

In the past, economic growth was dependant on the utilisation of natural resources, however it has become evident that, due to finite resources and the adverse impacts on

the environment caused by economic growth, different economic models have to be sought, with the EU estimating that, *“by 2050, if we follow our current path, we would be extracting five times more resources that we do today. That probably won’t be possible. More than 60% of our ecosystems are already over-exploited, world fish stocks face great threats, and we are endangering the quality of our water and air by cutting down too many trees.”*¹²

The EU’s focus is on five primary pillars, namely:

- I. Better management of resources;
- II. Economic instruments that are good for the environment;
- III. Support for innovation;
- IV. Better policies for waste and water; and
- V. Efforts to boost sustainable consumption and production.

In line with the above, the European Union is pushing towards a circular economy that focuses on **reusing, repairing, refurbishing and recycling** existing materials and products as opposed to the **take-make-consume and dispose** pattern of growth – a linear model which assumes that resources are abundant and cheap to dispose of. Such a stance is to bring new growth and job opportunities. The EU estimates that better eco-design, waste prevention and reuse can bring net savings for EU businesses of up to €600 billion¹³, while also reducing total annual greenhouse gas emissions.

In this respect, a move towards a circular economy is at the heart of the resource efficiency agenda established under the Europe 2020 Strategy for smart sustainable and inclusive growth. Furthermore in July 2014 the Commission adopted a Circular Economy Package – “Towards a circular economy: a zero waste programme for Europe”¹⁴ with the European Commission to present an ambitious circular economy strategy in late 2015¹⁰.

1.3 The Maltese perspective

*“Malta’s commitment to the shift to a green economy is expressed in my Government’s programme of work, through the implementation of a strategy based on best practices that put the environment at the core of decisions made while aiming to achieve economic growth that gives due consideration to sustainable development”*¹⁵. – Prime Minister Dr Joseph Muscat

¹² http://ec.europa.eu/environment/basics/green-economy/resources/index_en.htm

¹³ http://ec.europa.eu/environment/circular-economy/index_en.htm

¹⁴ COM (2014) 398 final

¹⁵ Speech by Hon J. Muscat, Prime Minister of Malta. Eco-Forum Global Annual Conference; Guiyang 2014.

Malta is fully committed to adopting a green economy action plan. Its economic system depends largely on the availability of natural resources. Nonetheless, the country has limited resources of its own, and more often than not, these are far from being used in a sustainable way.

With respect to green jobs in Malta (further information in Section 2 of this document), a 2015 study (that builds on a similar endeavour undertaken by ETC way back in 2007 on green jobs) indicates that, though modest in size, the green economy is picking up and is employing more workers among the various industries - with such jobs residing in mature segments that cover a wide array of activities including manufacturing and the provision of public services such as wastewater and solid waste management, with a smaller portion encompassing newer segments that respond to energy-related challenges.

The National Environment Policy^{16 17} (2011) identified the green economy as one of its six objectives on the basis of which Malta's environment is to be managed and upgraded (see Box below). Indeed, this Policy is congruent with the green economy concept that has become an important pillar of major European and international strategies; most notably within the European 2020 strategy adopted by the EU in 2010 to drive sustainable growth, and in the Rio+20 outcome¹⁸ as a means for attaining sustainable development. Furthermore, the present administration initiated a cross-cutting benchmarking exercise¹⁹ with all sectors concerned.

In efforts to effectively raise awareness on Sustainable Development, this Government undertook a number of initiatives – work which includes: introducing for the first time ever briefings on Sustainable Development to Permanent Secretaries of all Ministries; the encouragement of the Focal Groups according to the Sustainable Development Act; and the setting up of orientation seminars for Sustainable Development to Local Councils.

The National Environment Policy - The six pillars relating to Malta's environment

Goal: Ensure a High Level of Environmental Quality in the Maltese Islands	
Objective 1: Greening the Economy	Integrating environmental considerations into economic development planning Market-based instruments Environmental taxation Promoting eco-innovation Incentivising the green jobs sector Enabling the private sector Greening public procurement Mobilising finance for the green economy

¹⁶ National Environment Policy Draft for Consultation September 2011

¹⁷ This document has been drawn up with due consideration to the national Environment Policy.

¹⁸ The Future We Want: Outcome document adopted at Rio+20

¹⁹ Such benchmarking exercise is carried out through the NEP coordinator

Objective 2: Safeguarding environmental health	Air quality Noise Chemicals Radiation
Objective 3: Using resources efficiently and sustainably	Stone Fresh waters Coastal and marine areas Soil Land Waste
Objective 4: A pleasant place: Improving the local environment	Greening our cities Safeguarding our built cultural heritage Improving countryside quality
Objective 5: Greening Gozo	Eco Gozo Sustainable agriculture Sustainable transport Sustainable tourism Improved resource management
Objective 6: Long-term sustainability issues	Climate change and energy Biodiversity and ecosystems Major environmental risks: improving emergency preparedness

Source: NEP

Sustainability, inclusivity, knowledge and innovation are the cornerstones of modern economic growth and form the basis of the European Union's 2020 strategy for generating growth and jobs with a number of national targets being set and to which Malta agrees to. Furthermore, through its climate and energy package the European Union has drawn up a set of binding legislation which aims to ensure that the European Union meets its ambitious climate and energy targets for 2020.

Locally, the Malta Chamber of Commerce Enterprise and Industry²⁰ too indicated the importance and necessity to improve Malta's Green Credentials highlighting the imperative need of taking the welfare of future generations into account on decisions that are made today. In its report 'Economic Vision for Malta 2014 – 2020' the Malta Chamber of Commerce Enterprise and Industry also indicates that economic activity in Malta, in relation to the Green economy by the private sector, has remained limited – restricted to the collection of waste, importation and installation of Renewable Energy

²⁰ Representing over 1,000 business entities, the Malta Chamber of Commerce, Enterprise and Industry is the largest employer organisation on the island. (<https://secure3.gov.mt/ictmalta/Page.aspx?pid=12>)

Sources (RES) and energy/resource efficiency technologies, and limited manufacturing of energy efficiency technologies such as windows and apertures among others²¹.

1.4 Defining the Green Economy

The Green Economy is not a distinct sector of activity, nor is it just about energy conservation or powering our needs from renewable sources such as solar or wind energy but involves a focused approach towards carbon footprint neutrality in general. The term encapsulates a range of economic activities spread across different sectors. This would include the energy performance of buildings, more efficient and cleaner transport systems, sustainable farming and fishing and in general finding an alternative to those processes that because of inherent inefficiencies are detrimental to the environment and in turn detract from human well-being. Thus, the Green Economy is comprised of activities in areas such as renewable energy, energy-efficient products, resource-efficient production techniques, the re-use, recovery and recycling of waste, water management and low-carbon vehicles²².

Nonetheless, to date there is no single, simple definition that is universally accepted for the term – Green Economy. The following table illustrates some of the definitions utilised to explain the Green Economy.

Green Economy Definitions

International organisations	Definition
European Environment Agency	A green economy is one in which policies and innovations enable society to use resources efficiently, enhancing human well-being in an inclusive manner, while maintaining the natural systems that sustain us ²³
United Nations Environment Programme (UNEP)	A green economy is one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive. Practically speaking, a green economy is one whose growth in income and employment is driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services ²⁴

²¹ Economic Vision for Malta 2014 – 2020. Chamber's Position. Malta Chamber of Commerce.

²² *Delivering our Green Potential*, Government of Ireland, (2012)

²³ <http://www.eea.europa.eu/themes/economy/about-green-economy> and EEA, 2012

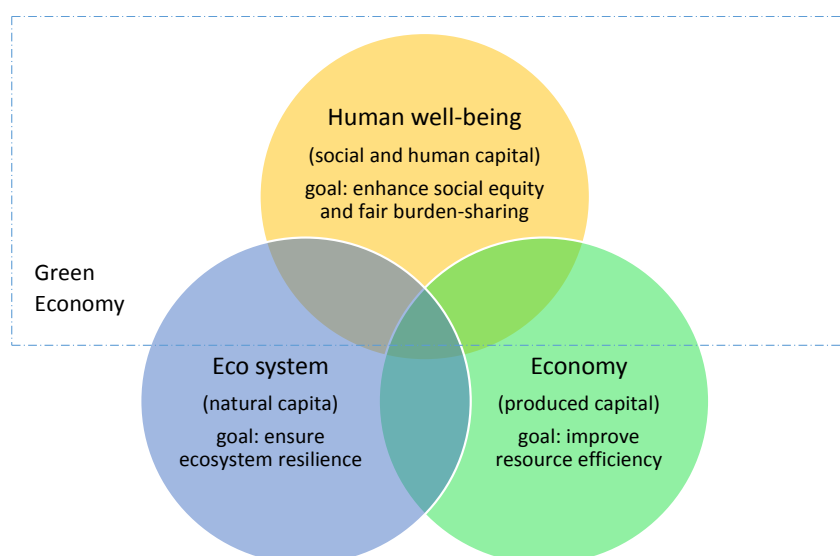
²⁴ www.unep.org/greenconomy

World Bank	Green growth ²⁵ that is, growth that is efficient in its use of natural resources, clean in that it minimizes pollution and environmental impacts, and resilient in that it accounts for natural hazards and the role of environmental management and natural capital in preventing physical disasters. And this growth needs to be inclusive ²⁶
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The various definitions do however concur that going green is characterised by three primary objectives, namely:

- i. **Improving resource-use efficiency:** a green economy is one that is efficient in its use of energy, water and other material inputs;
- ii. **Ensuring ecosystem resilience:** this protects the natural environment, its ecosystems' structures and flows of ecosystem services; and
- iii. **Enhancing social equity:** this promotes human well-being and fair burden sharing across societies.

Indeed, besides the twin challenge of boosting resource efficiency and maintaining ecosystem resilience, the integration of the social aspect or human well-being is fundamental, given the importance of basic resources — food, water, energy, and materials — as well as ecosystems services for people's subsistence needs.



Source: EEA, 2012

Within this context, the concept of green economy does not replace that of sustainable development, but can instead be understood as a way to achieve sustainable

²⁵ Green growth and the green economy are intimately linked – two sides of the same coin. Both are inputs into sustainable development, the ultimate objective of growth, development, and environmental policies.

<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTSDNET/0,,contentMDK:23185024~pagePK:64885161~piPK:64884432~theSitePK:5929282,00.html>

²⁶ http://siteresources.worldbank.org/EXTSDNET/Resources/Inclusive_Green_Growth_May_2012.pdf

development²⁷ (Bowen, 2012). *A green economy is a means to sustainable development ...essentially, the concept postulates that the transformation of the economy is a precondition for sustainable development* (Eurostat, 2013).

The impetus is towards the need for mechanisms that create an equilibrium between what is economically feasible with what is ecologically necessary. The balance is, therefore, one where actions are influenced by environmental sustainability. Indeed, when the term 'Sustainable Development' was coined by the 'Brundtland Commission' in 1987, sustainable development was identified as: *"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."*

The Malta Government concurs with this view, in that it believes that Sustainable Development is central to the attainment of sound environmental policies. In fact, the Green Economy Strategy and Action Plan has been built upon the four pillars of economic, social, cultural and environmental sustainability.

This is in line with the Rio de Janeiro RIO+20 United Nations Conference on Sustainable Development in 2012, where the Green Economy was defined as: *'an economy that results in improved human wellbeing and reduced inequalities over the long term, while not exposing future generations to significant environmental risks and ecological scarcities.'*

The above evidences the efficient use of resources: a point where environmental and economic concerns can and should converge; ensuring that due concern is given to pollution control, environmental protection, waste reduction and recycling technologies, leading to improvements in the overall economic cost of meeting our needs and leading to improved well-being.

Embracing the green economy, therefore, leads to the continuous evolution of processes, of new ways of meeting our needs, contributing to greater resource efficiency and allowing us to **break the vicious circle of: Acquire – Use – Discard.**

1.5 Our Vision

It is the Government's view that a green(er) economy is not about re-inventing the wheel or dramatically changing what we do, but is more about how we do what we do so as to maximise value and growth across the whole economy, whilst managing resources sustainably.

²⁷ A major policy attractor was the concept of sustainable development as originated by the work of World Commission on Environment and Development (WCED) in 1987. The WCED report — also known as the Brundtland report — made the case for designing strategies that would simultaneously preserve or improve the quality of the environment and ensure economic growth, and also expanded the definition of growth by speaking both of 'reviving growth' and 'changing the quality of growth' (WCED, 1987).

Our vision revolves around a green and fair economy; one that enables progress whilst meeting the needs of humanity, both now and in the future, and doing so without sacrificing the most deprived. This, invariably, necessitates a change of current practices and techniques in order to use, protect and share our planet's limited natural resources in a sustainable manner.

Our vision is that our economy shall in the future:

1) Grow sustainably and for the long term

Economic growth will be achieved and wealth will be generated, while emissions and other environmental impacts are reduced. Opportunities for green growth will be facilitated – including in a growing low-carbon and environmental goods and services sector.

2) Use natural resources efficiently and effectively

Measures towards effective demand management and efficient use of energy and other resources will be resorted to in our households, offices and businesses across the economy. Thus, inputs of materials to production processes should be optimised, reducing the level of waste to landfill. New process and products will be required, creating new market opportunities.

3) Exploit comparative advantages

Maltese businesses will be well placed to take advantage of the emerging markets for greener goods and services.

4) Be more resilient

The economy will become more resilient through more effective resource utilisation, with a view to: lower economic costs; release scarce resources; provide avenues for diversification; enhance flexibility; and generally be better prepared for the implications of climate change and environmental risks.

5) Provide quality rewarding jobs for our people

Green economic concepts and thinking will become enshrined as a natural occurrence, transcending everyday life decisions and becoming one of the underpinning characteristics of Maltese businesses, the related labour market, and the educational system that will support it.

6) Embrace all social sectors

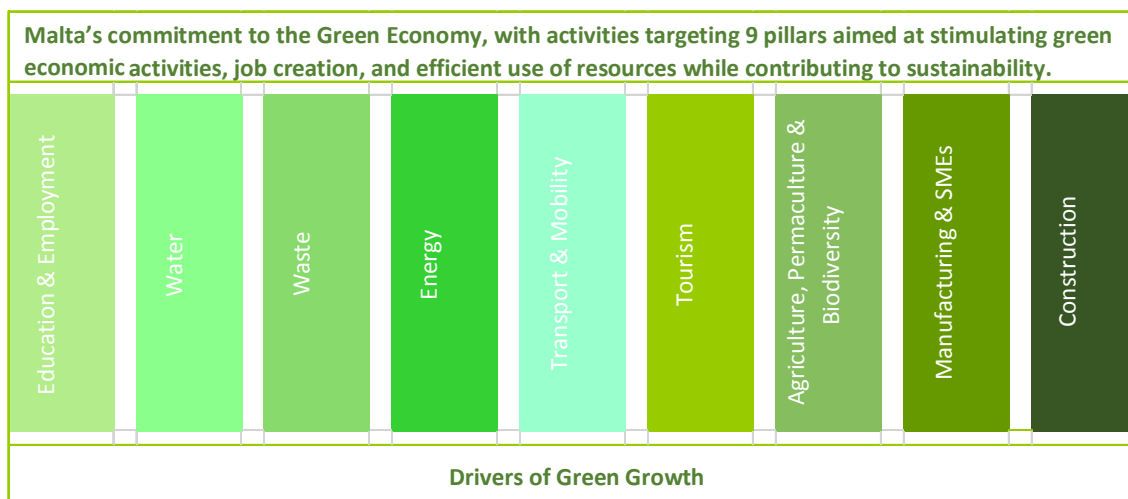
Natural and ecological capital shall become a seamless part of our economic fabric and accessible to all social sectors.

1.6 Pillars & Activities

In identifying the target areas, particular consideration was given to existing obligations and commitments that emanate from the European Union and related national targets.

This document incorporates 53 initiatives spread across a total of nine (9) pillars (or sectors) that are considered a priority, and when these are effectively executed, they will lead to green-led economic growth.

The sectoral pillars of the Green Economy strategy have been identified on the basis of the State of the Environment Report²⁸, which highlights the following economic sectors as major drivers of environmental change: housing (including construction and minerals extraction), energy, agriculture, tourism, transport and industry.



Sectorial and themed initiatives

Pillar	Number of Actions	The initiatives do not revoke, compete or substitute the measures envisaged in Malta's national plans
1. Water	5	
2. Resources:		
o Waste	5	
o Energy	4	
3. Transport & mobility	9	
4. Tourism	5	
5. Agriculture & Biodiversity	10	
6. Production, Manufacturing & SMEs	5	
7. Construction	7	
8. Education & Employment	3	
Total	53	

²⁸ MEPA 2010

2. HORIZONTAL THEMES

2.1 Green Jobs

Moving towards a green(er) Economy drives the creation of Green Jobs. Several definitions and interpretations of green jobs exist with ILO/UNEP²⁹ et al, 2008 broadly defining a **green job as any decent job that contributes to preserving or restoring the quality of the environment whether it is in agriculture, industry, services or administration.**

Specifically, but not exclusively, this includes jobs that help to protect ecosystems and biodiversity; reduce energy, materials, and water consumption through high-efficiency strategies; decarbonise the economy; and minimise or altogether avoid generation of all forms of waste and pollution. In this document:

<p>As proposed by Greenskills Inc., the simplest definition of a green job may be one which:</p> <ul style="list-style-type: none">• Reduces the adverse impact made on the environment relative to the status quo³⁰; and/or• Embraces any new job in a sector which has a lower than average environmental footprint, contributing to improving overall performance, albeit perhaps only marginally³¹.	<p>"Greening" of occupations is the extent to which green economy activities and technologies increase the demand for existing occupations, shape the work and worker requirements needed for occupational performance, or generate unique work and worker requirement</p> <ul style="list-style-type: none">• Green increased demand occupations• Green enhanced skills occupations• Green new and emerging occupations³²
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Green growth poses both a challenge and an opportunity for the labour market.

Human resources and skills are key factors for enabling green growth. The transition to a greener economy will lead to fundamental transformations across the entire economy and across a wide range of sectors. Additional employment will be created, some jobs will be replaced and others redefined. In light of this, labour market policies and coordination

²⁹ ILO= International Labour Office

UNEP=United Nations Environment Programme

³⁰ Sustainability. ISSN 2071-1050. www.mdpi.com/journal/sustainability. Article: Green Jobs in Australia: A Status Report. Ian Thomas, Orana Sandri and Kathryn Hegarty *

³¹ Employment potential of the green economy. Marco Torregrossa

³² ILO. Definitions of green jobs used in the employment and environment policy context. http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/presentation/wcms_195740.pdf

are critical to generate the necessary environment to support green employment, bridge skill mismatches and labour shortages.

As for the growing importance of green jobs, Eurostat indicates that employment in the environmental goods and services sector (commonly known as ‘green jobs’) in the EU increased by 40% to 4.3 million full-time equivalents by the end of 2012 (from 3 million in 2003). The same report indicates that the main driving force for the estimated increase *“is the growing importance of activities that manage energy resources, in particular the production of energy from renewable sources, the production of wind and solar power stations and equipment and installations for heat and energy savings”³³*.

2.1.1 Local Perspective

To date there is little data available with respect to green jobs locally (as statistics that are currently produced do not allow for the identification and measurement of this sector³⁴).

An initial study was conducted in 2007 by the Employment and Training Corporation (ETC) which analysed employment figures in a restricted manner, namely in the *environmental goods and services industry*. The study concluded that this sector employs around 3% of the labour force and contributes around 2% to Gross Domestic Product (GDP).

Excerpts of Results of the ETC survey (2007)

- 465 estimated vacancies in the environment industry.
- There was a population estimate of 4,152 in the environment industry in terms of employment;
- There is an estimated annual growth rate of 6% p.a. from 2007 till 2010.
- The size of the environment industry in terms of turnover was estimated at € 191 M with a value added at factor cost of € 91 M.

In view of the importance of having relevant data pertaining to the topic in question, Government is in the process of updating this survey and putting in place the necessary measures to quantify the measures proposed in this document in the future.

³³ http://ec.europa.eu/eurostat/statistics-explained/index.php/Environmental_goods_and_services_sector

³⁴ To this end, national data pertaining to green jobs have been specifically commissioned, with the latest data available (and referenced in this report) relating to a study that was specifically commissioned by MSDEC as part of the process for drawing up the Green Economy strategy and action plan.

In February 2015, the National Statistics Office (NSO) undertook a study³⁵ to identify the number and type of green jobs in Malta. The intent was to estimate the current composition of industries, employers and employment in green jobs across Malta and to forecast changes in green jobs based on employers' three-year projections. This NSO survey builds upon the aforementioned 2007 ETC green jobs research study (Annex 3 illustrates the NSO classification of green jobs by N.A.C.E codes categories) and indicates that, though modest in size, the green economy is picking up and is employing more workers among the various industries. A review of the survey results indicate that the majority of the green economy jobs reside in mature segments that cover a wide array of activities including manufacturing and the provision of public services such as wastewater and solid waste management, with a smaller portion encompassing newer segments that respond to energy-related challenges. These include solar photovoltaic (PV), micro wind and bio fuel industries.

The main results emanating from the NSO survey³⁶ are:

1. Green jobs in Malta amount to 2,121. The data also indicates that 72% of total employment within these industries relate purely to the green job activity, with the strongest sectors being the Water Supply industry (47%) and the Solid Waste Management services (32.5%). This representation is depicted in the table below.
2. Female employees account for 12% of the total employment within the industry with the remaining 88% being males. Furthermore females are more likely to have clerical/managerial or professional posts than their male counterparts (half of the females work in a clerical post, with 33% employed in managerial/professional/technical occupations as opposed to 4% clerical and 14% managerial/professional/technical occupations among the male segment).
3. There is a possibility of 19% green jobs growth over the next three years.
4. There is a balance between the private business (44%) and the household sector (40%). The remaining 16% of environmental services is absorbed by the public sector.
5. The survey shows that the following categories are the most prominent economic sectors in Malta which are promoting the environmental activity, namely:
 - Water collection, treatment and supply (NACE 36);

³⁵ This study was specifically commissioned by MSDEC as part of the process for drawing up the Green Economy strategy and action plan.

³⁶ Green Employment in Malta – National Statistics Office, February 2015

- Waste collection, treatment and disposal activities; materials recovery (NACE 38);
- Specialised construction activities (NACE 43);
- Wholesale trade, except of motor vehicles and motorcycles (NACE 46);
- Architectural and engineering activities; technical testing and analysis (NACE 71);
- Services to buildings and landscape activities (NACE 81);
- Public administration and defence; compulsory social security (NACE 84).

6. The estimated population vacancies extracted from the pilot survey indicates that at the end of 2014 there were about 415 unfilled vacancies.

NSO – Employment by Principal Green Activity

Environmental Activities	Total Employment		Green Jobs	
	Males	Females	Males	Females
Air pollution control	1	0	1	0
Waste water management	14	2	11	0
Solid waste management	676	52	644	47
Remediation and clean-up of soil and ground water	4	0	4	0
Noise and vibration control	2	0	2	0
Studies, Consultancy & Monitoring	25	24	22	16
Regulatory	288	194	44	46
Water supply	964	157	906	91
Recycled materials	173	41	162	38
Nature protection	29	7	9	1
Renewable energy	268	27	70	7
Total	2444	504	1875	246

Data to be interpreted with caution

NSO is currently in the process of undertaking the second part of the study that will include, among others an analysis of employment value added.

The importance placed on attaining data pertaining to the green economy and green jobs is congruent with Government's commitment to seeing the environment industry and resulting job opportunities grow further, as reflected in the National Employment Policy that calls for:

- The creation of green jobs by 6% annually until 2015;
- "... ongoing discussions and cooperation between the public and private sector of Malta to establish the right framework both in terms of infrastructure and skills";
- Better matching between training programmes at tertiary level, including in technical courses, and skills required;
- Encouragement of business start-ups in the environmental field through initiatives such as ensuring that green industries continue to qualify for space in business incubators; and

To ensure effectiveness, specific sectors of relevance are to be calculated periodically (ideally every three years), widely circulating the results. This is deemed opportune to ensure that, green growth is not only considered but indeed incorporated in national public policies and given its due importance by the various Ministries and subsequently transcends to all stakeholders – be they businesses, unions, NGOs, and indeed every Maltese citizen.

2.1.2 Action areas for consideration

- Carrying out of a workforce survey and a gap analysis so as to take stock of the exact manpower skills available in the public service. This will enable Government to deploy its present and future resources more efficiently into productive activities.
- Skills Needs

Many people working in traditional sectors have the potential to cross the bridge into environmental goods and services industries without having to undertake wholly new qualifications — for example plumbers, electricians and construction workers.

However, there is still a challenge for the education and training system to respond rapidly to ensure that individuals seeking to up-skill have access to courses which are tailored to meet emerging industry needs. New skills requirements are also being driven by new building regulations and emissions

targets that require dedicated specialists; examples include carbon auditing and management, protection of intellectual property assets from new energy technologies, building energy efficiency, project management and risk analysis. Development of relevant expertise in key engineering disciplines such as computing, electronics, environmental, electrical and mechanical engineering are also required.

Opportunities for continuous professional development for employees are essential to ensure that emerging skills requirements or shortages are met swiftly. This can be done through part-time courses, internal training in companies, or self-learning.

2.2 Education

It is necessary to change locals' thoughts, attitudes and behaviours in favour of going green. In this regard, a fundamental lever towards such change rests on education and ensuring that locals have a clear understanding and grasp of the stakes, principles and values of the pillars of sustainable development; namely to protect and enhance: the environment; economic development, culture and social progress; and the responsibility towards current and future generations. This will enable everyone to pay more attention to their surroundings.

From a business perspective, the growing low carbon industry can only flourish if employees have the right skills to meet the demands that businesses will face. Thinking green could and indeed should become part of how business is done. For example, every financial officer knowing their savings and liabilities from going green, workers in the construction sector having the right skills to build and install small-scale renewable energy technologies, and to install the full range of measures that will make homes and businesses more energy efficient in both new and existing buildings. They will need to know how to build new low carbon infrastructure such as that required to make renewable energy.

While such change will inevitably come at a cost, these will be by far outweighed by the costs (consequences) if one does not act and face the expense of adopting and coping with dangerous climate change.

Apart from the employee at large, it is equally important/fundamental to train public and private decision makers in the challenges of sustainable development. Raising the awareness of and training decision makers (national and local elected representatives, business leaders and unions among others) is deemed highly opportune to trigger real changes in behaviours and individual and collective choices.

Equal access for all to education, training and culture is a major factor in social cohesion, at all training levels and in all stages of life. It offers human beings the means to fulfil their personal and professional potential, to integrate socially and take part in the knowledge society promoted by the European Sustainable Development Strategy and Europe 2020.

National Sustainable Development Strategy (2010 -2013) – Towards a Green and Fair Economy. Republic Française

In its strategy for a green and fair economy, the French government indicates that priority skills and qualifications have been identified in six key sustainable development sectors: building, energy, agriculture, marine sciences, economy and health. Training courses capable of implementing the changes sought in these sectors must be adapted and developed quickly³⁷.

This implies extra efforts by those involved in vocational training to make the transitions smooth and support all sectors of activity, especially industrial, in adapting to the challenges of sustainable development. This goal requires a sustained training effort of teachers and instructors in all areas affected by these transformations.

Malta's continued economic growth depends on upgrading and deepening the education, knowledge and skills of Maltese workers. Human capital is a key factor in the adoption of new technologies, the introduction of innovative practices and in securing growth in multi-factor productivity arising from improvements in managerial practices, organisational change and inventions per se.

Education and training must establish stronger links with Malta's labour market given that quality intelligence on labour supply and demand dynamics are critical in ensuring outcomes that address the needs of current and future labour markets.

The Malta Chamber of Commerce Enterprise and Industry. Economic Vision for Malta 2014 – 2020)

³⁷ National Sustainable Development Strategy (2010 -2013) – Towards a Green and Fair Economy. Republic Française

Locally, the University of Malta and MCAST are now offering programmes relating to sustainable development. The University of Malta offers Masters in Education for Sustainable Development, B.Sc. (Hons) in Earth Systems, Master of Science in Sustainable Environmental Resources Management, Master in Environmental Management and Planning, Master of Science in Sustainable Infrastructure, Masters in Sustainable Energy. On the other hand, MCAST offers courses on Environmental Sustainability, Environment Conservation, Environment and Water Technology, Environmental Engineering, Energy Management, Power Generation, Solar Thermal Installations Power Generation and Renewables among others.

Save and Reduce: Eco Gozo Home Consultancy Visits

The Eco Gozo Directorate within the Ministry for Gozo in a joint venture with the Institute for Sustainable Energy within the University of Malta has recently concluded a project that focused specifically all households (in Gozo) with the aim of informing the Gozitan community on how to reduce the carbon footprint of the household water consumption as well as encourage appropriate waste management practices.

Trainers who conducted these visits have been trained to consult families on Energy Conservation, Water Conservation, Renewable Energy and Waste Separation, and discussed on a one-to-one basis the particular scenarios of each individual family.

An information booklet, containing qualitative and quantitative information on EcoGozo's main objectives, tips on energy and water conservation together with renewable energy technologies and better waste management, was also distributed to all the Gozitan families during these visits.

This project is unique because it thrives on the proximity of a small island like Gozo by supplying personal attention to the needs of each family.

2.2.1 Action Areas for consideration

- Infuse education for sustainable development in other cross-disciplinary education like education in health, nutrition and risk management.
- Ensure that issues and actions related to sustainable development are exploited from different perspectives.
- Match the professional training available in key sectors to the new requirements of sustainable development.
- Incorporate sustainable development in all vocational training.
- Develop stronger industry-academic links

There is opportunity for an industry-academic partnership in which industry plays an important role throughout the whole education process. There are a number of

ways that stronger industry-academic links can help meet the skills needs of the sector that comprise and are not limited to:

- Education providers should continue to involve industry in the development of course curricula to ensure relevance of skills to employers. There is scope for more structured engagement between providers and industry, particularly as the industry becomes more involved in green issues.
- Re-design existing, and introduce new, accredited courses (and/or modules) to meet new and emerging skills needs of enterprise operating in the green economy.
- Provide continuing professional development, full-time / part-time and distance opportunities for professionals to update existing knowledge and acquire new skills.

Be that as it may, the underpinning of a knowledge-based economy is the availability of relevant talent.

Investment in higher and further education is essential to provide individuals with the competencies and skills that will enable them to find employment.

The Malta Chamber of Commerce Enterprise and Industry. Economic Vision for Malta 2014 – 2020)

2.2.2 Upcoming Endeavours

Government has continued to direct its efforts towards addressing skills gaps and raising educational levels that include:

- The recent inclusion of sustainable development in school curricula, and the training of teachers and managing staff with respect to such inclusion so as to assist in the implementation of the overall sustainable development approach of schools and establishments;
- The University: with specific courses aimed at targeting sustainable development, such as:
 - Masters in Education for Sustainable Development;
 - B.Sc (Hons) in Earth Systems³⁸
 - Master of Science in Sustainable Environmental Resources Management
 - Master in Environmental Management and Planning
 - Master of Science in Sustainable Infrastructure

³⁸ The Bachelor of Science (Honours) in Earth Systems focuses on the various systems operating on Planet Earth, their dynamics, and the implications for humans. The course looks at the different physical components of the planet and interactions between these, whilst framing issues of environmental change within the wider context of environmental, social, economic and cultural sustainability.

- Masters in Sustainable energy

2.4 Proposed Actions

1. Sustainable development education strategy

Integrate sustainable development into education by:

- By year end 2016: Include sustainability among the priority areas for future Malta Government Scholarship Schemes.

In line with the above it is equally imperative to promote/ encourage students to follow careers in the green field

- By year end 2016: Develop a National Education for Sustainable Development Strategy (NESDS) to ensure that education for sustainable development provision reaches every sector of the local population (formal, non-formal and informally).
- By year end 2017: Mainstreaming 'sustainability' in different training programmes, ensuring that in both training courses which offer specialised training related to the green economy, as well as in other training courses which focus on the development of transversal skills, participants appreciate and understand the role of the green economy in today's economical and employment architecture. (It is therefore necessary that this measure ropes in with the National Education for Sustainable Development Strategy group that was recently set up).
- By year end 2018: Develop focused training programmes through the University of Malta and/or MCAST aimed at developing the new skill requirements that are required to further the green economy with particular reference to the sustainable development and the development (& inspection) of green buildings. This will require:
 - a thorough review of the skills already available on the market;
 - mapping of the skills that are going to be required in the future; and
 - a stronger emphasis on sustainable development and green economics in the educational process particularly through the concept of green economic growth within the national curriculum and across academic courses offered by University as well as post-secondary schools in particular in the area of business, engineering, architecture and design.

2. Education for Households

This measure is to tie in with the Awareness Measure highlighted under the Water pillar

pertaining to households and their energy/water consumption.

- By year end 2017: Develop an outreach programme for households and businesses whereby a sustainability mentor (comprising green energy) would be allocated to provide recommendations on how households could become more sustainable. This would ensure that the economic benefits of going green can be reaped by everyone including the socially disadvantaged and micro enterprise that may not have the resources to invest in greening programmes³⁹.

3. One-Stop-Shops

- By year end 2017: Create one-stop-shop offices through the Local Council network and/or Social Service area Offices for Government services. This increases the level of public outreach and in this way promotes efficiency but also serves to cut down on traffic/transport as individuals are served within the community within which they reside and in this way diverts and reduces traffic away from Valletta.

³⁹ Such Action would build upon the experience gained from a similar project that was run in relation to Eco-Gozo.

3. RESOURCES

3.1 Water

As a vital but rather scarce resource on the Maltese Islands, the efficient management (and use) of the islands' water supply is essential⁴⁰. Nonetheless, the population at large seems oblivious to such threat. Such a stance is possibly the result of households having plenty of water whenever they turn on the tap.

Indeed, people tend to underestimate or ignore the environmental and financial impact of this important resource in everyday life; be it when taking a shower, using a flush toilet, washing clothes or making a cup of tea/coffee; with heating water being identified (internationally) as the second largest source of energy use in the home⁴¹ (second only to heating one's home).

Embedding water efficiency in peoples' hearts and minds will become more and more important, though reducing water consumption does not necessarily imply placing an uncomfortable burden onto households. A primary step incorporates awareness of the impact of one's decisions together with some minor, simple changes to current *modus operandi*. The simplest actions could result in considerable savings, be it taking just one minute off when showering every day and/or washing clothes at 30°C as opposed to hot water.

Malta's groundwater reserves are under stress from both a quantitative and qualitative (nitrate and salinity) perspective. Groundwater resources supply around 40% of the municipal water produced and distributed by Water Services Corporation (WSC). Furthermore, the aquifer systems support a wide range of economic, social and environmental activities, important for sustaining a high standard of living in the Maltese islands.

In this regard, The Malta Chamber of Commerce, Enterprise and Industry too expressed concern with regard to the management of water production, well aware that should the sustainability of the water table collapse the consequences to business and enterprise (and the rest of society) would be dire: increased dependency on Reverse Osmosis water production (and consequent dependency on electricity for such production) with the subsequent negative impacts arising from increases in the water tariffs⁴².

⁴⁰ The Malta Environment and Planning Authority – The Sustainable management of Water.
<https://www.mepa.org.mt/outlook-article7>

⁴¹ <http://energy.gov/energysaver/articles/tips-water-heating> and At Home with Water. The biggest ever review of domestic water use in Great Britain. Energy Saving Trust.

⁴² Economic Vision for Malta 2014 – 2020. Malta Chamber of Commerce, Enterprise and Industry.

3.1.1 Local Perspective

Malta's policy objective is to achieve the integrated management of water resources to ensure a sustainable use of water, and that the qualitative status of water meets EU standards. These objectives will be achieved through:

- Conservation measures (both related to production and consumption),
- Water-pricing policies that provide adequate incentives for users to use water resources efficiently in accordance with the Water Framework Directive,
- The use of alternatives to groundwater, and enforcement.

The following are some key facts about Malta's water situation:

- The climate of the Maltese islands is typically semi-arid Mediterranean, with a high inter- and intra- annual variability in rainfall. The mean annual rainfall is of the order of 550mm;
- The population density of the islands exceeds 1,200 inhabitants/km², and is by far the highest in the European Union;
- As a consequence of the low water availability and the high population density the annual naturally renewable freshwater availability stands at around 120m³/person; far below the 500m³/person which the UN defines as the threshold of absolute water scarcity;
- The water demand of the islands' population and their economic activities exceeds the water resource availability by a significant margin. The deficit between demand and supply has been sustained by over abstraction from the islands' aquifer systems – an unsustainable practice. This situation is leading to the intrusion of saline waters to these aquifer systems; and
- The quality of the aquifer systems is also compromised by other anthropogenic activities such as agriculture, which are resulting in the leaching of nitrates into the groundwater systems. All the main bodies of groundwater in the islands exhibit nitrate levels exceeding the EU's 50mg/l threshold.

MEDIWAT. Strategic master Plans for Small and Large Med Islands. Sustainable Management of Environmental issues related to Water Stress in Mediterranean Islands. Edited by Maria Teresa NOTO, Teodoro VEGA, Antonio LOPEZ, Francesco VIOLA. April 2013

The Alter Aqua - Non Conventional Water Resources Programme (NCWR)

This Programme is a multi-stakeholder initiative comprising: The Global Water Partnership - Mediterranean, the Ministry for Energy and Health, the Ministry for Gozo and the Eco-Gozo Project, as well as The Coca-Cola Foundation and The General Soft Drinks Co. Ltd; aimed at mobilising Non-Conventional Water Resources (NCWR) to increase water availability in a sustainable, cost-effective way and promote a new water culture, at both a local and a national level.

The Programme's activities include the installation and reinstatement of NCWR systems (rainwater harvesting, storm water management and greywater reuse systems) in selected public buildings and areas, educational hands-on activities for school students, teacher training seminars, capacity-building workshops for local authorities, trainings for local technicians, as well as awareness raising on NCWR and sustainable water use among the general public.

The first phase of this project focused on the island of Gozo whereby a total of 4 rainwater harvesting systems were installed in schools in Kercem, Sannat, Zebbug and Gharb; 6 rainwater harvesting systems were reinstated in schools in Sannat, Xaghra, San Lawrenz and the Gozo Experimental Farm; a grey water reuse system was installed at the Gozo Football Stadium and a storm water management application was implemented in Ramla Valley, where rubble walls were constructed along the valley for storm water retention aimed at increased rainwater capacity for irrigation purposes in agriculture, as well as aquifer recharge.

Moreover, approximately 3,200 students were educated about sustainable water management and consumption, 255 teachers were trained and a STENCIL Award was given to the school programme for the best science-related innovative education material in Malta and in Europe. Furthermore, 48 technicians were trained, 18 stakeholders participated in the capacity-building workshops, while it is estimated that there have been a total of 30,000 beneficiaries from the NCWR systems and awareness-raising activities.

The Government is currently in the process of drawing up a national water management plan – a strategic approach to tackle the water issues faced locally. Such plan is anticipated to be completed by the third quarter of this year at the latest. Such plan is to provide strategic direction with regard to this invaluable resource through identification of sustainable use of all available water resources and achieving high levels of efficient water use in all water using sectors.

3.1.2 Action Areas for consideration

The main action areas for consideration concerning water are:

- Reducing the abstraction of groundwater to within sustainable levels;
- Improving the energy efficiency of desalination systems;
- Optimising the national rainwater harvesting capacity;
- Optimising the production capacity of New Water Resources;
- Increasing awareness about this valuable resource among at municipal level.

Two particular sectors of the national economy namely Agriculture and Commercial/Tourism are considered heavy users of this resource and necessitate specific action in this area.

The management of freshwater resources may include measures and/or projects related to:	
Agriculture: <ul style="list-style-type: none">• Optimisation of the sector's rainwater harvesting capacity;• More efficient use of water through increased adoption of high-tech irrigation systems;• Development of sources of 2nd class water resources, such as highly polished treated effluents;• Establishment of dedicated distribution networks for 2nd class water;• Identification and adoption of climatologically adapted crops; and• Water consumption audits benchmarking actual water use with efficiency levels.	Tourism/Commercial industry: <p>Increased uptake of the following:</p> <ul style="list-style-type: none">• Eco-certification to benchmark water consumption reduction;• Utilisation of harvested rainwater;• Adoption of water efficient gadgets and appliances to reduce water consumption; and• Integration of grey-water recycling systems for the production of 2nd class water.

3.1.3 Upcoming endeavours relating to water resource efficiency

New Water Resources

- To enable the utilisation of New Water Resources by the agricultural and industrial sectors, polishing facilities to produce this water are currently being developed within Malta's three waste-water treatment plants (primarily through EU funding). The planned polishing capacity stands at 7 million m³ per annum.

- To develop a dedicated distribution network for New Water Resources (through EU funding) to enable the availability of this water at the point of use and therefore supporting its utilization by the agricultural and industrial sectors.
- The protection of the resource value of this water through the effective regulation of discharges to the public sewer is an important factor to ensure the reliability of this new water supply.
- Studies on the impact of New Water Resources irrigation and the quality of agricultural produce especially on cauliflower crop are currently being undertaken.

Wastewater

- A continuous upgrading and maintenance programme of the wastewater network - to reduce infiltrations of saline water and therefore reduce the level of treatment required for the achievement of use standards.
- Establish the administrative capacity required to effectively regulate discharges to the sewer network - to protect the resource value of treated/polished effluents;

Water demand map

- Scoping report with respect to the development of a water demand map to identify the spatial variability of water demand in quantitative and qualitative terms to enable the conjunctive utilization of water resources to address the demand.

National Water Management Plan

- Government is currently in the process of drawing up a national water management plan – a strategic approach to tackle the water issues faced locally.

The here below identified proposals will need to be re-examined once the National Water Management Plan is finalised to better assess to what extent these have been incorporated into the said document and subsequently determine/alter time lines for action.

3.2 Waste

The European Union's approach to waste management is based on the "waste hierarchy" which sets the following priority order when shaping waste policy and managing waste at the operational level: prevention, (preparing for) reuse, recycling, recovery and, as the least preferred option, disposal (which includes landfilling and incineration without energy recovery).

Waste Hierarchy



In line with the above, the 7th Environment Action Programme sets the following priority objectives for waste policy in the EU:

- To reduce the amount of waste generated;
- To maximise recycling and re-use;
- To limit incineration to non-recyclable materials;
- To phase out landfilling to non-recyclable and non-recoverable waste;
- To ensure full implementation of the waste policy targets in all Member States.

In this respect the EU is confident that compliance with environmental regulations and public demand for more environmentally sustainable solutions for waste will provide the key stimulus for growth in the sector.

Circular Economy



Apart from improved efficiency, enhanced waste management also helps to reduce health and environmental problems, reduce greenhouse gas emissions (directly by cutting emissions from landfills and indirectly by recycling materials which would otherwise be extracted and processed), and avoid negative impacts at local level such as landscape deterioration due to landfilling, local water and air pollution, as well as littering.

3.2.1 Local perspective

Malta has for long relied on disposal as the main waste treatment operation, depending heavily on landfilling, though its level of material recovery is low. Nevertheless, in recent years Malta has made improvements in the waste management field, notably in terms of upgrading waste infrastructure, the setting up of waste separation and recycling systems, as well as educational programmes; including educational programmes in schools.

In line with the waste hierarchy for sustainable waste management (Box on page 29) the Government is seeking to minimise waste production and ensure sustainable management of eventual waste generated, and in line with the circular economy concept (BOX on page 30) follow the rigorous application of the re-use, recycling and recovery concept. This move however, depends on a variety of factors mainly:

- Population habits,
- Waste volumes,
- Waste collection practices,
- Waste infrastructure and
- Output markets.

Moreover, Malta's high population density, limited land space and lack of economies of scale coupled with the effects of its climatic conditions, proves challenging to transform this small island state into a competitive player within the waste sector.

Government needs to ensure that the four pillars of sustainable development (environmental, social, and economic and cultural aspects) are taken into consideration in decision-making in the waste sector in order to manage waste in an environmentally sustainable manner, in line with the implementation of the EU waste directives that are based on four principles, namely:

1. Reduce waste and to prevent waste occurring, with a view to achieving a zero-waste society by 2050;
2. Manage waste in accordance with the waste hierarchy, whereby it is recognised that waste should be prevented or reduced, and that what is generated should be recovered by means of re-use, recycling or other recovery options, in order to reduce waste going to landfill, and to use the collection system to aid with achieving these goals;
3. Cause the least possible environmental impacts in the management of waste; and
4. Ensure that the polluter-pays principle is incorporated in all waste management procedures.

Treatment facilities clearly illustrate Malta's initial efforts towards the achievement of sustainable waste management. However, despite encouraging developments much more is yet to be done especially to:

- Move away from excessive landfilling;
- Enhance separation and recycling rate;
- Shift from unsustainable dumpsites towards differentiated waste collection.

To this end, in January 2014, Malta issued the Waste Management Plan 2014-2020 guided by EU waste policy that seeks to: move towards a recycling society; avoid the creation of waste; and use waste as a resource. Furthermore, at a local level it is recognised that targets pertaining to reducing the generation of waste and to increase separation of waste at source ought to be established and subsequently met in order to promote recycling and reduce landfilling.

Although relevant to the greening of the economy, of equal or possibly greater relevance is the concept of using waste as a resource with Government leading the way in shifting its thinking towards accepting waste as a valuable re-usable resource, the harnessing of which can help better distribute the benefits of the green economy to those sectors of the population that are less advantaged.

The *Waste Management Plan 2014-2020* obliges Malta to reach the following targets:

- Recycle 50% of paper, plastics, metal and glass waste from households by 2020;
- Only 35% (based on 2002 levels) of biodegradable municipal waste will be allowed to landfill by 2020;
- Recover 70% of Construction and Demolition (C&D) waste by 2020;
- Collection of 65% of the average weight of electrical and electronic equipment placed on the national markets by 2021;
- For electrical and electronic equipment placed on the national markets achieve 55%, 70%, 80% and 85% re-use and recycling 75%, 80% and 85% recovery by 2018;
- Collection rates for waste portable batteries to reach 45% by 2016;
- To re-use and recover 95% of an average weight per vehicle per year by 2014.

3.2.2 Action Areas for Consideration

- Prioritise efforts to manage waste in line with the waste hierarchy and reduce the carbon impact of waste;
- Develop a comprehensive Waste Prevention Programme and work with businesses and other organisations across supply chains on a range of measures designed to drive waste reduction and re-use as part of a broader resource efficiency programme
- Develop voluntary approaches to cutting waste, increase recycling, and improve the overall quality of recycle material, working closely with business sectors and the waste and material resources industry;
- Support businesses, local authorities and third sector organisations to help reduce avoidable food waste – in the home, in supply chains, across the public sector and within businesses themselves;
- Support initiatives which reward and recognise people who do the right thing to reduce, reuse and recycle their waste;
- Work with councils to increase the frequency and quality of rubbish collections and make it easier to recycle
- Linked to this objective is also the case for Gozo⁴³ and could comprise the collection of waste from retail establishments (particularly from localities with minimal outlets present). Indeed Gozo could be used as a pilot project to determine whether the collection of waste from retail outlets within small localities could fall under the remit of the local council concerned. Such a stance could possibly facilitate communication and cooperation between outlets and the councils concerned and also facilitate separation of waste from such entities.

⁴³ In view of its distinct characteristics/size

3.2.3 Upcoming Endeavours

In its strive to reduce waste, the Electoral Office is in the process of adopting an e-Counting process and the use of the eID card for the election period. Such activities are in line with the priority objectives for the waste policy within the EU, as set out in the 7th Environment Action Programme.

Waste and waste management affects, and is likewise affected by all industries be it tourism, agriculture, and construction among others. Such a stance further emphasizes its importance. Indeed, although this document focuses particularly on waste in this Chapter, it is imperative that waste (and waste management) is not treated in isolation, but is in fact incorporated within all industries.

3.3 Soil

Soil is one of Malta's most important natural resources, with socio-economic and ecological significance. Malta's soil resources are imperative for the maintenance of ecosystems health, agriculture and water management, as well as supporting tourism and recreation-related activities in the countryside. However, soils are continuously being threatened by the loss of organic matter and related biodiversity impacts, as well as contamination, soil sealing and erosion. The loss of natural spaces due to urban sprawl is also further threatening this valuable resource.

National legislation for the prevention of loss of soil and obligatory maintenance of soil-retaining structures already provides a framework under which further soil protection measures may be put in place. The National Environment Policy has sought to strengthen and complement the current legal framework through a number of soil-related measures.

Furthermore, the emerging soil monitoring strategy will seek to address lacunae related to the continued collection and evaluation of local soil-related information and pre-agreed theme-based indicators.

3.4 Minerals

The local building stone - limestone - is an important mineral natural resource. It is central to Malta's built environment, contributing to its urban character and thereby national identity. Malta's strategy for achieving the efficient use of limestone rests on the following six actions⁴⁴:

1. Improving information about minerals extraction.

⁴⁴ Malta's National Reform Programme under the Europe 2020 Strategy. April 2013 (page 153)

2. An assessment on the best method for internalising environmental costs into the price of the resource.
3. Research into cost-effective methods for reconstituting stone blocks from smaller material will be undertaken.
4. Regulation of minerals extraction operations and other related operations will be carried out through environmental permitting, as well as enforcement and remedial action.
5. Quarry operations will be required to excavate and restore parts of their quarries in phases, and to reuse or recycle overspill material prior to further excavation.
6. A policy framework for the minerals extraction sector will be developed.

3.5 Proposed Actions

Water

4. 'Initiate the implementation of the National Water Management Plan

The National Water Management Plan is envisaged to be finalised by the end of 2015.

- By year end 2016: Act on the implementation of the National Water Management Plan. In line with the above, it is fundamental that the right systems are in place to regularly monitor its progress and take action as necessary to ensure its implementation. Also, the implementation phase should also comprise an evaluation process throughout the whole of the management plan duration, to determine whether pre-set targets are being met and should variances arise, opportune action is taken to rectify them.

5. Rainwater Runoff Management

Groundwater abstraction is currently estimated to exceed sustainable rates⁴⁵. This is not a sustainable situation, and the increased exploitation of alternative water resources to reduce the pressures on the aquifer systems is warranted.

The urban development experienced in Malta since the post-war years, has significantly increased the generation of rainwater runoff. This increase has come at the expense of natural recharge to groundwater, thus presenting an added strain to the islands' aquifer systems.

In order to compensate for this impact and support the sustainability of the aquifer systems the optimized management of rainwater runoff is required. Such optimization should seek to increase the national rainwater runoff harvesting capacity as well as the

⁴⁵ The Maltese code of good agriculture practice

groundwater recharge capacity through the development of artificial infiltration facilities.

The following actions are therefore being proposed, aimed at ensuring that the ecological and hydrological functions of valley systems are enhanced without being detrimental to each other. **The dates for implementation will need to be established once the National Water Management Plan is drawn:**

- Carry out a study to identify the optimisation of national rainwater harvesting infrastructure and subsequently implement such plan. This is to comprise the development of the necessary administrative capacity to ensure the effective use of harvested water;
- Carry out a study for the identification of new sites where soakaways and valley dams could be developed to increase the national recharge potential;
- Effective enforcement of existing legislation requiring the development of rainwater harvesting cisterns in domestic and commercial development;
- Establishment of an effective rehabilitation and maintenance programme for existing soakaways and dams in valleys to optimize their recharge contribution;
- Support schemes for the agricultural sector to increase its rainwater harvesting potential.

The success of this measure is dependent on a coordinated approach among various Ministries, namely: the MTI, MEH and Ministry for Gozo.

6. Better utilisation of water

Particularly for the business community there ought to be ways to determine opportune investments directed towards the effective and efficient use of this scarce resource. In this regard, such Action will build upon the experience gained in the MBB LIFE+ project 'Investing In Water' which had targeted reducing water use in the tourism sector. It is consequently being suggested that audits be carried out specifically in this respect, and, based on the audit and the results derived thereof, if deemed opportune, enterprise would subsequently be able to tap into a grant scheme to carry out the necessary amendments/alterations/investments to become more resource efficient. Such action is to compliment a similar action suggested under the Energy pillar.

- By year end 2017: Establish an audit infrastructure mechanism such that entities may request audit assistance to determine current resource utilisation (primarily water and energy) and subsequently determine ways of increasing such resource utilisation efficiency.
- By year end 2018: Draw up a scheme to assist enterprises undertake measures

focusing on 'greening' their operations through improved resource efficiency utilisation.

7. Increasing awareness

In order to increase awareness and instil a sense of responsibility among the local population at large, it is imperative to attain a clear understanding of household consumption patterns. Furthermore, it is important to engage the consumer, educate families more about water (and energy), and offer household-specific solutions for reducing bills. A new approach is thus needed to help people get control of water (and energy) use in the home.

- By year end 2016: Carry out a study to determine household's water (and energy) consumption patterns and consequently identify ways and means how such consumption could be decreased to the benefit of households and likewise the nation⁴⁶.

8. Development of the water demand map

- By year end 2018: Development of full water demand map. (The scoping report is envisaged to be completed by the end of 2015).

Waste

9. Action plan targeting animal farm waste

There is the need to draw up an action plan for animal farm waste. Such plan will need to be linked with the Rural Development Plan for Malta that is currently being drawn up and other ongoing studies relating to waste treatment as well as EU regulations and obligations.

- Mid-2017: Draw up a plan for animal farm waste, and subsequently undertake its implementation.

10. Thermal Treatment with Energy Recovery

⁴⁶ It could be opportune to follow the UK which launched 'the water energy calculator' – an online tool to help households to understand their water and energy use and identify potential savings. It indicates how progressive improvements such as dual-flush lavatories and eco-showerheads can reduce water consumption with little or no impact on the 'bathroom experience'.

The MSDEC is currently carrying out a study to determine the best technology for Malta for generating energy in the form of electricity and/or heat from waste.

- Mid-2017: Follow-up on the results derived within the framework of existing and future EU obligations with respect to: EU2020 targets, the Landfill Directive and Waste Framework Directive.

11. Construction Waste Management

The amount of waste actually generated by stone quarrying is alarming due to:

- a) The amount of stone that is discarded during quarrying owing to chipping;
 - b) Raw material not being priced at its true economical value; and
 - c) Demolish and re-development initiatives.
- By mid-2017: An effective policy mechanism will be created to identify and quantify the volume of available recyclable materials as well as to create an effective policy mechanism with which to ensure that they are effectively harnessed and made available for re-use.

This would kick-off with the setting up of a joint partnership research initiative in conjunction with the Malta University⁴⁷ together with interested business developers in the carrying out of a live research project to look into the commercial viability of using reconstituted stone as a viable alternative to natural stone thereby reducing extraction of a finite existing natural commodity whilst giving value to a waste product with:

- The Malta University providing academic knowledge and laboratory facilities;
- Government providing access to waste management sites and the material contained therein; and
- Interested private sector parties identified through an open call provide actual construction knowhow.

In addition there could be other waste material that could be incorporated in the construction industry such as waste glass.

12. The recycling, re-use and recovery of industrial waste

As clearly evidenced throughout this Chapter, in line with EU's direction towards a circular economy, and Malta's current limitations in this regard, there is the need to

⁴⁷ In this respect it is worth noting that the University of Malta has carried out research related to the topic. Furthermore this action is in line with Measure 2.3.3 and Pilot Project 3 for the NEP

determine the opportunities in the recycling, re-use and recovery of industrial waste.

- Mid-2017: Carry out a study to determine the extent to which recycling projects may be embarked upon by small enterprises and converted into viable commercial activities (taking into account the geophysical and economic realities of operations in Malta) ⁴⁸. Such a stance will invariably necessitate an analysis of the current waste generated locally.

13. Recovery and re-use of 'avoidable'⁴⁹ food waste

This action seeks to continue from the work carried out by the Food Waste Working Group

- By year end 2017: Carry out a research and assessment exercise to determine the amount of waste from food & beverage suppliers (wholesalers and retailers that comprise: supermarkets, grocers, food importers/distributors etc) and draw up opportune protocols such that 'avoidance' food from such outlets may be collected and re-distributed to the most deprived and/or farms as animal feed.

Action plan/s related to the development of waste facilities are to be developed with a view to maximise use of the limited land resources that are to be dedicated to these facilities

⁴⁸ Malta Enterprise have indicated their willingness to be involved in the drafting of the terms of reference for such study.

⁴⁹ Avoidable – food and drink which is disposed of because it is no longer wanted or has been allowed to go past its best before date. The majority of avoidable food is composed of material that was, at some point prior to disposal, edible, even though a proportion is not edible at the time of disposal due to deterioration. .Food Waste Working Group. Recommendations to MSDEC – October 2014

4. ENERGY

To date the energy sector is highly carbon-intensive and depends on a finite supply of fossil fuels leading to concerns about national energy security in many countries. With global energy demand likely to grow further to meet development needs, in the context of growing populations and income levels the current situation is clearly not sustainable from an economic, social, cultural as well as environmental point of view.

Greening the energy sector will require improvements in energy efficiency and further deployment of renewable sources as well as a switch from fuel oils to cleaner fuels like natural gas and LPG. Such measures will contribute towards a reduction in greenhouse gas emissions (GHG) and other types of pollution.

The IEA definition of renewable energy:

Renewable energy is derived from natural processes that are replenished constantly. In its various forms, it derives directly or indirectly from the sun, or from heat generated deep within the earth. Included in the definition is energy generated from solar, wind, biomass, geothermal, hydropower and ocean resources, and biofuels and hydrogen derived from renewable resources (IEA 2008a).

Greenhouse gas emissions are adversely affecting everybody. It is consequently fundamental that everybody plays his/her part, be it government, businesses, NGOs, communities and the locals at large. Bringing about the necessary change will result in a better quality of life, improved long-term economic health, new business opportunities in a fast-growing global sector, and, by reducing our reliance on fossil fuels, greater security of future energy supplies. Nonetheless, as long as climate change action is considered a “cost,” prospects for action are likely to be dim. A change in mind-frame is therefore required.

Renewable energy can make a major contribution to the twin challenges of responding to a growing global demand for energy services, while reducing the negative impacts associated with current production and use.

That said, the transition is not without its challenges. We will need to drive major changes along the energy chain to ensure a safe, secure and reliable supply.

For the purpose of this document, greening the energy sector is taken to mean a move towards a renewable and sustainable energy system which involves:

1. Using existing energy resources more efficiently
2. Diversifying the energy supply with a greater emphasis on renewable energy;
3. Reducing Green House Gas emissions and pollution

In effect this means a reduction in the use of and dependency on fossil fuels, which will result in net economic benefits and enhance the security of energy supply in the long run. Reaping these benefits will however, depend to a large extent on appropriate policies to boost investments in a measure which can lead to a greening of the energy sector.

Another aspect that needs due consideration relates to a change in attitudes and lifestyles, where minor alterations could result in a positive impact on the environment (see below Box).

Measures aimed at greening the energy sector, such as energy efficiency, covers various aspects, including but not limited to, managing water resources, better transport management and improving building design. These are covered in other sections of the report. The section also assumes that certain policy decisions are taken as given.

Changing attitudes and lifestyles - Japan

With regard to changing attitudes and lifestyles, the Japanese Government promotes the annual Cool Biz energy-saving campaign for late spring and summer.

Cool Biz was started in 2005 by the then-Prime Minister Junichiro Koizumi with the aim of reducing CO2 emissions and electricity use. Cool Biz, encourages workers to dress down, ditching their suits and ties for open-necked, short-sleeved shirts. It also encourages offices to turn down air conditioners to set office temperatures at 28 degrees Celsius.

This year (2015), the campaign went one step further with Super Cool Biz, in which polo shirts and aloha shirts are being promoted as office wear.

<http://www.japantoday.com/category/national/view/cool-biz-fashion-season-begins-across-japan>

4.1 At European Union Level

The European Union's energy policies are driven by three main objectives:

1. Securing energy supplies to ensure the reliable provision of energy whenever and wherever needed
2. Ensuring that that energy providers operate in a competitive environment that ensures affordable prices for homes, businesses, and industries
3. Sustainable energy consumption, through the lowering of greenhouse gas emissions, pollution, and fossil fuel dependence

Furthermore, through its climate and energy package the EU introduced a set of binding legislation aimed at combating climate change, increasing the EU's energy security and strengthen its competitiveness. These targets, known as the "20-20-20" targets, set three key objectives for 2020:

- A 20% reduction in EU greenhouse gas emissions from 1990 levels;
- Raising the share of EU energy consumption produced from renewable resources to 20%;
- A 20% improvement in the EU's energy efficiency

Such a position is congruent with the Europe 2020 strategy for smart, sustainable and inclusive growth aimed at contributing to the creation of jobs, the generation of "green" growth and a strengthening of Europe's competitiveness. In this regard, it is estimated that meeting the 20% renewable energy target could have a net effect of creating around 417,000 additional jobs, while getting on track to achieve the 20% energy efficiency improvement in 2020 is forecast to boost net employment by some 400,000 jobs⁵⁰.

The climate and energy package comprises four pieces of complementary legislation which are intended to deliver on the 20-20-20 targets:	
Reform of the EU Emissions Trading System (EU ETS)	<p>The EU ETS is the key tool for cutting industrial greenhouse gas emissions most cost-effectively. The climate and energy package includes a comprehensive revision and strengthening of the legislation which underpins the EU ETS, the Emissions Trading Directive.</p> <p>Major changes include the introduction of a single EU-wide cap on emission allowances in place of the existing system of national caps. The cap will be cut each year so that by 2020 emissions will be 21% below the 2005 level.</p> <p>The free allocation of allowances will be progressively replaced by auctioning, starting with the power sector. The sectors and gases covered by the system will be slightly widened.</p>
National targets for non-EU ETS	<p>Under the so-called Effort Sharing Decision, Member States have taken on binding annual targets for reducing their greenhouse gas</p>

⁵⁰ http://ec.europa.eu/clima/policies/package/index_en.htm

emissions	emissions from the sectors not covered by the EU ETS, such as housing, agriculture, waste and transport (excluding aviation). Around 60% of the EU's total emissions come from sectors outside the EU ETS
National renewable energy targets	Under the Renewable Energy Directive, Member States have taken on binding national targets for raising the share of renewable energy in their energy consumption by 2020. These targets, which reflect Member States' different starting points and potential for increasing renewables production, ranging from 10% in Malta to 49% in Sweden. The national targets will enable the EU as a whole to reach its 20% renewable energy target for 2020 - more than double the 2010 level of 9.8% - as well as a 10% share of renewable energy in the transport sector. The targets will also help to cut greenhouse gas emissions and reduce the EU's dependence on imported energy.
Carbon capture and storage	This directive creates a legal framework for the environmentally safe use of carbon capture and storage technologies. Carbon capture and storage involves capturing the carbon dioxide emitted by industrial processes and storing it in underground geological formations where it does not contribute to global warming. The directive covers all CO ₂ storage in geological formations in the EU and lays down requirements which apply to the entire lifetime of storage sites.

4.2 The importance of Energy Efficiency

Using energy more efficiently has many benefits. It can help households and businesses lower their fuel bills, reduce Europe's reliance on external suppliers of oil and gas, combat climate change and make the EU's economy more sustainable and competitive.

Energy efficiency is in fact also at the heart of the European Union's Europe 2020 Strategy for smart, sustainable and inclusive growth and of the transition to a resource efficient economy. At the Spring Council 2007, EU leaders reiterated the importance of energy efficiency by stressing *"the need to increase energy efficiency in the EU so as to achieve the objective of saving 20% of the EU's energy consumption compared to projections for 2020"*⁵¹.

The importance of energy efficiency was again confirmed in the Commission's Annual Growth Strategy 2012⁵², in which it urges Member States to prioritise growth-friendly expenditure, such as education, research, innovation and energy, and to focus on

⁵¹ European Commission Directorate-General for Energy. Directorate C - Renewables, Research and Innovation, Energy Efficiency. C.3 - Energy efficiency. Brussels, February 2012 7224/1/07 REV 1

⁵² COM(2011) 815 final. Communication from the Commission, Annual Growth Survey 2012

resource efficiency, for example in areas such as energy efficiency and reducing waste, which can improve competitiveness, create new jobs and help our environment.

Moreover, Member States are invited to use the power of ICT to deliver smart energy and transport systems. For example, smart electricity grids, high levels of energy efficiency and widespread use of renewable energy are essential components of a modern, competitive economy and crucial for EU development in the coming years.

Energy efficiency for the 2020 goal

European Union leaders agreed in March 2007 to reduce the EU's projected energy consumption by 20 % by 2020. Furthermore, in October 2014 they agreed a higher energy savings* target of 27 %, or greater, by 2030.

The package contains the following measures:

- Existing legislation on energy efficiency in buildings will be extended to cover more premises. The Commission believes 30 % less energy use in the sector is feasible.
- Labelling legislation requiring details of a product's energy use will apply not just to existing household appliances, but also to commercial and industrial energy-using and related products, such as windows and motors used in buildings.
- New energy labelling legislation will be tabled to encourage the use of fuel-efficient tyres. These require less force to turn the steering wheel and so consume less fuel.
- Existing measures on the combined generation of electricity and heat (cogeneration) will be strengthened.

Subsequently, in 2011, the Commission proposed an energy efficiency plan to ensure the 20 % reduction target is met and to help move towards a resource-efficient and low-carbon economy by 2050. A year later (2012) the EU adopted a new energy efficiency directive. This laid down rules for the more efficient supply and use of energy and laid down indicative national energy efficiency targets.

<http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=URISERV:en0002>

4.3 Local Perspective

The energy sector is the largest contributor to gross national Green House Gas (GHG) emissions with latest available data (2013) - indicating that this sector accounts for 88.8% of total GHG emissions within the energy sector. The two main contributors (of the 88.8% emanating from the energy sector) are electricity generation with a share of 72.3% and transport which accounts for 21.1%⁵³.

Malta's current energy policy, set to address the country's energy challenges, is highly influenced by numerous EU energy and environment policies. The targets set by the relevant EU Directives for Malta are as follows:

- A commitment to achieve a 27% of the primary energy consumption or 264,282 toe savings target by 2020;
- Total final energy consumption of 0,547 Mtoe in 2020;
- Renewable Energy Target: 10% of final energy consumption by 2020;
- Bio-fuel contribution in the fuel mix: 10% of final energy consumption of fuels by 2020;
- Reduction in Greenhouse Gas emissions under Effort Sharing Decision: +5% over 2005 levels by 2020.

With respect to carbon dioxide emissions, Malta has initiated the process of developing a national low carbon development strategy (LCDS) in accordance with requirements under the United Nations Framework Convention on Climate Change (UNFCCC) and European Union legislation. The LCDS seeks to promote economic development while keeping greenhouses gas emission low, or lower than without interventions.

The requirement to prepare a LCDS is also inscribed as a requirement on the Maltese Government, in the Climate Action Act, that Malta has recently adopted to streamline its commitments on climate change on both main fronts of climate action, namely mitigation and adaptation in a legally binding way.

This Act aims to instil ownership across the board to fine-tune effective climate action and governance. Its guiding principles aim towards, taking into account obligations and commitments at national, EU and international fora, whilst ensuring that all sectors of the economy participate in climate action which contributes to sustainable development. The Climate Action Act inscribes the establishment of the Climate Action Board (aims to supervise the implementation of the Act and monitor Malta' fulfilment and obligations amongst others) and the Climate Action Fund (that will support the fulfilment of the Government's obligations and commitments).

⁵³ Malta's Biennial Report on Policies and Measures and Projected Greenhouse Gas Emissions. Malta Resources Authority (MRA) 2013

4.4 Action Areas for Consideration

- Reducing energy demand

One step towards going greener revolves around reducing energy consumption. Such a strategy is deemed opportune as in many instances doing so saves money for households and businesses, whilst maintaining or improving the standard of living.

Ways to decrease demand for energy include:

- Increasing energy usage efficiency (for example, by applying insulation to domestic or commercial buildings, and purchasing energy efficient appliances);
- Reducing the demand for energy-intensive services (for example, by adjusting the set-point of air conditioning units, and a lower temperature of washing machines);
- Use of passive heating/cooling and ventilation;
- Providing the necessary information to promote/encourage a behavioural change with regard to energy consumption. Changes in behaviour must be based on a better understanding of the climate, its mechanisms and its evolutions, energy consumptions and their effects.

- Pay as you save model

This is explained in further depth in Chapter 10 – Drivers of Green Growth of this report.

- Launching a new carbon challenge league with rewards and incentives for saving energy

This could be adopted at local council and/or government (departmental) level and/or schools whereby such entities will be enticed to save energy by making small changes to their current practices. Those that succeed will top the energy league table and attain some financial incentive/reward for their successful endeavours. With these incentives, staff, students and the environment will be able to see the benefits of a more efficient environment and lower carbon footprint.

- Taking impacts of greenhouse gas emissions into account

This is explained in further depth in Chapter 10 – Drivers of Green Growth of this report, when indicating 'Economic instruments such as environmental incentives and emission trade schemes' under the section, 'Alternative financial models'.

- Social Dimension Investment Aid

It is imperative that one does not disregard the social consequences of any energy policies introduced so as to avoid increasing inequalities.

International energy prices are expected to rise in the years to come, mainly as a result of incorporating external costs in the use of fossil energies and through depleting resource. This increase must not result in categories of the population being excluded from basic needs such as heating or electricity. This implies setting up investment aid in favour of energy-saving solutions or those adapting to climate change for the most deprived populations.

- Carbon Budgets

In line with Government's stand to lead by example – this measure is directed primarily at public buildings, and local councils (and could possibly include government schools too) and revolves around placing more onus on public entities and introduce (provide them with) carbon budgets, that effectively provide legally binding limits on emissions. Carbon Budgets are deemed opportune to ensure that regular progress is made towards the Government's long-term carbon emission targets, and could run over a number of years thus servicing as a stepping stone in this direction. This is a holistic approach towards instigating such entities to drive change in every area, be it the way they generate energy, the way they heat offices/buildings, and the way one travels.

- Funds for businesses

Encourage businesses, through grant schemes to undertake critical investments in Renewable Energy Sources (RES) and Energy Efficiency (EE) technologies. In this regard the Malta Chamber of Commerce, Enterprise and Industry has indicated the main issue with businesses in this respect is that *"Energy rates are a sensitive issue which directly affect the cost structures and cashflows of business operations. The situation also has serious implications on the country's competitiveness and attractiveness to new investment"*⁵⁴.

- Introduce energy vouchers to incentivise private investment in alternative sources of energy and in increased efficiency of energy. Such energy vouchers could be set against electricity bills for companies which invest in efficient and alternative energy sources⁵⁵.

In line with the above, such a scheme would assist in enticing the private sector to invest in equipment/ processes that result in increased efficiency. The initial investment is very often a deterrent for businesses to undertake more sustainable initiatives, with the voucher scheme ideal in assisting entities in this respect.

Due to the higher labour intensity of various renewable energy technologies compared with conventional power generation, increased investment in renewable energy will add to employment (especially in the short term)⁵⁶.



Source: ILO, 2011

Overall impacts on employment of investing in renewable energy, taking into account

⁵⁴ Chamber of Commerce, Enterprise and Industry (Economic Vision for Malta 2014 – 2020)

⁵⁵ Economic vision for Malta 2014 – 2020. The Malta Chamber of Commerce, Enterprise and Industry

⁵⁶ Skills and Occupational Needs in Renewable Energy (ILO, 2011),

possible effects in fossil fuel-related sectors, will vary by national context, depending on supportive policies, available resources and national energy systems.

4.5 Upcoming Endeavours

Considerable investments are being made in upgrading the energy infrastructure and in diversifying sources and supply with the aim of significantly increasing overall generation efficiency by Government to decrease greenhouse gas emissions in Malta; thus contributing to the greening of the energy sector. In this respect, the electricity interconnector came on stream in 2015 alongside the closing down of inefficient power plants. Further future efforts in this respect comprise:

- Commitment to switch Malta's electricity generation facilities from Liquid Fuel Oils to Natural Gas through the construction of a new highly efficient electricity generating plant and Liquefied Natural Gas (LNG) infrastructure;
- Determining the commercial viability of having a gas pipeline with mainland Europe as well as its effect on the Maltese economy;
- Commitment to diversify the sources of energy through specific programmes; and
- Pursuing the development of its internal electricity distribution network, both to meet increased consumer demand and to enable the connection of increased renewable energy installations and small or micro cogeneration units.

The Maltese Government is heavily stressing the importance of further promotion in the usage of Renewable Energy Sources (RES) as the way forward for the energy sector.

Other upcoming endeavours comprise:

- The more accurate data provided (to Enemalta through smart metering) vis-à-vis consumption and load patterns, to assist in medium-term grid infrastructure planning.
- Entering into contractual agreements with large consumers to limit their load at critical peak times, therefore minimizing the chances of power cuts in certain key times;
- Add-ons to smart metering.

Investing in Green Energy results in the need for (further) Green Jobs

Increased investment in PV (Photovoltaic) and solar water heaters has increased demand for specialised staff to plan, install and maintain such systems. Given that RES are still relatively new technologies, in particular within the local context, with a high up-front investment requirement, consumer acceptance is crucial to ensure successful long term deployment of the technologies. Thus, adequate resources will be needed such as trained engineers, architects and installers with the appropriate knowledge and skills to ensure that proper guidance is being given in the selection of systems

appropriate for Malta's climatic conditions.

4.6 Proposed Actions

14. Household Scheme for investment in photovoltaics

- By year end 2018: Draw up a scheme whereby the many households that would like to contribute to greener energy but do not have the necessary roof space, are offered an opportunity to participate (invest and reap benefits). Such measure would therefore see a collaborative effort between Government, the business community and households⁵⁷.

15. Energy Performance Contracting

Create a legal framework to support Energy Performance Contracting whereby Energy Service Companies (ESCO) can implement renewable energy projects or energy efficiency projects and recover their investment plus margin through savings achieved by customers or by sharing any relative feed-in tariff. Credits due to investors would be compensated from the financial savings received directly from the reduction of the customer's energy bill.

- By year end 2017: Develop further the policy framework in line with current legal framework.

16. Resource Efficiency Audits

The premise behind this measure is that resource audits are to, in due course, become mandatory for the vast majority of entities on the island. To date voluntary energy audits of hotels are already carried out and these are now mandatory for large enterprises. It is also an obligation under the Energy efficiency directive to promote energy audits for SMEs.

Measures:

- By year end 2016: A working group is to be set up with the remit of drawing up the structure/mechanism/criteria for the certification of auditors to conduct

⁵⁷ This Measure would require the below indicated Measure – Energy Performance Contracting. Furthermore it is imperative that guidelines and regulations are in place to ensure that photovoltaic cells do not end up adversely affecting the visual and spatial environment.

resource efficiency audits.

In view of the increasing importance given to resource efficiency audits, it is imperative to have the right structure in place to 'certify' auditors thereby assisting SMEs in their endeavours in this regard (through the provision of list of 'certified' auditors and their contact details)

- By end 2016: Actively promote and entice small and medium sized entities to carry out resource efficiency audits, and made aware that such provision will eventually become obligatory for all entities employing 10 or more employees. (Legal Notice 196/2014 stipulates that large organisations, companies employing more than 250 employees, are obliged to provide energy and water efficiency audits). This is to be achieved giving preference where possible (such as added points in the case of a competitive scheme) to entities that undertake such audits when these apply for grant schemes or similar. By mid-2017: Resource efficiency audits are to be obligatory for all entities seeking to be eligible for any resource efficiency improvement support scheme – thereby ensuring that any funds distributed truly address most opportune initiative with respect to the entity concerned. As from 2017: Government to commence introducing environmental standard operating procedures within the Government entities/departments, and thereafter assess and evaluate the environmental performance of such entities.

Such a stance is to be highly publicised and used to instigate the private sector to follow suit and implement environmental procedures. Furthermore, to further instigate such move, grant schemes or similar are to give preference to (such as added points in the case of a competitive scheme) entities that attain environmental certification or similar (ISO14001, EMAS, EU Eco-labelling or similar).

- By mid-2018: All government entities to have a formal energy and water efficiency audits, and conservation measures identified.

17. Agri-Business: Facilitate MEPA Permitting Processes

- By mid-2017: Facilitate MEPA permitting for PV generation solar panels and other endeavours relating to sustainable development, with due consideration given to the rural landscape. In this regard stringent regulations (comprising technical guidelines) need to be drawn up and adhered to (and enforced).

5. TRANSPORT AND MOBILITY

Transport systems and services are fundamental to our economy and our quality of life. Nonetheless, transport's adverse impacts comprise: greenhouse gas emissions, air pollution, noise, and space consumption⁵⁸. Present patterns of transportation – based mainly on petrol and diesel-fuelled motor vehicles generate serious social, environmental, cultural and economic damage and are highly unsustainable.

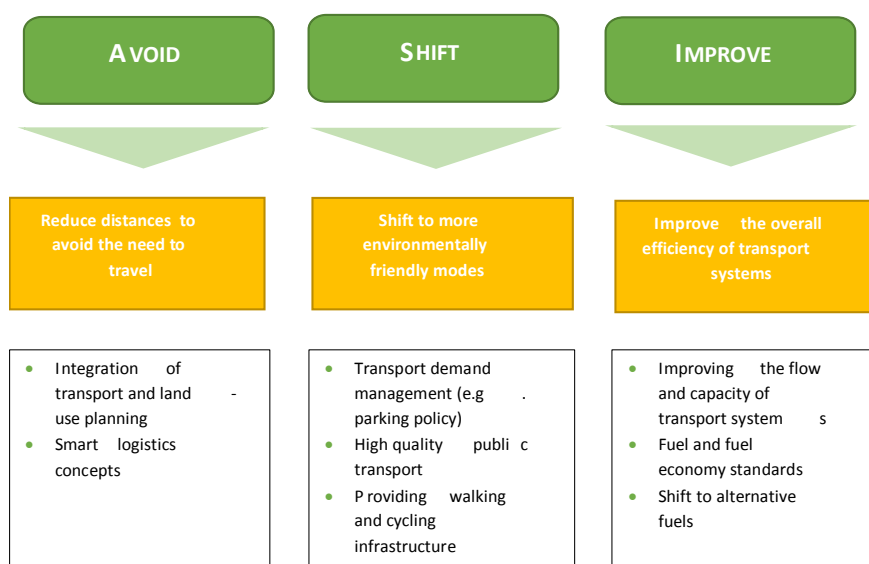
Transportation currently:

- Consumes more than half of global liquid fossil fuels;
- Emits nearly a quarter of the world's energy-related CO₂;
- Generates more than 80% of the air pollution in cities in developing countries;
- Results in more than 1.27 million fatal traffic accidents per year; and
- Produces chronic traffic congestion in many of the world's urban areas.

Investing in energy and resource efficiency – Transport. United Nations Environment Programme 2011

With the global vehicle fleet expected to grow further over the coming years, a 'business as usual' approach is clearly unsustainable.

To counteract such adversities and shift to a green(er) transport system a holistic **Avoid – Shift – Improve** approach in all areas of transport that is passenger/freight, land/marine/aviation is required.



Source: Transport in the green economy – giz.de

⁵⁸ Transport in the Green Economy. Daniel Bongardt and Philipp Schaltenberg

5.1 Local perspective

According to the latest National Greenhouse Gas Emissions Inventory for Malta 2013, road transport currently accounts for 16.9% of the total greenhouse gas emissions generated in Malta. It is therefore imperative that at national level action is taken to reduce greenhouse gas emissions from transport.

This will necessitate the provision of genuine, viable and attractive low carbon travel options for both businesses and ordinary citizens. In this respect, rather than imposing a particular mode of travel people should use, it is the Government's intent to broaden the low carbon options available for people and businesses; thereby simplifying the transition to green(er) modes of transport. That said, it must be pointed out that the technical challenges are greater for aviation and shipping, but these modes too will require a transformative improvement in efficiency in a move towards a more sustainable mode of transport.

For the strategy towards greening the transport and mobility sector to succeed, it is imperative that concerted efforts rely not merely on Government, but equally importantly on businesses and the population at large.

5.2 Action Areas for Consideration

- Public transport

A key factor to moving to a greener transport and mobility option revolves around public transport and the provision of a reliable and efficient service thereby making it an attractive choice for locals. This would invariably lead to less congested roads and less pollution in our atmosphere. That said, international research⁵⁹ evidences that while individuals indicate a willingness to change their travel behaviour in favour of greener options, evidence demonstrates that there is a particular resistance to changing behaviours considered to constitute a significant lifestyle change – of which transport is one.

In this respect a challenge to be addressed in efforts to meet carbon objectives relates to the cost of motoring in comparison with the costs of public transport and determine the optimal price (that of public transport in relation to utilising private transport) that entices individuals to opt for public transport.

- Green School Transport

⁵⁹ <http://www.dft.gov.uk/pgr/scienceresearch/social/>

The current state of affairs on local roads with respect to traffic is such that immediate action is necessary. In the UK the Government has undertaken a successful initiative that revolves around Green School Transport, whereby as a pilot project, a number of schools entered into a competition – with the primary aim being ‘green school transport’ thereby increasing the number of pupils walking, cycling, park ‘n’ stride, carpooling or using public transport. This also eased congestion by reducing the number of private cars arriving at the school gates.

The potential benefits of this measure are in fact far reaching in that by promoting sustainable transport modes (walking, cycling, car-pooling or public transport), the schools will also improve pupils' health and fitness. The journey to school is an ideal way for children to take part in regular physical activity, to interact with their peers, and to develop the road sense children need as pedestrians and cyclists. Alternative modes of transport also improve children's alertness. The schools will also lessen their overall impact on the environment, by reducing emissions and pollution⁶⁰.

- Promoting change through better information

It might not always be possible to opt for public transport and walking and cycling may sometimes be impractical. It is therefore equally important that people with access to private transport have better information on using their vehicle more efficiently (thereby limiting the adverse effects on the environment). In this respect, it would be opportune to have a campaign related to fuel efficient driving⁶¹.

- Activity at town/city level

If Malta is to embark on a greener strategy, then it is imperative to rope in local councils such that they too contribute to climate change goals. Local Councils could be involved in initiatives aimed at achieving a modal shift from private vehicle utilisation to other modes of transport (such as walking and/or cycling) for people residing/working in their locality. These could comprise:

- Offering alternative modes of transport for people within their respective communities. Such endeavours could also incorporate the school/s within the community and seek alternative ways for kids to travel to and from school.

- Using market mechanisms to encourage a shift to lower carbon transport

⁶⁰ From feedback attained from EkoSkola, an issue in this regard could be the lack of funds to carry out certain initiatives.

⁶¹ In the UK for example, there was the ‘ACT ON CO₂’ campaign that promoted the steps drivers could take to buy and run their car in a way that saves fuel, money and CO₂ with such campaign consequently extended to used cars and providing better information to consumers on vans.

Factoring carbon costs into the prices one pay for transport is deemed opportune in reflecting the full costs that they impose on society, as future generations should not have to pay the climate change costs of decisions that are made today.

Such carbon costs are often seen as an incentive to be either more energy efficient and/or opt for lower carbon alternatives, while also sending the right long-term signals for investment. Fiscal measures, such as fuel duty, company car tax, vehicle excise duty and air passenger duty provide these price signals to businesses and consumers.

That said, carbon pricing is a complex matter. The price itself can be subject to a range of uncertainties and changes in costs can produce very different responses from people, business or the economy as a whole. And as pricing carries implications across many aspects of society – from fairness and equality to both individual and public finances – the use of pricing measures can be controversial. Research shows that people recognise the use of price signals as a way to influence choices and cover environmental (and other) costs⁶², though are understandably unwilling to pay higher prices for transport. A study to determine the most apt pricing strategy ought to be carried out.

- Eco-driving techniques

In efforts to carry out a modal shift to current practices, it would be opportune to promote eco-driving techniques to new and existing drivers by integrating eco-driving into the driving test and also undertake initiatives to promote eco-driving techniques to existing drivers.

Integrating eco-driving techniques into the driving test is deemed opportune in ensuring that new drivers know from the outset how to drive in a way that will reduce CO₂ emissions, and be economical and safe.

5.3 Upcoming endeavours

Development of a National Transport Strategy and Master Plan

The Integrated Transport Strategy Directorate is driving the process of developing a National Transport Strategy (NTS) and Transport Master Plan (TMP) covering all relevant transport modes (land, public transport, sea and air) for internal and international transport for the short, medium and long term.

This analysis will look closely at the needs of the country (both Malta and Gozo), identifying problems and seeking to understand what we expect to face in future – short, medium and long term. Through the National Transport Strategy, Government will

⁶² http://www.hm-treasury.gov.uk/stern_review_report.htm

develop a vision of where Malta wants to be in the long term, the strategic direction required to get there. Within this process, Government will evaluate the potential for complementary passenger transport systems aimed at reducing reliance on the private car, which inter alia shall include the possibility of introducing a light rail in specific areas within the country whilst strengthening internal scheduled passenger transport by sea. Appropriate road infrastructure measures will be introduced so as to improve the safety of pedestrians and to ensure that road infrastructure is accessible for all.

Sustainable biofuels

Promoting the use of sustainable biofuels is an important part of Government's strategy to ensure that transport fuels are cleaner, greener and less carbon intensive and an important tool for Malta to reach the aim of increasing the share of energy from renewable sources in the transport sector.

Furthermore, the bio fuel substitution obligation imposed on importer/wholesalers of fuel for the transport sector (EN590 and EN228) (equal to 4.5% in 2014) is deemed to be an important mechanism for ensuring demand and provide certainty to industry which, in turn, encourages innovative investment in new biofuels. That said, it is imperative to ensure that Government promotes the use of sustainable biofuel - one that delivers high greenhouse gas savings and low social and environmental impacts. Regulations are also deemed fundamental to prevent unsustainable biofuels from being produced and consumed through minimum sustainability standards.

Using market mechanisms to encourage a shift to lower carbon transport

The Government's stance with respect to fiscal measures comprise incentivises directed at fuel-efficient vehicle purchases/alterations, encouraging more fuel-efficient behaviour and potentially encouraging lower carbon transport choices more generally. Initiatives in this respect include:

- Establishing a network of charging points, for full electric vehicles, in line with targets of 5,000 electric cars on the road by 2020; and
- Introducing various measures to encourage the conversion of cars to auto gas and the promotion of electric cars, apart from the bio fuel substitution obligation which has been imposed on importer/wholesalers of fuel for the transport sector (EN590 and EN228).

Furthermore, to ameliorate the current transport sector's situation, the Maltese Government is undertaking the following actions:

- A holistic strategy that includes both fiscal incentives and investment in infrastructure has been put forward in the Malta National Electro mobility Action

Plan (MNEAP), which aims to accelerate the uptake of electro mobility. Furthermore, to improve energy efficiency in transport and reduce emissions, Government is providing individuals who purchase electric vehicles with a grant of up to €4,000. This scheme has been also extended to NGOs and businesses. As at end 2014, 95 charging points were installed throughout Malta and Gozo, with an additional 12 charging points and three solar car ports deployed early this year. A target of 5,000 electric cars and a total of 500 charging points need to be installed by 2020.

- Extension of the auto gas conversion scheme, with the aim of converting 250 cars in 2015 currently running on petrol/diesel to auto gas by means of a €200 rebate per car. This should make it more attractive to owners to convert their cars to auto gas. During 2014, 306 vehicles were converted.
- Promoting the use of bicycles, through a once-only grant of 15.25% on the purchase price of the bicycle subject to a maximum grant of €70, in the case of a non-mechanised bicycle, and a maximum grant of €150 in the case of a pedelec bicycle. Moreover, a new measure introduced in 2015 encourages parents to make use of school transport, rather than taking their children to school themselves, thus reducing road traffic. Parents, whose children attend private or church schools will be eligible for a tax rebate of up to €150, if they make use of school transport.
- Another car scrappage scheme has been launched to incentivise the purchase of new motor vehicles whilst at the same time reducing the number of old motor vehicles from the road.
- During 2014, an additional 1km of the TEN-T road network was constructed. Access network upgrading for two of Malta's sea ports as well as the upgrading and refurbishing of international port infrastructures is planned with a view to improve cargo and passenger capacity. Government aims to conclude the National Transport Strategy and a Master Plan by the end of 2015 which aims at identifying policy and infrastructure options to alleviate road traffic bottlenecks on the TEN-T and other strategic roads.
- Commitment to raise the proportion of renewable energy used in all forms of transport to 10% by 2020 (estimated at 3.3% in 2013).
- The utilisation of a more efficient bus fleet and increased usage of this service. Government is also evaluating and analysing the potential for other complementary mass passenger transport systems.
- Retrofitting road and street lighting by smart lighting were also launched.

5.4 Proposed Actions⁶³

18. Green Public Transport

A. E-cab

- By end 2016: Carry out the necessary studies to determine the most apt framework for the delivery of water bourn public transport. Such study is to highlight better modal integration, thus providing easier access to Valletta centre (and not only) for visitors arriving with the water ferry from Sliema (and not only).

B. E-Bicycles

- By end 2016: In line with Government's initiative through a once-only grant of 15.25% on the purchase price of the bicycle subject to a maximum grant of €70, a study is to be carried out to determine how uptake from this mode of transport could be increased, possibly roping in local councils thereby identifying ways and means that this means of transport could be better supported at council level.

19. Revaluating the School Transport System

- By year end 2016: Set up a working group to re-examine the School Transport System and investigate the reasons why parents resort to taking their children to school themselves and put forward proposals with which to rectify any identified problems.

The results derived thereof are to be implemented by 2018.

20. Conversion of vehicles to autogas

- A. **Government** - The Government's endeavours comprise incentivising the conversion of vehicles to autogas. However it is felt that more ought to be done in this respect. Through this action, Government is to lead by example and convert its existent fleet (according to data obtained from the NSO Government has a fleet of in excess of a 1000 vehicles of which approximately 600 are passenger vehicles) to auto gas.

⁶³ The here indicated actions are to dovetail with the National Air Quality Plan and with the monitoring measures that have been put forward under the Manifesto Proposal regarding cleaner air.

- By year end 2016 – 50% of Government petrol driven vehicles be converted to gas powered;
- By year end 2017 – number of Government vehicles converted to gas powered to exceed 75% of total.

B. Company Fleets/Commercial vehicles - Commercial vehicles and company fleets (with more than 10 vehicles) would also be targeted.

- By end 2016: Such entities will be encouraged to convert their fleets through a one-time grant/rebate system, though made aware that such conversion would become obligatory as from 2018.

An economic evaluation will need to determine the viability and extent of petrol stations that would need to offer the required fuel to make it 'viable/realistic' for such switch to take place (MRA Code of Practice and MEPA Petrol Station Policy). To date there are 4 licensed Autogas Stations, with another 18 pending applications (7 are in existing petrol stations, with the others being new petrol station applications).

21. Public transport

- By year end 2016 – (While the impetus should be towards innovative energy efficient vehicles) commence the process such that public transport utilises more efficient and sustainable fuel (B20 fuel⁶⁴), ensuring that all public transport utilise B20 fuel by year end 2017.

22. Publicity Campaign

- By mid-2017: A publicity campaign will be embarked upon explaining the benefits of gas over conventional fuel. This shall include an assessment of economies of scale that can be attained by owners of various vehicle types.

23. Electric vehicles and conversion to auto gas take up

Government through Transport Malta has launched a grant scheme for the purchase of Electrical Vehicles and is also in the process of putting in place a National Electric Car Charging Network on a national scale. The charging infrastructure roll out will take place

⁶⁴ 20% biodiesel, 80% petrodiesel is labeled B20. Omidvarborna et al. "Characterization of particulate matter emitted from transit buses fuelled with B20 in idle modes". Journal of Environmental Chemical Engineering 2 (4): 2335–2342. doi:10.1016/j.jece.2014.09.02

in phases and scaled to meet the demand by 2020 as indicated in the MNEAP.

- By year end 2016: Carry out a study to determine the most apt strategy to maximise the purchase and contribute to the reduction of older vehicles. The study is to assess the impact and identify options with which the economic benefits of Battery Electric Vehicles and Battery Electric Quadricycles and autogas conversion could be maximised. The same assessment would need to take into consideration the conversion of cars to gas (and its viability/limitations) and subsequently identify viability of the two options and most opportune strategy to reap maximum benefits from both schemes.

24. Improving Public Transportation usage through ICT Enablers

Integration of a Bus Tracker System with an automated messaging system on

A. Bus stops:

- By end 2016: Introduce a bus tracking system at bus stops. The infrastructure for such system is deemed to be already in place (Arriva), hence it is a matter of updating and utilising it.

B. Mobile phone/tablet application

- By year mid 2017: Design a mobile/tablet application that enables the provision of:
 - Up to the minute information on bus arrivals;
 - Ideal connections/stops to arrive at a destination;
 - Identify shortest route and/or Most Scenic route.

25. Rejuvenation of the Vehicle Fleet

To take advantage of the EU directive which requires that new private and light commercial vehicles become progressively more efficient it is necessary that Malta's ageing vehicle fleet be replaced at a much faster rate than at present. It is therefore proposed that in line with the commitments pledged under Article 7 of the Energy Efficiency Directive, vehicle replacement is incentivised through a more aggressive scrappage scheme and possibly a revision of the vehicle registration and circulation tax systems to promote the more efficient vehicles and dissuade the use of old vehicle stock.

- By year end 2016: Carry out an assessment of the current scheme (comprising a revision of the vehicle registration and circulation tax systems) to identify the most opportune way to 'encourage' the local population to utilise more efficient

vehicles and dissuade the use of old vehicle stock.

26. Public/ procurement of vehicles by Government

- By mid-2017: In line with Government's commitment to lead by example, any vehicles procured by central government departments and their agencies are to comply with the following standard - average emissions of new cars standard 95 g/km (4.1 l/100km or 57.6 mpg) (with the impetus always being towards the purchase of innovative energy efficient vehicles).

6. TOURISM

Tourism has significant potential as a driver of growth for the world economy representing 5% of world Gross Domestic Product (GDP), and contributing to about 8% of total employment⁶⁵ (directly and indirectly).

Nonetheless, the development of tourism has brought with it significant challenges with the sector currently contributing around 5% of global greenhouse gas (GHG) emissions, with such figure expected to grow substantially under a business-as-usual scenario⁶⁶. The reasons for this can be listed as follows:

- The rapid growth in both international and domestic travel;
- The trends to travel farther and over shorter periods of time;
- The preference given to energy-intensive transportation;
- Excessive water consumption compared with residential water use;
- Discharge of untreated water;
- The generation of waste;
- The damage to local terrestrial and marine biodiversity; and
- The threats to the survival of local cultures, built heritage and traditions.

These are all challenges the industry has to face in its quest to become more sustainable.

Tourism in the green economy refers to tourism activities that can be maintained, or sustained, indefinitely in their social, economic, cultural, and environmental contexts. (UNEP, UNWTO 2005).

Endeavours to increase sustainability of the sector will require efficiency improvements in energy, water and waste systems, among others in order to reduce costs and enhance the value of biodiversity, ecosystems and cultural heritage. Such a stance reinforces the employment potential of the sector by moving towards green(er) practices. Furthermore, there is increasing evidence that more sustainable tourism in rural areas can lead to more positive poverty-reducing effects.

In the years to come, more and more tourists will be demanding the greening of tourism and opting for destinations that prove commitment towards sustainable development. A report by the United Nations Environment Programme (UNEP – 2013) indicates that “... a 2010 survey undertaken by VISA and the Pacific Asia Travel Association (PATA) found that Chinese have a preference for environmentally friendly tourism and cultural immersion programs (VISA 2010). Furthermore, in a 2012 poll undertaken by Blue and Green Tomorrow, 47 per cent of respondents answered that they would consider the ethical or environmental footprint of their main holiday in 2013 (Blue and Green 2012). Research

⁶⁵ Tourism in the Green Economy - UNEP and UNWTO. 2012

⁶⁶ Tourism in the Green Economy - UNEP and UNWTO. 2012

indicates that consumers are willing to spend more on their holidays if they can be assured that workers in the sector are guaranteed ethical labour conditions (ILO 2010). Also, in a Trip Advisor survey, 34 per cent of travellers indicated that they are willing to pay more to stay in environmentally friendly hotels (Pollock 2009). According to research by the Foundation of Netherlands Volunteers in 2008, 58.5 million American travellers would pay more to use travel companies that strive to protect and preserve the environment. There is clear and rising demand for more sustainable tourism globally”⁶⁷.

The movement toward more sustainable tourism implies significant changes in the performance of conventional tourism, as well as growth and improvements in smaller niche areas centred on natural, cultural and community resources. The growth of the latter, as a proportion of the industry as a whole, may have proportionately higher positive effects on biodiversity conservation and rural poverty reduction; whereas the greening of conventional and mass tourism is likely to have its largest effects on resource use and management, as well as on increased economic spill-overs and inclusion of disadvantaged populations.

As with other sectors, it is paramount to involve all stakeholders to support a move towards green tourism. Specific effort is needed to rope in the small operators who are often very little engaged in these types of efforts / initiatives.

Definition of Sustainable Tourism

Sustainable tourism development guidelines and management practices are applicable to all forms of tourism in all types of destinations, including mass tourism and the various niche tourism segments. Sustainability principles refer to the environmental, economic and socio-cultural aspects of tourism development, and a suitable balance must be established between these three dimensions to guarantee its long-term sustainability.

Thus, sustainable tourism should:

1. Make optimal use of environmental resources that constitute a key element in tourism development, maintaining essential ecological processes and helping to conserve natural resources and biodiversity;
 2. Respect the socio-cultural authenticity of host communities, conserve their built and living cultural heritage and traditional values, and contribute to inter-cultural understanding and tolerance;
 3. Ensure viable, long-term economic operations, providing socio-economic benefits to all stakeholders that are fairly distributed, including stable employment and income-earning opportunities and social services to host communities, and contributing to poverty alleviation.
- Sustainable tourism development requires the informed participation of all relevant stakeholders, as well as strong political leadership to ensure wide participation and consensus building.

⁶⁷ Green Economy and Trade. United Nations Environment Programme, 2013

- Achieving sustainable tourism is a continuous process and it requires constant monitoring of impacts, introducing the necessary preventive and/or corrective measures whenever necessary.

Source: UNWTO, UNEP (2005), Making Tourism More Sustainable.

6.1 Eco Tourism

Ecotourism first grew out of the global environmental movement in the late 1970s. While the development and growth of ecotourism took various paths in different parts of the world, by the early 1990s, ecotourism, along with nature-based, cultural, heritage and adventure tourism, had become among the fastest growing sectors of the tourism industry worldwide. More recently, ecotourism has helped to spawn a variety of new terms, such as sustainable tourism, pro-poor tourism, and responsible tourism, all of which encompass the concept that tourism can and should benefit conservation and host communities. Ecotourism is distinguished by its emphasis on conservation, education, traveller responsibility and active community participation. The International Ecotourism Society (TIES) defines ecotourism as *“responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education”*.

In this respect, the founding principles of ecotourism revolve around:

- Minimizing physical, social, behavioural, and psychological impacts.
- Building environmental and cultural awareness and respect.
- Providing positive experiences for both visitors and hosts.
- Providing direct financial benefits for conservation.
- Generating financial benefits for both local people and private industry.
- Delivering memorable interpretative experiences to visitors that help raise sensitivity to host countries' political, environmental, and social climates.
- Designing, constructing and operating low-impact facilities.
- Recognizing the rights and spiritual beliefs of the Indigenous People within the community and working in partnership with them to create empowerment.

6.2 Local perspective

Since 2007, Malta's tourism performance has been on the high side of European and Mediterranean performances, but Malta's size poses a number of unique challenges.

The size of our islands puts us at a greater risk, as tourism activity is not limited to any particular zone or region but is spread across the entire nation. Environmental consciousness both among the Maltese as the host population and our visitors will continue to increase and this will give rise to the demand for sustainable destinations in which nature and population will play an increasingly prominent role.

It is the Government's intention to stimulate competitiveness and promote the development of responsible and sustainable high-quality tourism over the coming years.

Tourism Policy Vision to 2030

Promoting and managing year-round tourism growth to the Maltese islands through the dual principles of competitiveness and sustainability. Maximising the socio-economic contribution of the tourism industry by aiming for higher added value based on quality service and products which will lead to the re-branding of the Maltese islands as a destination of choice for established and emerging markets and segments worldwide.

National Tourism Policy 2015 – 2020

In a move towards a more sustainable sector, way back in 2002 the Malta Tourism Authority launched the ECO certification scheme – a national scheme for ensuring the environmental, socioeconomic, and cultural sustainability of hotels on the Maltese Islands (recognised by the Global Sustainable Tourism Council as fully reflecting the GSTC criteria). Through the years this scheme has been revised (most recently in 2012) and today the criteria tap into numerous areas that comprise:

- Sustainability management systems
- Waste management
- Purchasing
- Control of chemicals
- Energy
- Water
- Air quality
- Noise
- Building and green areas
- Local culture & national surroundings
- Communication with customers

In 2006 Malta joined the Blue Flag Programme - a voluntary ecolabel awarded to over 3450 beaches and marinas in 41 countries across Europe and the World.

The Blue Flag Programme is owned and run by the independent non-profit organisation Foundation for Environmental Education (FEE) that is represented locally by Nature Trust.

Furthermore, following the success of two beach replenishment projects conducted by the Malta Tourism Authority (MTA); namely St George's Bay and Bugibba Perched Beach, the Authority widened its beach management operations to other coastal stretches mainly: Golden Bay, Mellieħa Bay, Qawra Point and Font Għadir rocky coast with the aim of striving to meet EU and international standards in safe, bathing water quality, services and environmental awareness. The sustainable management approach, abiding by the international Blue Flag Programme Criteria, resulted in the achievement of international and national Quality Awards.

Specific challenges that need to be resolved through the greening of the industry include:

• Energy and greenhouse gas (GHG) emissions	• Effective management of built and cultural heritage
• Waste management	• Water consumption
• Loss of biological diversity	• Planning and governance

Tourism in the Green Economy - UNEP and UNWTO. 2012

6.3 Eco Gozo

Eco Gozo is a vision for the sister island of Malta to become more sustainable and indeed become an eco-island by 2020. It is Government's intent to see quality of life in Gozo improving further through education, economic development and social progress by reducing its carbon and water footprints. The aim is, therefore, to provide a secure future for the island and its inhabitants by striving to *"... become even more beautiful, inspiring, welcoming, thriving, inclusive and successful. A healthy and successful place to live in, in equilibrium with the environment."*⁶⁸

6.4 Rural Tourism

Rural tourism has grown rapidly in recent years, with this niche market being particularly important in terms of rural income and employment, typically providing between 10%

⁶⁸ <http://www.eco-gozo.com/>

and 20% of rural income and employment (twice tourism's income and employment levels averaged across Europe)⁶⁹.

The OECD's Rural Development Programme tackled the definitional issue in the early 1990s. They concluded that rural tourism, in its 'purest' form, should be:

- i. Located in rural areas
- ii. Functionally rural - built upon the rural world's special features of small-scale enterprise, open space, contact with nature and the natural world, heritage, 'traditional' societies and 'traditional' practices.
- iii. Rural in scale - both in terms of buildings and settlements - and, therefore, usually – but not always - small-scale.
- iv. Traditional in character, growing slowly and organically, and connected with local families. It will often be controlled locally and developed for the long-term good of the area.
- v. Of many different kinds, representing the complex pattern of rural environment, economy, history and location. (OECD, 1994a

Rural tourism has the capacity to expand, be better organized and use good practice more widely and has great potential to raise local and national prosperity, to help conserve Europe's rural heritage. Strengthening market knowledge, increasing skills, improving governance, partnerships and networking, and creating innovative ways forward are all seen as keys to success, as is the development of more sustainable tourism including moving towards low carbon approaches⁷⁰.

Indeed, rural tourism and industrial heritage tourism are all special interest niche market tourism areas that continue to grow, spurred by the rapid expansion of the mass media into niche markets, by the internet's ability to inform, by new transport facilities, and by the surge in individualism and intellectual curiosity that society has seen.

Nationally, the **Malta Goes Rural project** sought to promote the Maltese rural heritage through the setup of walking trails and small scale infrastructural interventions with the main aim to improve accessibility in semi-rural, rural and natural areas. Targeted at the relational tourist and locals, the project activities sought to identify the pull factors that can strengthen the rural tourism product in Malta.

Likewise, in Gozo, investments have been directed at creating a number of walking trails in order to build a stronger and more competitive rural tourism offer.

⁶⁹ Directorate-General for Internal Policies. Policy department. Structural and Cohesion Policies B. Industrial Heritage and Agri/Rural Tourism in Europe. European Parliament. 2013

⁷⁰ Point 45 of the EP resolution P7_TA(2011)0407

6.5 Action Areas for consideration

- Financial Assistance

The majority of SMEs (in the tourism industry) single greatest limiting factor for greening is lack of access to capital. Governments and international organizations can facilitate the financial flow (through grants) to these important actors with an emphasis on contributions to the local economy and poverty reduction.

- Public-private-partnerships

Public-private-partnerships can spread the costs and risks of large green tourism investments.

- In-kind support

Besides reducing administrative fees and offering favourable interest rates for green tourism projects, in-kind support such as technical, marketing or business administration assistance, could also help.

- Recognized standards for sustainable tourism

The promotion and widespread use of recognized standards for sustainable tourism, such as the Global Sustainable Tourism Criteria (GSTC), can help businesses improve sustainability performance, including resource efficiency, and assist in attracting additional investment and customers.

6.6 Upcoming Endeavours

Government's policy and direction for the years comprise:

- Supporting the catering sector through training and advice on aspects that comprise – going green.
- Incentives supporting green tourism
- Encourage growth during the off-peak months by targeting markets which tend to peak differently from other markets;
- The development of the city-tourism dimension to ensure that the social and economic development arising from urban regeneration opportunities as a result of the Valletta 2018 event are fully exploited;
- The improvement of environmental standards across all levels;
- Ensuring the effective cleansing of roads and public areas, as well as adequate waste separation and collection to meet demand;
- Delving further into the possibility of Blue Flag marinas;

- Further monitoring and effective enforcement for Protected Coastal Areas and Marine Conservation;

6.7 Proposed Actions

27. Incentivising the Tourism Industry to become more carbon neutral

This measure seeks to assist the tourism industry to become more carbon neutral by encouraging tourism businesses to invest in equipment/activities/processes that enable them to become more sustainable.

Entities are to become more aware and responsible of their carbon footprint with a price tag on facilities that adversely affect the environment (carbon footprint) thereby instigating businesses to consider alternative sources. This will help limit the adverse effects that utility price hikes could have on the industry.

- By year end 2016: Carry out a study to devise the most apt feebate system for the sector. Concurrently entities are to be enticed to measure their current carbon footprint and identify actions that would enable them to lower it (carbon footprint). During this phase such entities will also be in a position to calculate the fee/rebate due if the system is introduced.
- By year end 2018: Following a two year trial period, subsequently launch its implementation. A carefully designed feebate⁷¹ system will result in the more efficient entities attaining a higher/ rebate (capped at a pre-established amount) while those with a high carbon footprint will have to pay a fee. Thus this system rewards those entities that make significant steps towards ecological/sustainable solutions, whilst penalizing those that do not move in this direction.

Such a measure also ensures due consideration to carbon footprint at the onset of any investment (at the design process).

⁷¹ Feebate systems are aimed at fostering those activities, practices or products that are deemed more environmentally friendly at the expense of others that are less. They do so by means of a simultaneous use of both fees and rebates. The activities that take less care of the environment compared to the average are charged fees and the collected amount is transferred to the most ecological ones in the form of rebates, making them more competitive compared to the initial situation. The more environmentally harming an activity is the greater the fee is, and the friendlier it is the more it is subsidized by means of a rebate. An activity with the average environmental performance is not either charged or subsidized. Globally, fees and rebates cancel each other out, and therefore this economic tool is neutral for the budget of the Administration that sets it up (Jansen and Denis, 1999), which only assumes the administrative costs of managing the system. - <http://www.bvsde.paho.org/bvsacd/cd51/foster.pdf>

28. Tourist Green Label Network

- By year end 2016: MTA to revise (and extend) the scope of the current eco-certification system and coordinate with Nature Trust Malta to further promote Green Key⁷² (With Green Key being one of the FEE programmes run by Nature Trust Malta).

29. Resource Efficiency audits

In sync with Measure 16, resource efficiency audits for the tourism industry are to, in due course, become mandatory for the vast majority of entities on the island.

Measures:

- By year end 2016: A working group is to be set up with the remit of drawing up the structure/mechanism/criteria for the certification of auditors to conduct resource efficiency audits.

In view of the increasing importance given to resource efficiency audits, it is imperative to have the right structure in place to 'certify' auditors thereby assisting SMEs in their endeavours in this regard (through the provision of list of 'certified' auditors and their contact details)

- By end 2016: Actively promote and entice small and medium sized entities to carry out resource efficiency audits, and made aware that such provision will eventually become obligatory for all entities employing 10 or more employees. (Legal Notice 196/2014 stipulates that large organisations, companies employing more than 250 employees, are obliged to provide energy and water efficiency audits). This is to be achieved giving preference where possible (such as added points in the case of a competitive scheme) to entities that undertake such audits when these apply for grant schemes or similar.
- By end 2016: Resource efficiency audits are to be obligatory for all entities seeking to be eligible for any resource efficiency improvement support scheme – thereby ensuring that any funds distributed truly address most opportune initiative with respect to the entity concerned. Furthermore, any fiscal incentives/assistance is to be measured against the standard's greening effectiveness following its implementation.

⁷² Green Key is an eco-label awarded to around 2,400 hotels and other sites in 50 countries worldwide. The Green Key Eco-Rating Program is a graduated rating system designed to recognize hotels, motels and resorts that are committed to improving their environmental and economic performance.

30. Accommodation entities to produce audited figures on water consumption per bed night

This method of determining water consumption is utilised by both the local and international eco labels and is deemed to be the most transparent and comparable measure of performance. Determining comparable figures of water consumption is fundamental for the drafting of tangible and realistic goals and objectives to better safeguard the environment and water usage.

- As from mid-2017: Introduce a pilot study whereby a number of entities are to produce audited figures on water consumption per bed night. Following a review of the project, this endeavour will subsequently be rolled out to all accommodation entities to produce audited figures on water consumption per bed night.

Subsequently investment schemes would be related to entities' ability in their carbon footprint per bed night by an established percentage which percentage would (at least initially) be established together with the industry. Furthermore, such figures could be utilised to promote entities that are best performers with a view to having a positive ripple effect on enticing other enterprises to seek ways and means of increasing their water usage efficiency.

31. Waste water

There is an urgent need for tourism entities to recycle water, and make better use of grey water.

- By 2018: The collection and provision of water treatment for re-use should be mandatory for new large premises of more than fifty (50) bedrooms and resort-type hotels.

7. AGRICULTURE, BIODIVERSITY AND GREEN INFRASTRUCTURE

7.1 Agriculture

With farmers managing almost half of the EU's land area⁷³, farming inevitably has a big influence on Europe's landscapes and the quality of its environment, with the loss of traditional farming practice to intensive agriculture throughout the EU leading to:

- Soil erosion;
- Water pollution;
- Over-exploitation of water resources;
- The loss of biodiversity (semi-natural habitats, wild species);
- Pesticide-born damage; and
- Risks for human health

In view of such adversities, sustainable agriculture is key for long-term and inclusive growth, due to its strong multiplier impact on other sectors⁷⁴.

7.1.1 Local Perspective

Farming plays an important role in Malta, providing food for the population; helping to shape and maintain the islands' landscapes and biodiversity; and contributing to the economic and cultural life of rural communities.

Today, these roles are threatened by challenges and pressures which have tended to erode the positive linkages between Malta's natural resources, its production of food and other valued resources for the population, and its maintenance and support of the wider rural economy and community. **Though the potential exists to rebuild these linkages to the benefit of Malta as a whole, this will require careful and sustained action (by all), in order to be realised.**

Anticipated trends in future markets indicate that over the next decade farmers will face increased prices for key inputs (feed, fertilisers, water etc.) and see more modest increases in output value. In order to maintain and increase sector viability, Maltese food and farm businesses will thus need to add more value, save costs, and improve quality, productivity and efficiency. Furthermore, the sector needs to reduce its environmental footprint, and to connect more closely with its consumer base – both residents and tourists visiting the Maltese islands. There are also opportunities for farmers to become more actively engaged in positive landscape management and rural tourism.

⁷³ European Environment Agency (EEA)

⁷⁴ Sustainable agriculture for the future we want. European Commission.

In most sectors within agriculture, there is significant scope to improve efficiency in resource use (water, nutrients, energy) through enhanced management designed to benefit both productivity and the environment. This situation clearly indicates the need for technical skills and sustainable approaches in order for the industry to survive and thrive in future.

An issue of concern relates to the sector's carbon footprint, with the vast majority of farming emissions coming from methane produced by livestock and their manure, or nitrous oxide produced from fertilisers. That said, the farming sector is one that presents considerable long-term challenges in view of the physical limits to how far emissions can be reduced, with farming involving complex natural cycles such as the gases produced by livestock reared for meat or dairy.

7.2 Sustainable forms of Agriculture

Agriculture has changed dramatically over the past century, due to new technologies, mechanization, increased chemical use, and specialization among others.

Although these changes have had many positive effects and reduced many risks in farming, there have also been significant costs. Prominent among these are topsoil depletion, groundwater contamination, the decline of family farms, continued neglect of the living and working conditions for farm labourers, increasing costs of production, and the disintegration of economic and social conditions in rural communities⁷⁵.

In view of the above, over the past two decades there has been an impetus towards sustainable agriculture as a means to addressing many environmental and social concerns. Furthermore, such a stance is deemed opportune in offering innovative and economically viable opportunities for growers, labourers, consumers, policymakers and many others in the entire food system. In this regard, permaculture and organic agriculture are two widely acclaimed sustainable forms of agriculture.

7.2.1 Permaculture

*Permaculture is a holistic design philosophy and the art and science of creating community eco-systems in which plants, animals, human beings, and all forms of ecological diversity interact to produce a prolific, ecologically-sound, and regenerative system that can support itself and life indefinitely*⁷⁶.

The word originated from the words 'permanent' and 'agriculture', though this concept has today expanded to signify permanent culture. Apart from identifying the ideals and

⁷⁵ <http://www.sarep.ucdavis.edu/about-sarep/def>

⁷⁶ <http://permaculturemalta.org/>

guidelines for creating a sustainable food supply, today the concept may be utilised to all aspects of creating a sustainable culture, such as housing, urban planning, economics, and interpersonal relationships (though in this report we will be primarily focusing on the agricultural aspect of permaculture).

With respect to the agricultural sector locally there could be scope to further promote permaculture among the agri-sector, as a sustainable, economically viable alternative to current operating practices.

7.2.2 Organic Agriculture

"Organic agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasises the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system." (FAO/WHO Codex Alimentarius Commission, 1999).

While there are many explanations and definitions for organic agriculture, all converge to state that it is a system that relies on ecosystem management (rather than external agricultural inputs) with due consideration given to the potential environmental and social impacts. To this end, site-specific management practices that maintain and increase long-term soil fertility and prevent pest and diseases are implemented as opposed to the use of synthetic inputs; such as synthetic fertilizers and pesticides, veterinary drugs, genetically modified seeds and breeds, preservatives, additives and irradiation.

Three different driving forces can be identified for organic agriculture:

1. Consumer or market-driven organic agriculture	Products are clearly identified through certification and labelling. Consumers take a conscious decision on how their food is produced, processed, handled and marketed. The consumer therefore has a strong influence over organic production.
2. Service-driven organic agriculture	In countries such as in the European Union (EU), subsidies for organic agriculture are available to generate environmental goods and services, such as reducing groundwater pollution or creating a more biologically

	diverse landscape.
3. Farmer-driven organic agriculture	Some farmers believe that conventional agriculture is unsustainable and have developed alternative modes of production to improve their family health, farm economies and/or self-reliance. In many developing countries, organic agriculture is adopted as a method to improve household food security or to achieve a reduction of input costs. Produce is not necessarily sold on the market or is sold without a price distinction as it is not certified. In developed countries, small farmers are increasingly developing direct channels to deliver non-certified organic produce to consumers. In the United States of America (USA), farmers marketing small quantities of organic products are formally exempt from certification.

Food and Agriculture Organisation of the United Nations
<http://www.fao.org/organicaq/oa-faq/oa-faq1/en/>

7.3 Biodiversity

Biodiversity is one of the key terms in conservation, encompassing the richness of life and the diverse patterns it forms. In this regard, the Convention on Biological Diversity (CBD) defines biological diversity as *"the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems"*.

The European Commission emphasises the importance of Biodiversity for Ethical, Emotional, Environmental and Economic reasons⁷⁷.

The Maltese Islands harbour a diverse array of flora and fauna, especially when considering the relatively small land area, the limited number of habitat types and the intense human pressure. Over 4500 species of plants and animals have so far been recorded, (not taking marine organisms into account) of which 85 of these species are endemic⁷⁸.

Such diversity is important as it maintains the functioning of a healthy natural environment and also provides us with multiple benefits in the form of life-supporting services, which are essential for our wellbeing and for the productivity of various

⁷⁷ http://ec.europa.eu/environment/nature/biodiversity/intro/index_en.htm

⁷⁸ Naturetrustmalta.org

economic sectors. Biodiversity in fact underpins sustainable development and is important for reaching goals of green growth.

Nonetheless, concern remains over the status of biodiversity and its loss, with biodiversity being adversely affected by:

- Pollution;
- Overexploitation;
- Land degradation, fragmentation and soil erosion;
- Anthropogenic climate change; and
- Biological invasions.

Furthermore there are socio-cultural factors, namely:

- Peoples' lifestyle; and
- Consumer choices.

which are adversely affecting biodiversity and are the result of the inefficient use of natural resources⁷⁹.

Urbanisation, intensive agriculture and fishing, industry and transport infrastructures exert major pressure on ecosystems, natural resources, and natural spaces. It is therefore crucial that development patterns take into account the true value of ecosystems and preserves them. All human activities must make sure that they integrate seamlessly with the fabric of the living systems. **A more efficient use of materials is important, as well as recovering them and reusing them more.**

Public information and awareness-raising is thus also necessary such that people are taught how to understand and protect biodiversity, to appreciate the true worth of services rendered by nature and to enjoy natural spaces without degrading them.

7.4 Green Infrastructure

The European Commission defines green infrastructure (GI) as *a strategically planned network of high quality natural and semi-natural areas with other environmental features, which are designed and managed to deliver a wide range of ecosystem services and protect biodiversity in both rural and urban settings*⁸⁰.

The underlying principle of Green Infrastructure is that the same area of land can frequently offer multiple benefits if its ecosystems are in a healthy state while serving the interests of both people and nature.

⁷⁹ <https://www.mepa.org.mt/biodiversity-nbsap>

⁸⁰ Building a green infrastructure for Europe. European Commission 2013

Green infrastructure (GI) has been associated with economic benefits and is considered critical for sustainable growth and social goals, which extend beyond the benefit of supporting biodiversity. GI can thus be a catalyst for economic growth providing benefits which include:

- Economic investment to attract businesses in greener settings;
- Increased land property values;
- Having green spaces near work places that increase work productivity; tourism attractiveness;
- Reduction of pollution;
- Natural flood regulation;
- Wellbeing enhancement;
- Importance for recreation, leisure and exercise;
- Climate change adaptation and mitigation.

In addition to protected areas, components of GI may include:

- Healthy ecosystems and areas of high nature value outside protected areas;
- Natural landscape features such as watercourses;
- Restored habitat patches, created to ensure the provision of specific functions;
- Artificial features and technical solutions assisting species movement across artificial landscape barriers;
- Multifunctional zones where land uses that help maintain or restore healthy ecosystems are favoured;
- Specific urban elements such as green walls and green roofs.

7.4.1 Natura 2000

At the very core of Europe's Green Infrastructure is the establishment of the Natura 2000 network - an EU-wide network of over 27,000 protected areas spanning all 28 EU countries covering approximately 18% of EU land.

It not only acts as an important reservoir for biodiversity and healthy ecosystems, which can be drawn upon to revitalise degraded environments across the broader landscape but also delivers many ecosystem services to society, the value of which has been estimated at €200–300 billion per annum⁸¹. In forming the hubs of a European Green Infrastructure, Natura 2000 sites provide a strategic focus for improving our natural environment and enhancing citizens' quality of life.

Furthermore, the EU suggests implementing a Green Infrastructure beyond protected areas in order to strengthen the coherence of the Natura 2000 network by making the core areas more resilient, providing buffers against impacts on the sites, and offering

⁸¹ Building a Green Infrastructure in Europe. European Union, 2013

practical real-life examples of how healthy protected ecosystems can be used in a way that provides multiple socio-economic benefits to people as well as to nature⁸².

7.5 Local Perspective

Despite its small size, Malta holds a varied and interesting array of habitats and hosts endemic, indigenous, and migratory species, which are essential elements of national heritage and as such also contribute to national identity.

In order to protect its natural heritage, Malta has given legal protection to just over 13% of its land area and 11 km² of its territorial waters. Some of Malta's protected areas also form part of Natura 2000, the EU's network of protected areas. As of 2008, Malta had a higher than average sufficiency of coverage of terrestrial Natura 2000 sites, at 93%.

Despite the legal protection afforded to important habitats over the last decades, Malta's biodiversity continues to be threatened, principally by land development, invasive alien species, over-exploitation of species and climate change⁸³.

7.6 Action areas for consideration

- Modernising laws and policies on landholding and the leasing of public land, to enable farmers to build up viable land-based businesses and encourage the regeneration and sensitive management of farm parcels;
- Introducing mechanisms to promote better capture and use of rainwater and significantly reduced use of groundwater, more efficient use of inputs including feed, fertilisers, pesticides, fodder and fuel, a greater focus on renewable energy production on farms and improving the returns to farms from markets and food supply chains (with due consideration to the rural landscape);
- Establishing an agency (new or existent) dedicated to upholding trading standards, to counter any fraudulent trading practices which damage the prospects of Maltese agriculture, deceive the public and engender mistrust in Maltese products;
- Building an assured reputation for high quality fresh (and processed) local food products, as well as a diverse, high quality rural tourism and visitor experience supported by products and services from the farm sector;
- Helping maintain, protect and restore the islands' distinctive and intricate landscape character and environment through consolidation of agricultural land use and management for the benefit of wider society and for tourism;

⁸² Building a green infrastructure for Europe. European Commission 2013

⁸³ <https://environment.gov.mt/en/decc/Documents/environment/National%20Environment%20Policy.pdf>

- Protecting and sustaining the key ecosystem services of water, soils and biodiversity through effective harvesting of rainwater and efficient irrigation plus reduced chemical inputs, namely lower nutrient leaching, safe use of manures, and rational use of plant protection products and veterinary medicines;
- Making a valuable contribution to climate change adaptation and mitigation in Malta, principally through more efficient and reduced use of inputs from energy-intensive production processes, and through the generation of energy from renewable sources including organic farm wastes, sunlight and wind.
- Encouraging farmers to take action themselves to reduce emissions through more efficient use of fertiliser, and better management of livestock and manure;
- Carrying out the necessary assessment/s to determine the possibility of turning waste and manure into renewable energy;
- Providing comprehensive advice programmes to support farmers reduce their emissions from energy use, and save money/increase productivity in the process;
- Researching better ways of measuring, reporting and verifying agricultural emissions;
- Reinforcing policing of nature and means of protecting species and habitats;
- Developing sufficient organic agricultural production to satisfy demand and facilitate access to these products for the greatest possible number of people.
- Ongoing greening of communities in urban areas.

7.7 Upcoming Endeavours

The sector requires a clear strategic direction and in this respect the Government has commissioned the undertaking of a rural development plan that comprises a strategic review of the current state and future potential of the agriculture sector in Malta.

Furthermore, Government is already committed to the:

- Provision of suitable water for use by the agriculture community. In this respect, Government has committed to a EUR 22m water polishing project (launched in June 2013) which is expected to produce some seven million cubic metres of recycled drainage water for industry and agriculture by 2015. Thus, this type of water is expected to act as an economic substitute to the use of ground water;
- Transformation of the Gozo experimental farm into a centre for research, development and innovation in agriculture;
- Drawing up of a National Quality Framework for Agriculture;
- Ongoing greening of communities in urban areas.

The here below identified proposals will need to be re-examined once the Agricultural Policy for Malta is finalised to better assess to what extent these have been incorporated into the said document and subsequently determine/alter time lines for action.

7.8 Proposed Actions

32. Agriculture and Permaculture

The reasoning behind models of self-sufficient and resilient micro-farms is that these farms are not small versions of large, mechanised farms, but rather large versions of small household gardens

- They are cultivated manually using various specific methods
- Compared to the conventional farm model, micro-farms:
 - are easier to establish, particularly in an urban setting
 - require small areas (parcel/s) of land
 - have lower initial investment and running costs (no mechanisation)
 - potentially offer a higher standard of living
- By year end 2018: Carry out the necessary research to assess the potential of permaculture in the agriculture industry locally, with the ultimate goal being to create new models of small-scale diversified farms.

33. Agri Access to finance

Provide preferential access to finance and investment capital for farmers via the banking system for investment in green farming practices and renewable energy projects.

- By year end 2016: Seek agreement with local banks whereby a scheme similar to the Jeremie is launched specifically for the agriculture sector (alternatively, if another Jeremie is to be launched, then a percentage be tied to green investments).
- By year end 2016: Identify other financing alternative such as Green Borrowing.

34. Reducing the carbon footprint of agriculture

Encourage farmers to reduce their carbon footprint.

- 2016 onwards: Include investment in renewables as one of the criteria in determining applications for existing funding programmes with projects by farmers with a demonstrated commitment to sustainable working practices receiving a higher ranking and therefore more likely to be accepted.

35. Improving efficiency in water irrigation systems

Numerous studies indicate the critical situation with respect to ground water extraction. While the Government is in the process of providing treated sewage effluence TSE, concerns remain among farmers as to the affect/s of TSE on their crops.

- 2016 onwards: Carry out studies on various locally grown crops to determine whether/to what extent TSE affects the quality and production of crops⁸⁴.
- 2016 onwards: Carry out the necessary research studies to determine the amount of water utilised locally for the production of various crops, identify quantities and practices that ensure quality products (per crop type) and subsequently devise a plan that encourages farmers to grow less water-demanding crops by highlighting the negative impacts of practices on quality and quantity and on the sustainability of the sector.
- Start 2016: Draw up a working group to determine the necessary protocols to be adopted in relation to initiatives (by farmers) that result in a reduction in the dependence on abstracted ground water, the adoption of which would guarantee/facilitate the necessary Malta Environment Planning Authority (MEPA) permitting.

36. Agri-Business - funded green incubation centre

To expand the provision of agricultural out-reach programmes through the development of an EU funded green incubation centre at the Government Experimental Farm with the objective of providing tangible, commercially sound advice on the environmental effects of agriculture in a manner that clearly illustrates the environmental benefits in parallel with and in support of the economic benefits of good farming practices (comprising but not limited to reduction in agri-chemicals and water usage) whilst demonstrating in tangible practical terms that good farming practice not only benefits the environment but actually benefits the profitability and economic viability and of agriculture. This should be complemented with the development of live hands on expertise on green farming methodologies; and pier mentoring programmes.

- By mid-2017: Carry out the necessary plans/studies and subsequently identify the most apt medium to tap into EU funds.

Close collaboration between MSDEC and MCAST is necessary for this action to be executed.

⁸⁴ To date MCAST students are undertaking a study on the impacts of 2nd class water for irrigation and the quality of agriculture produce focusing specifically on a cauliflower crop (*Brassica oleracea* var. *botrytis*).

37. Green Infrastructure

- By end 2017: Areas of public land to be identified to serve as components of green infrastructure thus bringing this in line with the EU's Strategy on Green Infrastructure.

38. Increasing awareness about Malta's flora and fauna

- By year mid 2016: Government is to draw up a committee comprising of, inter alia, NGOs that are to work together to draw up a guide compiled in a manner that illustrates Malta's flora and fauna and provides information about how each citizen could contribute towards supporting it. Furthermore such committee is to be the driving force for training local guides such that they are knowledgeable of Malta's flora and fauna.
- By year end 2016: A reference guide be compiled in a manner that illustrates Malta's flora and fauna and provides information about how each citizen could contribute towards supporting it.
- By year end 2017: A website/web portal is to be set up with the specific aim of:
 - Providing useful information about the topic in question;
 - Indicating ideal walking trails where such flora can be found
 - Providing a database of guides/ organisations that can assist with such walks
 - Indicating individuals/entities that can give talks on the topic; and
 - Providing any other information of relevance, as identified by the committee.

39. Educational campaign

- By year end 2017: Undertake an educational campaign aimed at highlighting the importance of buying sustainable forms or produce (such as produce from organic farming).

40. Assess the services offered by ecosystems

- By mid-2018: Assess the economic value of the services offered by ecosystems. This is congruent with the EU Biodiversity Strategy to 2020.

41. Restoring selected public garden/s and increasing awareness of biodiversity

- By end 2016: Identify public gardens which have degraded by time and need

restoring, and subsequently draw up a plan to restore such gardens over a five year period. Restoring the selected public garden/s, and their enhancement should comprise primarily the use of native species and provision of related information about them, thereby increasing awareness on biodiversity among the general population.

8. MANUFACTURING, SMEs AND SUSTAINABLE CONSUMPTION & PRODUCTION

8.1 Manufacturing

For sustainable development to be achieved, and countries move towards a greener economy, it is indispensable that societies undertake fundamental changes in the way they produce and consume goods.

Promoting sustainable patterns of consumption and production is one of the overarching objectives of sustainable development with the Rio+20 Conference setting out a basis for governments and industry to move towards greener manufacturing through the adoption of a 10-Year Framework of Programmes on Sustainable Consumption and Production (10YFP)⁸⁵.

Key messages from the Green Economy Report: Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication.

- By 2050, projections indicate that industry can practically “decouple” energy use from economic growth, particularly in the most energy-intensive industries.
- Green investment will increase employment in the manufacturing sector. For example, investments allocated to energy efficiency are expected to create an additional 2.9 - 5.1 million jobs by 2050.
- Green manufacturing strategies can help alleviating key resource scarcities, including shortages in conventionally recoverable oil reserves, metal ores and water. For example, remanufacturing operations worldwide already save about 10.7 million barrels of oil each year.
- Tracking progress will require governments to collect improved data on industrial resource efficiency.
- Developing countries have a strong potential to leapfrog inefficient technologies by adopting cleaner production programmes, particularly those that provide support to smaller companies, many of which serve global value chains.

Source: UNEP 2011a

⁸⁵ The 10YFP is a global framework of action to enhance international cooperation to accelerate the shift towards Sustainable Consumption and Production in both developed and developing countries. For more information, see <http://www.unep.org/resourceefficiency/Portals/24147/scp/10yfp/document/Brochure%2010YFP%20-071212%20Final.pdf> and UNCTAD (2012).

There are many challenges facing the global manufacturing sector, particularly related to its sustainability. These include:

Resource scarcity:	Scarcity of fresh water, energy sources, minerals and metals threatens the future economic growth of many manufacturing sectors.
Resource inefficiency	Inefficient uses of scarce resources entail economic losses and accelerate resource depletion. According to the World Business Council for Sustainable Development (WBCSD), by 2050, resource efficiency will need to increase by a factor of 4 to 10 in order to meet targets for sustainable levels of resource use (EC 2011).
Pollution	Industrial facilities release greenhouse gas (GHG) emissions, particulate matter, sulphur dioxide, nitrogen dioxide, lead and chemicals. These accelerate not only climate change and atmospheric pollution, but they also degrade ecosystems and cause health risks. Manufacturing accounts for up to 17 per cent of air pollution-related health problems. Pollution also has an economic effect and incurs economic costs: Estimates of gross air pollution damage range from 1 to 5 per cent of global gross domestic product (GDP) (UNEP 2011a).
Hazardous substances and waste	Global output in the chemicals industry has grown from US\$ 170 billion in 1970 to over US\$ 4.1 trillion today, with a steady shift in the production, use and disposal of chemical products from developed countries to emerging and developing economies, where safeguards and regulations are often limited. Poisonings from industrial and agricultural chemicals are among the top five leading causes of death worldwide, contributing to over 1 million deaths annually and 14 million Disability Adjusted Life Years (UNEP 2013).
Energy consumption	The manufacturing industry accounts for about 25 per cent of global energy consumption (IEA 2011). As industrial production expands, it will put increased pressure on energy supplies.

Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication. UNEP

8.1.1 Circular Economy

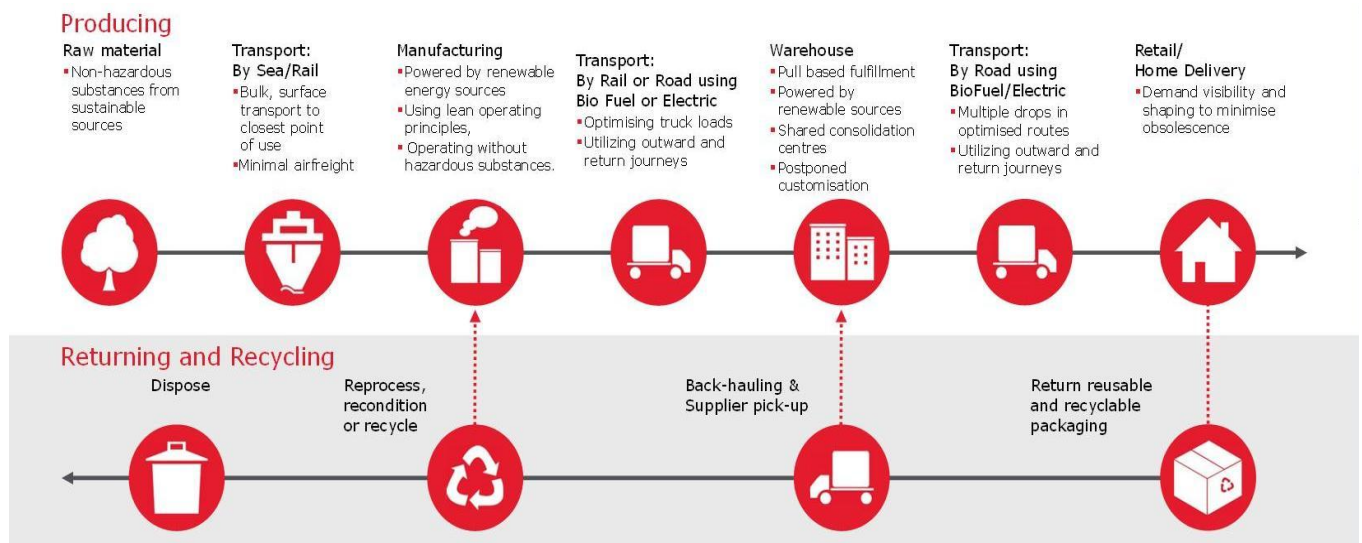
As indicated earlier on in this document (Chapter on Waste), moving towards a circular economy is at the heart of the European Union as indicated in the resource efficiency agenda established under the Europe 2020 Strategy for smart, sustainable and inclusive growth.

The circular economy is deemed to be an opportune means to tackle waste that has constantly grown since the industrial revolution “... because our economies have used a “take-make-consume and dispose” pattern of growth – a linear model which assumes that resources are abundant, available and cheap to dispose of”⁸⁶.

In this respect, green manufacturing is a core component of a circular economy able to lead to lower raw material costs, production efficiency gains, reduced environmental and occupational safety expenses, little or no waste or pollution, and improved corporate image (Atlas and Florida 1998). Increased trade in non-hazardous recyclable materials could also play a role in the circular economy by reducing the demand for raw materials and by aiding a more efficient use of increasingly scarce resources.

Green purchasing is another tool that aids in the transition to a green economy in the manufacturing sector with the International Green Purchasing Network (IGPN) defining green purchasing as “the purchase of any product and service that results in a lesser environmental impact while performing a similar function, and while demonstrating social responsibility and ethics, at its comparable price” (IGPN 2010).

Diagram illustrating a circular economy process



That said, there are still many obstacles that need to be overcome to encourage more companies to switch towards greener manufacturing processes or developing greener products. These include:

- A lack of necessary tools,
- Insufficient management commitment and skills,
- Shortage of funding, and

⁸⁶ http://ec.europa.eu/environment/circular-economy/index_en.htm

- An overall lack of awareness by both producers and consumers⁸⁷.

8.2 Small and Medium Enterprises

8.2.1 European Union Level

SMEs play a central role in the European Union with 99% of all European businesses falling within the definition of “*independent companies which have fewer than 250 employees*”. In view of this, in 2008, the European Union adopted the Small Business Act for Europe that aims to:

- Improve the overall approach to entrepreneurship,
- Permanently anchor the 'Think Small First' principle in policy making from regulation to public service, and
- Promote SMEs' growth by helping them tackle the remaining problems which hamper their development.

Successful implementation of actions linked to the Green Economy for SMEs depends amongst others on dialogue with SMEs stakeholders and the availability of dedicated financial resources to achieve its objectives. Enabling SMEs to turn environmental challenges into business opportunities is also part of the Small Business Act for Europe.

From the point of view of job creation, the growing volume of trade in environmental products is an opportunity for countries specialised in basic commodities to expand their manufacturing industries, integrate in more complex value chains and increase the value added of their products (UNEP 2008). That in turn is an opportunity to create green jobs and increase workers' skills, considering that along with extractive industries and construction, manufacturing accounts for 23 per cent of global employment (UNEP 2011a).

<http://www.unep.org/greeneconomy/Portals/88/GETReport/pdf/Chapitre%205%20Manufacturing.pdf>

8.2.2 Local perspective

SMEs play a crucial role in the Maltese economy, much more so than SMEs in most other Member States. Maltese SMEs account for 73% of value added compared to 58% in the EU. In this respect, the Government is committed to enhancing the competitiveness of SMEs and exploiting the opportunities that arise from greening the economy through the creation of more green jobs and green products.

⁸⁷ Green Economy and Trade. United Nations Environment Programme, 2013

Resource efficiency has been clearly identified as a means to increase efficiency and reduce costs, which is crucial considering SMEs scarce resources. SMEs should consequently be encouraged to complement the internal expertise with knowledge from external experts to find new solutions to be more efficient.

Furthermore, specific financial and economic measures/assistance (such as schemes or incentives) are deemed opportune to encourage and motivate local SMEs to align their operations with this greening concept. To this end the Government is committed to:-

- Creating more awareness amongst SMEs on the benefits of resource efficiency and the business opportunities generated by the Green Economy.
- Promoting energy audits leading to resource efficiency.
- Supporting SMEs through the possible introduction of tax credits, grants, training and other similar schemes.

Another aspect of importance relates to the collection of data in relation to green(er) initiatives. In recent years there have been a number of incentives/grant schemes targeting environmental measures (both directly and indirectly), yet to date, data pertaining to assistance provided to entities for environmental investments are not easily available.

8.3 Sustainable Consumption and Production

Current production and consumption patterns result in excessive and increasing exploitation of natural resources that affect the climate, the biological diversity, the natural balances and even the stability of human societies.

Rapid growth in consumption of goods and services, combined with shorter and shorter product lifetime has resulted in increased consumption of natural resources and production of waste and nuisances. In this context, the challenge is to orientate our production and consumption methods towards a more sustainable economy, which limits environmental impacts whilst improving our competitiveness, our quality of life and the social conditions of production. It goes beyond greening technologies or to those sectors linked to energy and the environment but rather, covers all activities - more especially those involving consumer products - and is found at every stage in the products' life cycle, from design to recycling after use, via their production, distribution and use.

It is therefore imperative that everyone embarks on this challenge - citizens, consumers, production companies, distributors and public authorities. Each individual's behaviour and involvement affect the success or otherwise of sustainable consumption and production requiring a shift from current lifestyle attitudes and behaviours. Altering our production and consumption methods means simultaneous action on supply and

demand, to enable harmonious growth of the most responsible products, making them more competitive than conventional offers, and to stimulate our economy.

It is important to develop and circulate eco-design methods and tools upstream, mainly to reduce resource and energy consumption and the production of waste. Simultaneously, downstream, it involves making the offer more attractive and more credible in the eyes of consumers, extending environmental (especially the carbon content) and social information on the products and services and supporting virtuous consumption behaviours.

8.3.1 Green Public Procurement

The public sector has been identified as the largest consumer in the economy, spending over €2 trillion (or €2,100 billion) on goods, services and works – equating to about 19% of the EU's gross domestic product (GDP) in 2009⁸⁸.

Over the past few years environmental issues have increasingly drawn the attention of the EU legislator. This is no different in the area of public procurement with green public procurement (GPP) proving to be a useful tool by encouraging the use of greener products and services by the public authorities. In this regard, over the past decade, the role of governments and public institutions in the achievement of public policy goals has been thoroughly reconsidered. Today, there is an increasing awareness of the fact that sustainability goals such as the production and consumption of environmentally friendly products and services can be promoted not only by regulation, but also by including environmental considerations in the daily activities of government as a purchaser of products and services.

Indeed green public procurement was introduced as part of an effort to take some concrete steps towards sustainability. As highlighted in the above data, it is important that governments take a stand towards greener procurement, particularly by taking concrete steps that can impact the outcome, influencing consumption and production patterns, and thus minimising the damage caused to the environment, while maintaining an economic equilibrium at the same time.

The European Commission defines Green Public Procurement (GPP) as "*a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life-cycle when compared to goods, services and works with the same primary function that would otherwise be procured*"⁸⁹.

Green Public Procurement concerns both:

- Contracting authorities: National, regional or local authorities and so-called

⁸⁸ DG Internal market and European Commission report of Green Public Procurement

⁸⁹ Source: Communication (COM (2008) 400) "Public procurement for a better environment"

bodies 'governed by public law'. These are bodies established for the specific purpose of meeting needs in the general interest, but without an industrial or commercial character and for the most part financed, administered or supervised by public authorities. (see Article 1 of Directive 2004/18/EC)

- Contracting entities: All entities operating in so-called 'special sectors', namely: water, energy, transport and postal services. Even if the operating entities in those sectors are not necessarily any longer public authorities or bodies governed by public law, they provide public services and remain fairly dependant on public money. They are therefore often subject to similar, albeit less restrictive, rules. (see the preamble to Directive 2004/17/EC)

A report by the European Environment Bureau – Guidance to foster green public procurement (April 2012) indicates that when public authorities decide to purchase products and services that are kinder to the environment they will not only boost production of those goods directly, but also influence the accessibility of those products and lower their price. Additionally, by purchasing green products and services public authorities provide incentives for businesses.

Against this background, the report: The uptake of green public procurement in the EU 27, submitted to the European Commission, DG Environment (2012) highlights that GPP is expected to contribute to the achievement of the goals set by the EU 2020 strategy in terms of sustainable and smart growth, especially by encouraging the development of climate-friendly technologies. The adoption of the EU 2020 Strategy is therefore likely to be coupled with an even stronger attention for the promotion of GPP among public administrations, and especially within the context of the flagship initiative on “Resource Efficient Europe⁹⁰”.

Locally, the Green Public Procurement National Action Plan Dated November 2011 recognised its importance but acknowledged that whilst some member states had achieved and exceeded this, others, including Malta, lagged behind. To this end this plan sought to map out a strategic a co-ordinated approach to Green Public Procurement.

In 2014, around 2,300 public authority tenders were screened for compliance with GPP. During the same year, in recognition of the increasing importance of the impact of public expenditure on the environment, the Government embarked on a review and comprehensive assessment of the current NAP for GPP. This, with a view to developing the second NAP for the coming three years. The review process kick started in 2015 with a target publication date of the last quarter of 2015⁹¹.

⁹⁰ THE UPTAKE OF GREEN PUBLIC PROCUREMENT IN THE EU27 - Submitted to the European Commission, DG Environment See Communication from the Commission, Europe2020. A strategy for smart, sustainable and inclusive growth, Brussels, 3.3.2010, COM(2010) 2020 final, at 15.

⁹¹ National Reform Programme. April 2015

8.4 Business/Entrepreneurial Opportunities through innovation

With the green concept becoming pretty much mainstream (particularly internationally), a number of businesses are converting a potential threat – that related to safeguarding the environment - into an opportunity utilising innovation in product processes and development of green products. In this respect, trends indicate that such endeavours generally enable such entities/entrepreneurs to charge a premium for environmental outcomes⁹².

Their move towards going green has the potential to drive innovation and stimulate a sustainable economic recovery that changes the environmentally harmful “business as usual” practices of the past. Where other people might see problems and crises, innovative green business leaders see opportunity. A wave of companies both large and small is using success in business to achieve social and environmental change. These emerging business models seek to preserve environmental quality, promote social equity, and stimulate sustainable economic growth⁹³.

Small businesses are leading in their own way, gaining media attention, securing investments, and capturing market share with innovative business solutions to environmental and social problems. Indeed, *“emerging green enterprises hold great promise for creating green-collar jobs on a large scale, for preserving the environment, and for reinventing distressed urban economies”*⁹⁴.

There are considerable opportunities in this regard, and these do not necessarily require considerable investment.

International success stories

1. Healthy Local Food Movement

Increasing concern about food safety, childhood obesity, and the green-house gas emissions associated with transporting food long distances to reach consumers creates an opportunity for organizations offering healthy food grown locally without the chemicals and pesticides that can damage human and environmental health. Starting such an enterprise is a great way to support the local economy, promote community health, and reduce greenhouse gas emissions. Urban farms and gardens also provide much-needed safe, outdoor areas for kids to play and interact with nature. Potential opportunities include:

Urban farm or garden⁹⁴;

Local grocery store or cooperative⁹⁵;

⁹² www.pewtrusts.org/news_room_detail.aspx?id=53254

⁹³ Ten Green Business Ideas for New Entrepreneurs. Green for All

⁹⁴ Spin Farming offers additional resources: <http://www.spinfarming.com> ; www.cityslickerfarms.org/

Organic restaurant or catering service⁹⁶

Garden Training – teaching basic gardening skills to adults and youth so they can grow their own healthy food.

2. Renewable Energy Alternatives, Green Collar Job Training and Green Business Incubators

To curb global warming, we need to reduce our consumption of fossil fuels and turn instead to alternative, renewable sources of energy. Emerging entrepreneurs can take advantage of this opportunity in a number of ways:

Solar Insulation: Install solar panels or solar water heaters;

Job Training⁹⁷: Whether as a for-profit business or a non-profit organization, train low-income residents to be the green-collar workers of the future

Green-Business Incubator⁹⁸: Support- first-time entrepreneurs aiming to solve environmental and social problems in their communities;

3. Green Transportation

Starting a business that offers alternative transportation solutions can benefit both the environment and community health. You can do this in any number of ways, from something as simple as fixing up old bikes to something more ambitious like starting up a green cab company in your city.

Electric Bike and Scooter Dealership⁹⁹;

Refurbishing Bicycles: Refurbish and sell used bikes¹⁰⁰;

Community Bike-Share Program¹⁰¹;

Green Cab Company: Use hybrid vehicles to help people get where they're going;

Car-Sharing Programme¹⁰²;

⁹⁵ <http://oklahomafood.coop>

⁹⁶ <http://www.organiccatering.com/>

⁹⁷ <http://veteransgreenjobs.org>

⁹⁸ <http://greenworker.coop>

⁹⁹ Additional information on electric bikes and scooters for resale: <http://www.electric-bikes.com>

¹⁰⁰ <http://bikes4life.com/>

¹⁰¹ International Bike Fund resources for community bike share programs:

<http://www.ibike.org/encouragement/freebike.htm>

¹⁰² Guide to starting a car-sharing program: http://www.citycarshare.org/download/CCS_BCCtYC_Long.pdf

4. Green Product Innovation and Consumer Goods Retail

Consumers are becoming more aware of the health and environmental impacts of the products they use every day. Demand for safe, effective, non-toxic products that do not harm the environment is steadily growing. Opportunities abound for innovative entrepreneurs to meet this demand.

Online Retail¹⁰³: Take advantage of a growing market by selling goods online, such as sustainable baby goods or green home and bath products..

Natural Make-Up and Body Care¹⁰⁴: Market all-natural make-up and body care products, made from organic ingredients and not tested on animals..

Green Everyday Products: Develop daily-use products that help consumers cut their greenhouse gas emissions, minimize waste and reduce their exposure to toxins. Example: reusable water bottles, biodegradable containers, biodegradable trash bags

5. Become Part of the ReUse Revolution

Recycling is a great alternative to throwing things away, but reusing materials is even bet-ter. Making new consumer goods from landfill-bound materials reduces waste, preserves space in overflowing landfills, and curbs global warming. Remaking consumer goods (also called upcycling) is also becoming hip as entrepreneurs find ways to make fashion statements with recycled clothing and salvaged furniture. And a niche market is growing within the construction industry for used building materials.

Salvage¹⁰⁵: Become a salvage expert, removing, selling, and installing used building materials for a profit.

Furniture¹⁰⁶: Make furniture out of scrap materials, or refurbish old furniture to be sold as improved.

Clothes¹⁰⁷: Design and produce clothes from recycled or used fabrics.

¹⁰³ www.blackenergy.com

¹⁰⁴ www.beelinestore.com/index.html

¹⁰⁵ The ReUse People in Oakland, CA offer demolition training and certification for used building materials: <http://thereuse-people.org/>

¹⁰⁶ www.heritagesalvage.com

¹⁰⁷ Article: <http://earth911.com/blog/2009/07/13/recycled-clothing-remade-to-last/> ; <http://www.ekologic.com/>

6. Energy-Efficient Homes and Green Building Retrofits

Constructing and operating buildings take an environmental toll, requiring large amounts of raw materials and water. By bringing existing buildings up to current standards, one can avoid constructing new buildings, drastically reducing raw materials consumption and greenhouse gas emissions.

Those with backgrounds in construction, roofing, electrical engineering, or architecture have a range of opportunities to start new businesses in the booming green building and energy-efficiency fields. Those with little or no experience have the chance to gain skills and create their own career opportunities.

Energy Audits¹⁰⁸: Offer energy audits that help homeowners and businesses improve energy efficiency and save money on their utility bills.

Green Retrofits: Perform energy-efficiency and green building retrofits (e.g., weatherization, solar panel installation and solar thermal installation) to help building owners reduce their energy consumption and greenhouse gas emissions while increasing the value of their property.

Cool Roofing¹⁰⁹: Install cool roofs, made from materials that reflect the sun's heat instead of allowing a building to absorb that heat. Cool roofs increase energy efficiency and reduce the heat-island effect in urban areas. Cool roof installations comply with green building codes and reduce greenhouse gas emissions..

Green Roofing¹¹⁰: Install green roofs (or "living roofs") covered with vegetation and soil. Green roofs have many environmental and energy-efficiency benefits, helping reduce urban air temperatures, providing building insulation, and creating habitat for wildlife.

7. Green landscaping and Green Plumbing

People with backgrounds in plumbing or landscaping are in high demand as buildings look to conserve water and reduce their energy consumption

Green Landscaping¹¹¹: Help property owners protect the environment, conserve water, and have beautiful gardens.

Native-Plant Nursery: Grow and sell drought-resistant native plants in your

¹⁰⁸ For additional information and training:

http://www.businessweek.com/investor/content/dec2005/pi2005121_4811_pi001.htm; Home energy audit training: <http://www.alternate-energy-sources.com/home-energy-audit.html>; <http://denbyenergy.com/program-comparison>

¹⁰⁹ The Cool Roofing Council provides information on industry products: <http://www.coolroofs.org/>

¹¹⁰ Green Roofs for Healthy Cities provides green roof information and accreditation:

<http://www.greenroofs.org/index.php/eduprogram>; See also: <http://www.dcgreenworks.org>

¹¹¹ www.middlebrook-gardens.com

community.

Green Plumbing¹¹²: Install tankless water heaters, low-flow toilets, and passive solar water heating systems in client buildings..

Green Plumbing Retail: Become a retailer of and advocate for low-flow, water-efficient toilets, tankless water heaters, and passive solar water heaters in your community.

Source: Abstracts taken from: Ten Green Business Ideas for New Entrepreneurs. Green For All

8.5 Action areas for consideration

- Support the green economy and business innovation

Innovation must be encouraged to boost the competitiveness of increasingly environmentally-friendly techniques and organisations. The same applies to the design of products and services which improve the environment and decarbonise the economy. In all circumstances, innovation in services and organisations is a driving force in developing new economic models, including the green growth model.

An example of this is the emergence of an economy of functionality, replacing the marketing of goods by marketing their use, or industrial ecology, focusing on environmental optimisation at the scale of groups of businesses, sectors and regions.

- Develop a more sustainable agri-food production

The significance of food impacts on consumer health merits special attention, to introduce a more sustainable perspective into our agri-food production and consumption methods: more environmentally – and employee - friendly production and distribution, reduced transport-related impact and better consumer information on the environmental and social quality of products.

- Incentives to purchase and consume sustainably
 - Expanding information displayed on the products and in the points of sale: displaying the carbon content and other impacts of product, displaying health information, displaying social conditions of production and ecolabels;

¹¹² Green Plumbers USA offers training and certification programs: <http://www.greenplumbersusa.com>

- Guiding corporate purchasing policies and individual choices towards more favourable products in terms of environmental impacts and social conditions of production;
- Promoting certifications and best use practices;
- Promoting successes due to exemplary eco-design initiatives;
- Placing/revising the tax on polluting activities to products generating a great deal of waste and strengthening its incentive nature by matching its rates to the costs of environmental damage caused.
- Reducing waste production and improving recycling rates:
 - Encouraging savings in raw materials and recycling through incentive pricing and taxation and local prevention plans;
 - Inciting the development of eco-design and the recycling of packaging and construction waste;
 - Developing vocational training for employees in the recycling and repair-recovery sector;
 - Encouraging activities combining recycling, re-use and solidarity objectives.
- Further promotion of standards and accreditation
 - Standards and accreditation have a role to play in driving growth and jobs in the Green Economy. Recognised as a badge of excellence, standards and accreditation can drive innovation in products and services while providing leverage for sales and growth in the Green Economy.

8.6 Upcoming Endeavours

The implementation of Green Public Procurement in Malta was formalised in 2011 through the publication of the first GPP National Action Plan (NAP). It has been recognised that in order to reinvigorate and strengthen the GPP process in Malta an inter-ministerial GPP Task Force (IMTF) lead by MSDEC and with representation from all ministries ought to be established with the remit of undertaking a comprehensive review of the first NAP with a view to developing the 2nd NAP until 2018. Additionally, water efficiency issues within the industrial sector will be tackled in the framework of national water conservation campaign and the national water management plan.

8.7 Proposed Actions

42. Green Public Procurement

- By end 2016: Re-evaluate the current green public procurement National Action Plan and set the target of 75% of all public procurement being compliant with “EU

common core GPP criteria". It is imperative that all Government officials/employees involved in procurement processes are well acquainted to the newly proposed criteria/targets and that these become mandatory across all Government entities.

In line with the above, the evaluation would need to also take into account the comprehensive criteria identified by the EU and devise a plan for their gradual adoption over the coming years.

43. Green Business Models

Create a permanent eco, pro-biodiversity business research facility in a manner that develops and promotes green business models for micro, small and medium-sized enterprises with the models focusing initially on resource use efficiency, waste reduction, and the building of enterprise capability that enables them to adapt and adopt new technologies. Furthermore in line with EU's move to integrate pro-biodiversity at a business level, such model is to be in sync with endeavours undertaken by the EU through the European Business and Biodiversity (B@B) Platform. This Measure necessitates close collaboration between the Centre for Entrepreneurship and Business Incubation within the University of Malta, Malta Industrial Parks, Malta Enterprise and the Malta Business Bureau¹¹³.

- By year end 2016: Review of the existing industrial estate management mechanisms including land usage protocols that make more efficient and effective use of available estates;
- By year end 2017: Identify/ develop investment support schemes geared at:
 - identifying best of breed '*clean technology*' and '*eco-technology*' solutions; and
 - promoting and incentivising the adoption of best of breed solutions.

44. Environment Hub

In view of limited awareness on the economic potential of 'going green' in both the

¹¹³ Such facility could be integrated with the Centre for Entrepreneurship and Business Incubation within the University of Malta. Such entity should form strong links with Malta Industrial Parks (entity that should be responsible for the actual identification of 'green' sites and the respective estate management of new or existing buildings in order to ensure more efficient and effective use of land resources). On the other hand, Malta Enterprise would be responsible for the promotion of green business models and the development of schemes incentivising greener processes. It is also being suggested that discussions be extended with the Malta Business Bureau in order to obtain vital feedback from the private sector before any new measures are formally proposed.

industrial as well as the domestic environment coupled with the general association that ‘green initiatives’ are good for the environment but normally lead to higher costs¹¹⁴ it is being proposed that a **one-stop shop** be created for information dissemination and the development of promotion and advisory schemes associated with Renewable Energy Supplies, Water Usage/management and Energy Efficiency and other sustainable development related efforts as a means with which to assist consumers in taking sustainable decisions that contribute to the greening of the economy.

Whilst focusing on the environmental dimension is positive, this is not enough to constitute a viable selling proposition that households can identify with and this measure aims to ensure that sufficient visibility is given to the economic benefits.

The Environmental hub would undertake:

- A. Model residential and commercial developments in partnership with the private sector; and
- B. Model retrofits of older properties that demonstrate how such older properties can be rendered more economically viable through green technology.

The programme would also act as a one-stop shop that provides relevant information that contributes to the development and promotion of advisory schemes associated with Renewable Energy Supplies as a means with which to assist consumers in taking sustainable decisions that contribute to the greening of the economy. (Endeavours in this regard are to dovetail with measures in the energy and climate change policies and plans, as well as the air quality plan.)

The programme will be specifically geared at providing the means with which to clearly enable consumers to realistically benchmark individual green components against their conventional counterparts. This must include on-going energy survey(s) that compare the spending of green household’s vs those of conventional ones in a manner that identifies financial savings and structured within the context of a self-help mechanism possibly supported with Government financing for those that are socially disadvantaged and who may otherwise be left out for want of the initial capital outlay.

- By mid-2017: An environment hub be set up to develop demand side management capabilities that enable and empower households and businesses to identify, design and implement capital investment measures and/or modifications to existing plant and equipment that reduce the cost of owning and operating energy driven systems and equipment and other potential sustainable initiatives.

This measure is to require close collaboration between University/ MCAST/ MEPA/ MCST/ SEWCU, CEBI, MRA and ME¹¹⁵.

¹¹⁴ and building on Pilot Project 3 of the National Environment Policy

¹¹⁵ This is to be incorporated to CEBI with the involvement of the University/MCAST/MEPA/MCST/SEWCU with the aim of providing solutions and new technologies in the fields of environment management and energy

Re data/research, please review Measures indicated under the Energy (and water) pillars relating to data/research.

45. Green Borrowing (Financing)

- By year end 2016: Creation of green finance mechanisms that would incentivise industry to move towards green carbon neutral development in general. This measure is to rope in with the Agriculture Measure on Green Finance, whereby banks will be enticed to issue a call (identical to the Jeremie scheme) specifically for green investments. Through this measure the entire development would be eligible for green finance given it subscribes to pre-established criteria and the developer binds himself to develop these along such criteria through the planning process.

46. Green Bonds

The availability of ethical and green investment mechanisms on the local market is limited.

- By year end 2017: Create the necessary structures and protocols for the issuing of Green Bonds by the private sector comprising the creation of an evaluation mechanism that certifies a bond or other investment instrument as green.

conservation; with the marketing falling within the remit of Marketing Department of the Malta Resources Authority (MRA). Malta Enterprise would be responsible for the formulation and introduction of schemes.

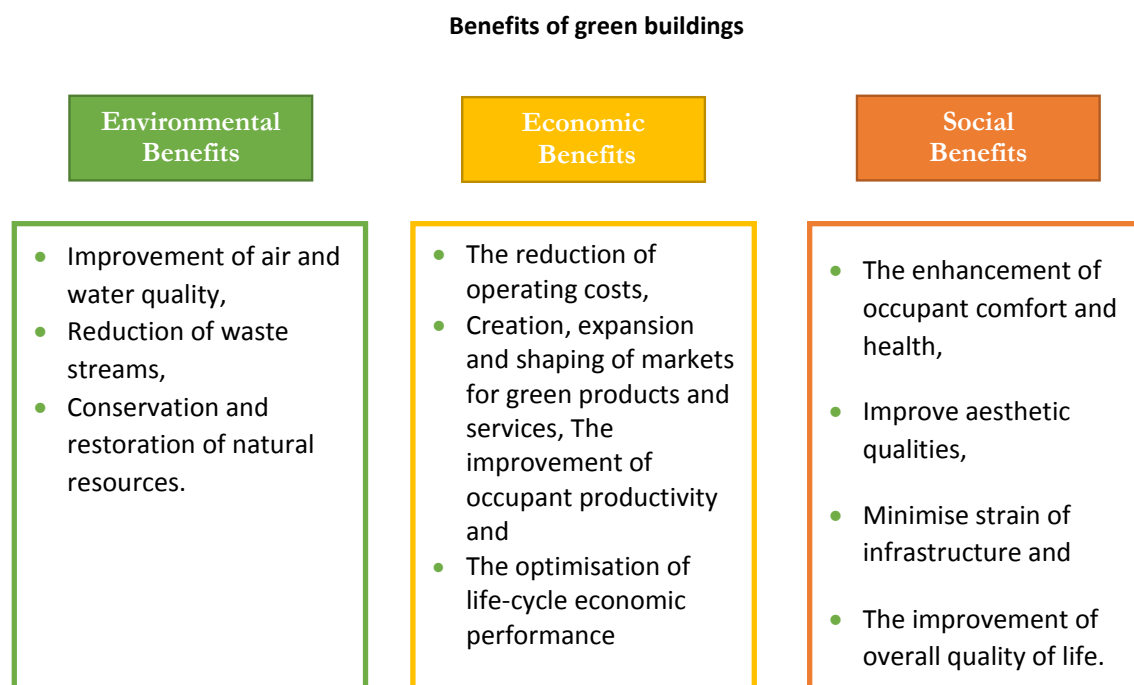
9. CONSTRUCTION

9.1 Construction Competitiveness

The construction sector plays an extremely important role in the European economy, generating 6,3% of GDP (this figure reaches almost 10% if construction product manufacturers, architects, engineers and others involved are also considered) and providing 20 million jobs, mainly in micro and small enterprises¹¹⁶.

Apart from influencing the development of the overall economy this industry also affects the natural environment¹¹⁷. The energy performance of buildings and resource efficiency in manufacturing, transport and the use of products for the construction of buildings and infrastructures invariably impacts on individuals' quality of life.

The competitiveness of construction companies is therefore an important issue not only for growth and employment in general but also to ensure the sustainability of the sector. Striking the right balance between developments and conserving the environment is a continuous challenge. In this respect, green buildings may significantly influence the environment, human health, and the economy, with the successful adoption of green building strategies able to maximize the social, economic and environmental performance of buildings¹¹⁸.



¹¹⁶ http://europa.eu/rapid/press-release_MEMO-12-431_en.htm?locale=en

¹¹⁷ World Green Building Council. Europe | Regional Network

¹¹⁸ Malta Chamber's Energy and Environment Committee Chairman and CEO of QP Management, Perit David Xuereb. <http://www.mbb.org.mt/Articles/>

Source: Malta Chamber's Energy and Environment Committee Chairman and CEO of QP Management, Perit David Xuereb. Quote taken from MBB article 'Setting sight on Green Building'. <http://www.mbb.org.mt/Articles/Article.aspx?Section=newsroom&ArticleId=3947&Article=Setting+sight+on+Green+Buildings>

Internationally, policy and mechanisms in this sector are all the more shifting to make green buildings more attractive, be it with respect to sales and rental premiums, which help reduce capital expenditure and/or mitigate the risk of regulation requiring costly alterations to buildings.

At both European and local level, emphasis is placed on governments to lead by example. The power of strong public sector leadership on green building is not just about helping lead the wider market. Green building can lower the cost of running public buildings, increase the efficiency of service delivery and help create the right environment to retain and foster the brightest talent.

Advantage of a Green building

Advantage of a Green building	
Takes an intelligent approach to energy	<ul style="list-style-type: none"> Minimising energy use in all stages of a building's life-cycle, making new and renovated buildings more comfortable, less expensive to run and helping building users learn to be efficient too. Integrating renewable and low carbon technologies to supply buildings' energy needs, once design has maximised inbuilt and natural efficiencies.
Safeguards our water resources	<ul style="list-style-type: none"> Exploring ways to improve drinking and waste water efficiency and management, harvesting water for safe indoor use in innovative ways and generally minimising water use in the sector. Considering the impact of the built environment on storm-water and drainage infrastructure, ensuring these are not put under undue stress or prevented from doing their job.
Minimises waste and maximises reuse	<ul style="list-style-type: none"> Using fewer, more durable materials and generating less waste, as well as accounting for a building's end of life stage by designing for demolition waste recovery and reuse. Engaging building users in reuse and recycling.
Promotes health and well-being	<ul style="list-style-type: none"> Bringing a breath of fresh air inside, delivering high indoor air quality through good ventilation and avoiding materials and chemicals that create harmful emissions. Incorporating natural light and views to ensure building

	<p>users' comfort and enjoyment of their surroundings, reducing lighting energy needs in the process.</p> <ul style="list-style-type: none"> • Designing for ears as well as eyes. In the education, health and residential sectors, acoustics and proper sound insulation play important roles in helping concentration, recuperation, and peaceful enjoyment of property. • Ensuring people are comfortable in their everyday environments, creating the right indoor temperature as the seasons pass through passive design or building management and monitoring systems.
Keeps our landscape green	<ul style="list-style-type: none"> • Recognising that our urban environment should preserve nature, ensuring diverse wildlife and land quality are protected or enhanced, for example by remediating and building on polluted land or creating green spaces. • Looking for ways we can make our urban areas more productive, bringing agriculture into our cities.
Creates resilient and flexible structures	<ul style="list-style-type: none"> • Adapting to a changing environment, ensuring resilience to events such as flooding, earthquakes or fires so that our buildings stand the test of time and keep people and their belongings safe. • Designing flexible and dynamic spaces, anticipating changes in their use over time and avoiding the need to demolish and rebuild or significantly renovate buildings to prevent them becoming obsolete.
<p>Source: What is green building and why does it matter? World green Building Council. Europe Regional Network</p>	

That said, moving towards green buildings is not without its difficulties:

- Many of the changes required can involve disruption and costs;
- Reducing emissions is not seen as a strategic priority for many organisations, with most (both businesses and public sector organisations) not yet understanding how and to what extent they need to change;
- In view of the considerable variances in the age and condition of buildings, a 'one-size-fits-all' approach is not possible, hence a variety of solutions are needed;
- There exist other issues for people living in rented accommodation particularly those who are not able to make changes to the property.

Building zero carbon homes will require substantial change on the part of house builders and their suppliers. As people and businesses, as well as public entities embrace a move

to a green(er) building (possibly through a ‘whole house’ approach¹¹⁹) supplying the materials and installing the energy saving measures into such premises will be a big task and an employment and economic opportunity for the green building sector and its supply chain over the medium term.

Modernising buildings (making them greener) will not in itself be enough – we will also need to change our habits. Energy and resource use is not very visible and most of us have little idea of how much energy we use for different things. It is not always easy for people to see how small individual actions can make a difference.

The UK Low Carbon Transition Plan, HM Government

9.2 The local perspective

The construction sector in Malta constitutes around 6% of total employment¹²⁰ and thus represents an important sector of the economy.

In recent years, action to increase the uptake of renewable energy infrastructure in Government buildings coupled with incentives to finance the installation of renewable energy infrastructure within the domestic sphere is considered to have led to a significant contribution towards a shift in increasing awareness on renewable energy systems and the need for mitigation action, though more still needs to be done.

Malta is committed to make significant reductions in its energy consumption. It is recognised that to achieve this a new approach towards the construction of new buildings as well as retrofitting activities must be implemented. This means that those working in or entering the construction sector will require new knowledge, skills and competences to achieve the required standards.

Green buildings are not only about energy efficiency. Green buildings should also result in considerable savings in the use of water. The efficient use of water is increasingly becoming a priority for Malta as potable fresh water sources become scarcer and the production through desalination is, so far, very energy intensive.

¹¹⁹ A ‘whole house’ approach means considering a household’s energy needs and carbon dioxide impacts as a whole, and establishing a comprehensive package of measures to address them. The aim would be to include all the measures available that are suitable for a property and which could pay back through energy bill savings over their lifetime. This should result in a coordinated package, which will also include renewable energy measures where appropriate to the property.

A key benefit of the ‘whole house’ approach is that it ensures that the needs of the property are assessed as a whole, that they happen in the right order, and that disruption is minimised.

Engaging the Public with Climate Change: Behaviour Change and Communication; Lorraine Whitmarsh, Irene Lorenzoni, Saffron O'Neill

¹²⁰ National Statistics Office Malta (NSO) Labour Force Survey Q1 2015

In the face of a potential water crisis, the building industry in Malta continues to ignore this reality. Not only is there rarely a provision for the re-use of grey water, but household functions such as sanitary needs continue to use first class drinking water. Creating green buildings will require the installation of water supply systems that service different functions separately allowing for a much reduced use of drinking water while enabling the use of grey water for most of the household management functions. This infrastructure will also need to be complemented by the use of water efficient appliances, which on their own could result in water savings of up to 50% for some¹²¹.

9.2.1 Buildings and Waste

Construction waste is a major contributor to the solid waste volumes generated in Malta where an estimated 84% of solid waste comes from this sector¹²². This is more than double the estimated 40% generated in developed countries. Given the limited landfill area available to the country, (and the fact that such mineral is a scarce resource) it is clear that gains in the reduction of construction waste would be considerably beneficial while not being generally technically complex or costly.

9.3 Action areas for consideration

- Make people more informed on the benefits of green buildings – be it through a dedicated telephone line, online portal or through Local Councils. Information and advice is just as important as setting targets and helps one think about reducing emissions.
- Linked with the above is the opportunity to create demonstration sites across the public sector estate and in major public buildings.
- Offering more support for people wanting to know how to generate their own low carbon energy. This could comprise:
 - Providing a household the opportunity to undertake an audit (at a subsidised cost) for a thorough home energy audit, and a personal carbon reduction plan showing the energy saving steps to take, and their costs and savings potential;
 - Developing a Grant Information Database to help people to find out about the funding offers available;
 - Finding ways to make it easier for people to find builders and tradespeople with the right energy efficiency competencies.
- Introduce or strengthen new finance offers and different forms of financial support to help people meet the costs of transformation for home energy improvements and payment for low carbon energy. Such a scheme could

¹²¹ Water efficiency saves energy. Reducing Global Warming Pollution through Water Use Strategies. www.nrdc.org/policy

¹²² Solid Waste Management Strateg. Ministry for Resources and Rural Affairs (MRRA). 2009

incorporate 'pay as you go models' to help people to be able to meet the costs of transforming their homes to the best efficiency standards. This will spread the upfront costs into the future whereby the costs of improvements would be offset by energy bill savings.

- Place Energy Performance Certificate (EPC) ratings for all rented properties alongside particulars of property advertisements, so that potential tenants know more about energy performance from an early stage.
- Placing regulatory measures in place that will progressively phase out the use of incandescent lighting for general domestic and commercial use including in public buildings.
- Further exploitation of solar energy both at industrial and residential level.
- Creating a system that actively promotes energy efficient technologies and know-how of retrofitting among both companies and households.
- Additional rewards and incentives for saving energy.
- Further assist employees develop new skills (related to sustainability/eco/pro-biodiversity).

9.4 Upcoming Endeavours

- Malta has already suggested targets for the revision of the minimum requirements of energy performance of buildings in the National Energy Efficiency Action Plan (NEEAP). These targets will affect new and refurbished buildings. The Building Regulation Office (BRO), on behalf of the Building Regulation Board (BRB) is undertaking (commissioning) cost-optimal studies on the existing national minimum requirements. The same studies will analyse and recommend the best and most appropriate upgrades of the same requirements as required by the Recast EPBD 2010/31/EU which have to take place over a number of years. The revision of the minimum requirements is legally cast in LN 376 of 2012. The results derived thereof will also feed the roadmap in the National Energy Efficiency Action Plan (NEEAP).
- Action Plan for Progression to Nearly Zero Energy Buildings (NZEB). The Energy Performance of Buildings Directive requires all new buildings to be nearly zero-energy by the end of 2020. All new public buildings must be nearly zero-energy by 2018 and all new buildings by 2020.
- Government, the Building Regulation Board and the Building Regulation Office amongst others shall draw up the National Energy Efficiency Action Plan (NEEAP) and other national plans in order to increase the number of nearly zero-energy buildings and measures concerning the use of energy from renewable sources in new buildings and existing buildings undergoing major renovation.
- Malta plans to compile an inventory of central government buildings as required by Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC. (The data will be collected through a memorandum which will be sent to all Government

Departments requesting plans, areas and energy performance of the buildings they occupy).

9.5 Proposed Actions

47. Green Buildings

- By year end 2016: Develop ‘green building’ protocols (that are congruent with protocols pertaining to certification of buildings), with mandatory minimum as well as additional optional green protocols being specified.
- A. Suggested Mandatory – this would reflect the current minimum which would remain mandatory but enforced more rigorously through the existing compliance certification process.
 - i. Re-evaluation of current legislative requirements on wells and cisterns in domestic/commercial apartments to ensure that:
 - a. these requirements are proportionate to the size of the development;
 - b. reflect the continuous use function of the well as opposed to the traditional fall-back or carrying-over function.
 - ii. Establishment of the necessary administrative capacity to ensure the effective implementation of this legislation.
 - iii. Provide the necessary training to be able to carry out assessments to compliance.
- B. Suggested Optional – optional green protocols would be developed in relation to:
 - Use of water efficient fixtures and appliances to reduce black water;
 - Green Roofs / gardens (in conjunction with the University of Malta¹²³ (and
 - Design with particular reference to floor heights and apertures.

49. Pricing & grading the Maltese limestone at its real cost

Maltese stone is a precious resource the supply of which is running out. Unfortunately the current price of this resource does not reflect its finite supply and the cost to the environment to extract it. Given the current situation, this resource is not being used in the most efficient manner possible and is often misused. If the price of this resource is such that it reflects its real cost (both direct and indirect) then a more careful use of the Maltese stone is likely to take place. This in turn would allow quarry owners to invest in newer technologies and to undertake environmental measures to reduce their environmental impact, especially those incentives which in this sense are introduced through planning regulations.

¹²³ The UoM is participating in the LifeMedGreenRoof project (LIFE12 ENV/MT/000732; project duration: 01-JUL-2013 to 31-JUL-2017). The project expects inter alia to identify local materials adequate as growing media and identify suitable native plants;

- Year end 2016: Determine the most opportune pricing mechanism to implement with such pricing to become effective as from 2017. (Economic instruments that may be used include (but are not limited to: a raw material tax, or an environmental fee associated with the planning permit).
- Year end 2016: To further reduce the inefficient use of good-quality Malta Stone, a system of grading of all Malta Stone that is quarried is required. This will allow for a differentiated pricing strategy to be adopted whereby the high quality stone will command a top price while the lower quality stone will command a lesser price. This will assist in efforts aimed at ensuring that this resource is not used in a wasteful manner.

49. Tiered Building Development Environmental Fees

- By year end 2016: This measure is linked to Measure 44 above. On the basis of the green building protocols proposed above, introduce a tiered system of environmental instruments whereby developments that respect the additional optional criteria benefit from a low tiered structure of environmental fees with a higher environmental fee for the others. Such fee will be incorporated as part of the MEPA compliance process. This environmental fee is to be linked to certification.

It is further proposed that this 2 tiered system would operate for a limited period of time to facilitate the transition to green(er) buildings but then would be removed and all building protocols under Measure 44 become mandatory following a 3 year time span.

50. Reducing Carbon Footprint of Buildings

EU policy requires that new government buildings be carbon neutral by 2018, and that all new buildings be carbon neutral by 2020.

- By year end 2016: Green building label scheme be reviewed in a manner that is aligned to an improved framework for carbon neutral buildings that would add value to the property (both commercial & residential). (Alternatively Malta could adopt an already established international label such as LEED, or BREEAM)
- By year end 2018: All buildings occupied by public authorities become carbon neutral.
- By 2020 All other new buildings and re-development buildings be carbon neutral with quantitative intermediate targets as outlined in the table below.

Year	2014	2015	2016	2017	2018	2019	2020	Total
New Build	890	890	890	890	890	890	900	6,240

%	0	10	20	30	60	80	100	
No of NZEB	0	89	178	267	534	712	900	2,680

Year	2014	2015	2016	2017	2018	2019	2020	Total
Re-development	940	940	940	940	940	940	940	6,760
%	0	10	20	30	60	80	100	
No of NZEB	0	94	188	282	564	752	940	2,820

51. Rendering Public Buildings Carbon Neutral

- By year end 2016: Review of all existing public buildings and draw up a 'greening' implementation framework through which Government leads by example on the development of mechanisms with which to reduce its carbon footprint specifically through:
 - Insulation including apertures;
 - Water harvesting and re-use of waste water;
 - Lighting;
 - Efficient heating/cooling systems;
 - Generating energy from renewables.

This review is to incorporate:

- A. The rollout of PV systems in public buildings (this has already commenced) with all Government buildings that have utilisable space for such purposes will be fitted with localised PV systems.
- B. The renovation of schools through PV installations, energy efficient lighting, and insulation; and
- C. The deep energy and resource retrofitting of a number of healthcare institutions including the installation of 2nd class water systems, the elimination of light fuel oil heating systems and their replacement with more efficient gas burning systems supported with PV generating capabilities; energy efficient lighting; and insulation.

52. Energy needs of all detached villas to come from renewable energy generation

Detached villas present some of the best opportunities for the generation of renewable energy via solar panels or other renewable energy technology.

- By year end 2016: Carry out a study to determine the current state of current villas on the Maltese islands with respect to the utilisation of renewable energy

and subsequently draw up short to medium term strategy for the introduction/ utilisation of renewable energy generation for both existent and new villas.

53. Solar rights

Introduce the concept of solar rights as a people's right and implement measures aimed at more efficient energy use, even to combat the impact of climate change.

- By year end 2016: draw up a working group to draw up a white paper on the solar rights act.

10. DRIVERS OF GREEN GROWTH

Due to the mounting environmental challenges and the current economic situation worldwide, governments are increasingly seeking more innovative ways to promote economic activity and enhance sustainability. In this respect the OECD Report¹²⁴ highlights that *“Increasing the development and uptake of more radical and systemic eco-innovations, including new business models, is therefore important for the long-term transformation towards a greener economy”*.

Nonetheless, the same report highlights that the development of new business models is affected by a range of existent barriers, thus requiring policy action to be taken in key areas that comprise:

- Strengthening market demand for green products and services by providing long-term and stable incentives for firms to internalise the environment and natural resources in their decision making, including through a well-designed regulatory framework and supportive demand-side policies.
- Enhancing access to financing, including risk capital, by supporting market development for risk financing and the development of entrepreneurial skills.
- Removing perverse subsidies support for existing business models and incumbent firms, such as energy subsidies; reducing the barriers to entry, exit and growth of new firms and business models; and improving the regulatory environment for start-up firms and new business models.
- Reducing the costs of intellectual property rights, in particular for small and start-up firms.
- Supporting skills development, including for existing workers.
- Supporting R&D and innovation, including testing, demonstration and verification.
- Improving governance, to ensure that national and regional policies for green growth are well aligned.

In this respect, innovation (particularly in view of the strong link emerging between eco-innovation and resource efficiency) and environmental fiscal reforms are deemed to be key to such shift.

One of the challenges for environment and climate policies is their long-term perspective as compared with the relatively short-term challenges and requirements of economic and social policies. For instance, the creation of new jobs or dealing with social inequalities has a short-term perspective as immediate action and results are expected by society. This short-term thinking is not only found in politics but also regularly in business as well as in society more broadly.

¹²⁴ Why New Business Models Matter for Green Growth – OECD Green Growth papers 2013

There are a number of innovative models that have been launched successfully internationally (some of which have been identified here below), that could be considered locally. When it comes to such business models it is clearly not a case of 'one-size fits all' and consequently due diligence ought to be carried out to identify the schemes that are more appropriate for the local economy.

"Pay as you save" scheme

A potential opportunity exists to introduce a "pay as you save" scheme. Such a scheme has proved successful as it eliminates the burden (among both the general public and businesses) by enabling entities/household to borrow money to go green, with such loan then paid back through the savings resulting thereof from the energy bills. (The 'Pay As You Save' scheme would allow the upfront cost of energy efficiency measures to be paid for with ongoing savings from reduced energy bills.)

Economic instruments, such as environmental fiscal instruments and emission trading schemes

These are policy tools that can change pricing systems, which is essential for triggering the resource-efficient green economy transformation process. In its study of environmental fiscal instruments, the OECD concluded that environmental fiscal instruments are an important part of fiscal consolidation programmes from an efficiency and revenue-raising perspective (OECD, 2012).

Closely linked, and a pre-condition of environmental fiscal instruments, is the reform and phasing-out of environmentally harmful subsidies.

That said, a number of entities fear that environmental and especially energy and carbon fiscal instruments can impair the competitiveness of domestic industries. This is all the more so for entities locally.

It is therefore important that these entities take the opportunity presented by the recent cut on energy bills to invest part of the resulting savings in energy efficiency measures and renewable technology to secure their long term sustainability and reliance on fossil fuels. A means to offset the possible negative impacts from such fiscal instruments is to use the revenues derived thereof to provide investment incentives aimed at stimulating innovation in resource productivity. Such efforts often comprise/d funding opportunities. The main issues in this respect

relate to:

- Small enterprises not being aware of funding opportunities and/or
- Businesses finding the application processes far too cumbersome.

There is consequently an opportunity to tap into the above indicated issues thereby enabling more small entities to successfully tap into opportunities that make them more efficient and effective in safeguarding the environment.

Realising the benefits of environmental taxation greatly depends on the design of the particular taxation policies. The environmental fiscal policy framework must integrate demands from other policy areas, in particular economic policies in order to achieve the dual objectives of economic and environmental policies by taking into account social inclusiveness. Otherwise shortcomings of environmental taxes may prevail such as: a loss of competitiveness of domestic industry compared to foreign competitors (Ekins and Speck, 1999 and 2012) and regressive impacts that disadvantage the poor (EEA, 2011a).

In order to ensure that they remain competitive in the medium term, with the likely advent of further environmental fiscal instruments (particularly carbon pricing) companies are internally increasingly using an internal carbon price (CDP, 2013) or shadow carbon price (Sustainable Prosperity, 2013) as part of their business strategies (The internal carbon price in corporate business strategies ranges from USD 6–60 per tonne of CO₂ equivalent (85) (CDP, 2013)). The internal carbon price is a notional price set by a company on their carbon emissions. Companies often set an internal carbon price on their activities in order to anticipate future regulatory action, and ensure that their activities will still be economically viable if regulation drives carbon prices higher.

**Instruments
implemented by
hybrid players**

Instruments implemented by hybrid players also have potential. Selectivity in funding based on sustainability criteria, such as from socially responsible investments, can also be a powerful mechanism in a competitive financial market for re-directing

resources.

Securitisation is the financial practice of pooling various types of debt and selling the corresponding 'consolidated debt' in the form of bonds, various forms of securities and obligations to various investors. Such securities, if of sufficient size, offer liquid investment opportunities in asset classes in which institutional investors do not invest directly, such as SMEs and mortgages. After the crisis, the market for securitisation in Europe almost collapsed, but it is now recovering. Securitisation is beneficial both for banks and for investors, freeing liquid resources which can be mobilised for green economy investment.

Crowd-funding is another financial innovation with high potential. This is an emerging alternative form of financing which connects those who can give, lend or invest money directly with those who need financing. Promoters of an initiative can collect funds directly, launching open calls to the wider public through the internet. A web-based intermediary, a crowd-funding platform, usually helps with publishing campaigns and collecting funds. The practice has become increasingly widespread since the financial crisis, as bank lending reduced and access to finance became more difficult. Industry estimates show that almost half a million projects were financed through crowd-funding across Europe during 2012, raising EUR 735 million, 65 % more than in 2011, and the forecast for 2013 is EUR 1 billion (EC, 2014). Crowd-funding has the potential to finance different types of projects, including green ones that have difficulties in accessing other forms of funding.

An example is the German start-up, E-volo, which raised EUR 1.2 million in a reward-based crowd-funding campaign for the development of an environment-friendly and emission-free helicopter.

Green bonds are aimed at financing investments with an environmental benefit or a focus on reducing vulnerability to environmental change. The timing of cash flows for green projects is generally compatible with payments from bonds, in that green projects usually require substantial upfront investment and subsequently produce regular returns, which is why bonds are particularly suitable for financing renewable energy or energy-efficiency initiatives.

Overall, including both corporate and international organisations, green bond issues are estimated to have increased more than fivefold in 2013 compared to 2012.

At the end of 2013, Toyota, the carmaker, issued a USD 1.75 billion green bond for supporting green projects within the company. Also in 2013, Unilever, the world's second largest food producer by sales, issued a GBP 250 million green bond for financing initiatives aimed at reducing the environmental footprint of the company, opening a new chapter for this kind of instrument (Scheherazade and Bolger, 2014).

Tax-shifting programmes

Environmental fiscal reform (EFR) is 'a reform of the national tax system where there is a shift of the burden of taxes from conventional taxes such as labour to environmentally damaging activities, such as resource use or pollution' (EEA, 2005). During the last two decades several EU Member States — Denmark, Finland, Germany, the Netherlands, Sweden, and the United Kingdom — implemented EFRs and the overall performance of these were evaluated in the EC-funded research project Competitiveness Effects of Environmental Tax Reforms (COMETR) — the findings of which are published in Andersen and Ekins (2009).

The results of the assessment exercise show that the environmental objectives of EFRs are being met, measured by a reduction in greenhouse gas emissions and in total fuel consumption, and that the effects of EFRs on GDP are small and, if anything, positive.

The OECD report - Why New Business Models Matter for Green Growth indicates that *“the availability of financial resources is arguably the most important enabling condition for the long-term transition to a resource-efficient green economy”*. In this respect it is important to look at newly emerging trends in the world of green finance, and consider the different types of public and private vehicles that can direct resources to green economy investment, and to look at financial innovations which may provide new solutions and the right incentives to mobilise private capital.

One of the challenges facing the move towards a greener economy relates to making the link between the higher short-term costs of investment in new technologies and the medium-to-long-term cost savings resulting from an increase in efficiency. In order to

make this link, policy integration is essential so that industrial policy concerns can be dealt with when designing environmental and climate policy. Even if the role of the public sector is set to decrease and leave room to private actors, public funds remain crucial providers of the right incentives and economic rationales for private companies to be successful, particularly in the light of the reluctance of private investors to provide long-term capital to fund the riskiest projects.

Achieving the benefits expected from economic instruments and environmental fiscal reforms depends crucially on the design of the tax structure; a challenging task to design a tax structure that achieves economic growth, helps to reduce national debt levels, creates jobs, and promotes the environmental and social aspects of a green economy.

10.1 From Commitment to Action

Strategies to achieve greener growth are needed. In order to make sure that the progress in living standards we have seen these past fifty years does not grind to a halt, we have to find new ways of producing and consuming things. Furthermore, people need to be educated and trained to acquire the necessary skills to reap the employment benefits from the structural change.

Policies that promote green growth need to be founded on a good understanding of the determinants of green growth, and need to be supported with appropriate information to monitor progress and gauge results.

Monitoring progress towards green growth requires indicators based on internationally comparable data. These need to be embedded in a conceptual framework and selected according to well specified criteria. Ultimately, they need to be capable of sending clear messages which speak to policy makers and the public at large.

ANNEX 1 – CIRCULAR ECONOMY

The following is an abstract taken from <http://www.circle-economy.com/circular-economy/>

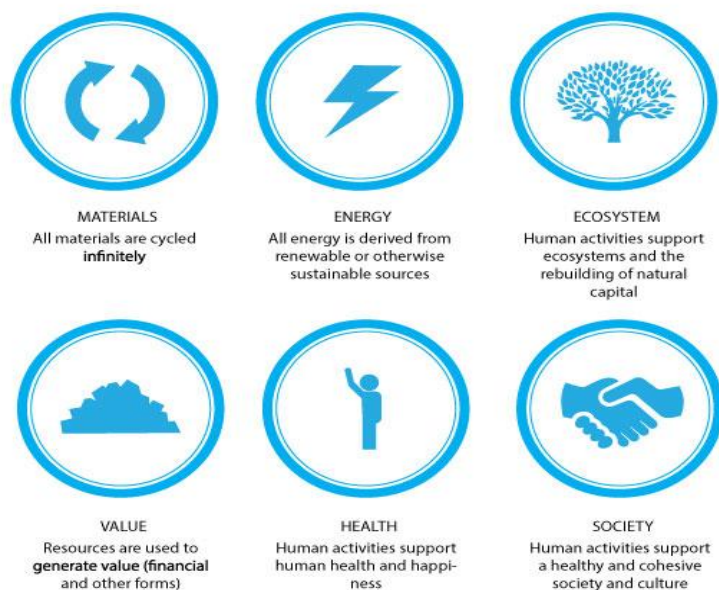
WHAT IS A CIRCULAR ECONOMY?

The best way to explain what a circular economy is, is to compare it to our current linear economy. In our current economic system, we extract resources from our planet at an ever-increasing pace, and turn them into a product that we mostly dispose after use. From the perspective of an individual or organization, that seems efficient. However, zooming out to a global level shows how unsustainable this approach is.

In order for those same individuals and organizations to thrive, we need an economic system that operates within our planetary boundaries. The circular economy concept decouples growth and prosperity from the use of natural resources and ecosystems. By feeding products, components, untapped resources and materials are back into the appropriate value chains, we can create a healthy economy that is inspired by and in balance with nature.

SIX PRINCIPLES TO CHANGE THE SYSTEM

Circular economy is all about closing resource loops, mimicking natural ecosystems in the way we organize our society and businesses. But we shouldn't be closing loops just for the sake of it. We also have to take into account the social and ecological impact of our actions, and use renewable energy to make the transition towards a circular economy happen. Therefore, we defined six principles for a successful circular economy that are depicted below.



ANNEX 2 –NSO CLASSIFICATION OF GREEN JOBS BY N.A.C.E. CLASSIFICATION

Green Jobs – NSO N.A.C.E Rev. 2 classification

N.A.C.E Category	Description
25	Manufacture of fabricated metal products, except machinery and equipment
26	Manufacture of computer, electronic and optical products
28	Manufacture of machinery and equipment n.e.c
32	Other manufacturing
36	Water collection, treatment and supply
37	Sewerage
38	Waste collection, treatment and disposal activities; materials recovery
39	Remediation activities and other waste management services
42	Civil engineering
43	Specialised construction activities
46	Wholesale trade, except of motor vehicles and motorcycles
47	Retail trade, except of motor vehicles and motorcycles
49	Land transport and transport via pipelines
70	Activities of head offices; management consultancy activities
71	Architectural and engineering activities; technical testing and analysis

72	Scientific research and development
81	Services to buildings and landscape activities
82	Office administrative, office support and other business support activities
84	Public administration and defence; compulsory social security

