



Draft *'Biofuels in Transport'*
Public Consultation
2010

Malta Resources Authority

Malta

June 2010

CONTENTS

1.	INTRODUCTION – THE DOCUMENT	5
	1.1 Background	5
	1.2 Scope and Structure of the Policy Document	5
	1.3 Coherence with other published documents	6
2.	TECHNICAL REVIEW OF BioFUELS	7
	2.1 Definition and History	7
	2.2 Types of Biofuel	7
	2.2.1 Solid and Gaseous Biofuels	7
	2.3 Liquid Biofuels	7
	2.4 Why biofuels?	9
	2.4.1 Environmental Benefits	9
	2.4.2 Security of Supply	10
	2.4.3 Green Jobs	11
3.	RENEWABLE ENERGY AND TRANSPORT SECTOR	12
	3.1 Malta’s Renewable Energy Target Commitments	12
	3.2 Malta’s Energy and Emissions from Transport Scenario	12
4.	THE EU DIRECTIVES AND MALTESE LEGISLATION RELATED TO BIOFUELS	13
	4.1 Directive 2003/30/EC	13
	4.2 Directive 2009/28/EC	13
	4.3 Local Legislation related to Biofuels	13
5.	BIOFUEL UTILISATION IN THE MALTESE ISLANDS	15
	5.1 Historical consumption 2003-2008	15
	5.2 The projected (target) demand of biofuels	16
6.	THE STRUCTURE OF THE MALTESE BIOFUELS MARKET	18
	6.1 Manufacture of Biofuels	18
	6.1.1 Scale of Manufacture	18
	6.1.2 Raw Material	18
	6.2 IPPC Permitting	20
	6.3 Disposal of Glycerine	20
	6.4 Research and Development	20
	6.5 Other Sources of Renewable Fuels for Transport	21
7.	CONSUMER SERVICES/RESPONSIBILITIES	22

7.1 Availability of Biodiesel	22
7.2 Promotion of Biofuels	22
7.3 Labelling of Biofuels	23
7.4 Biofuel Standards and Fuel Quality	24
7.5 Precautions when opting for biodiesel and the modifications required	24
8. PROPOSED WAY FORWARD	25
8.1 Legal Framework	25
8.2 Mandatory Substitution Obligation	25
8.3 Regulation Charge	26
8.4 Incentives to biofuels	27
8.5 Promoting Local Production	28
Annex I - POLICYMAKERS AND IMPLEMENTERS	29
Annex II - SELECTED EU LEGISLATION RELATED TO THIS PUBLIC CONSULTATION DOCUMENT	31

1. INTRODUCTION – THE DOCUMENT

1.1 Background

The energy landscape in Europe is passing through a period of profound transition as it tries to wean itself out of fossil fuel dependence and embrace renewable energy (RE) and other alternatives. Current thinking is that, given the urgency of this transition in the interest of fighting climate change (CC), all promising RE and other alternative technologies are to be pursued while new ones are researched and demonstrated. A mix of available technologies is to be adopted in the energy portfolio of the member states.

Malta's policies to address the country's RE and CC challenges are generally similar to and coordinated with the European Union's (EU) energy and environment policies. A driver and co-ordinator of these efforts in favour of renewable energy is Directive 2009/28/EC, which sets out targets to be achieved by member states of the EU.

Transport is indicated as a sector, which needs specific attention given the magnitude of the energy it consumes and the technical difficulties associated with applying RE technology with mobile vehicles. A specific target for this sector is therefore defined so as to ensure that sufficient effort and resources are directed to it and it does not lag behind in adopting RES.

Biofuel is one possible source of energy that is technically possible to adopt immediately for transport purposes. Biofuel is produced from biomass. Some waste, which otherwise would have to be disposed of, makes suitable biomass for biofuel production. Use of this source is therefore to be encouraged and rewarded.

However, given the incentives being offered to encourage the use of biofuel, statutory obligations, the magnitude of the demand expected to be generated and hence the amount of raw material required to produce it, it is likely that large areas of land and natural resources would be devoted to production of energy crops. This raises questions of environmental management, food availability, social impact and other sustainability issues, which must all be appropriately addressed and governed.

Malta must play its part in this scheme of things, through moral conviction that it needs to do its share to combat climate change, and because of its international obligations. This consultation process is part of the process of promoting the use of biofuels in Malta.

1.2 Scope and structure of the policy document

The objectives of this public consultation process and documentation is to increase the knowledge of the general public not only on the obligations set out in front of Malta by the European Directives but also on the manner by which these obligations would be met for the benefit of the nation. The public consultation also promotes the use of biofuel in transport by providing stakeholders with information, thereby enabling them to make informed decisions and educated choices. This information includes information on issues related to biofuels in general, with a special focus on transport, and also the Malta Resources Authority's (MRA) proposals of how the biofuels market is to develop holistically, leading to increased and

appropriate consumption of biofuels. This consultation process is also intended to invite stakeholders, including the public to contribute their views and opinions on any matter related to this development. The MRA is keen to understand public perceptions and expectations in this regard so that the best way forward to provide a realistic, cleaner and sustainable alternative to fossil fuels is determined.

This document is structured as follows:-

- Background information on RES obligations including biofuels, and on biofuel technology in general;
- The magnitude of demand for biofuels – historical demand, how MRA projects future demand in the light of Malta’s international obligations and how this can be met by a ‘substitution obligation’ imposed on operators placing petroleum products on the market;
- The structure of the market;
- Issues relating to manufacturing, covering indigenous and imported ‘waste’ or other imported feedstock, imported biofuels for blending and ready blended in petroleum products and IPPC;
- Provision of consumer-friendly services – precautions for use of biofuels, labelling and products at the point of sale, standards and fuel quality, cost considerations; and
- Proposed way forward.

Where appropriate through the text, under the various headings/subheadings, MRA’s proposals on the way forward are inserted. These are intended to prompt opinions and feedback from stakeholders. Feedback on issues others than those brought up by the MRA are also welcome.

1.3 Coherence with other published documents

The Biofuels Policy intends to be coherent with other national policies/strategies and obligations in terms of objectives and timeframes. These include the Waste Management Strategy, the Climate Change Strategy, the draft Energy Policy, the National Energy Efficiency Action Plan, the Integrated Pollution Prevention and Control (IPPC) Directive, the National Emissions Ceilings (NEC) Directive and the EU’s Decision on Effort Sharing¹.

¹ **Decision No. 406/2009/EC** on effort sharing aims to reduce greenhouse gas emissions from sectors not included in the EU Emission Trading System (EU ETS) – such as transport, buildings, agriculture and waste.

2. TECHNICAL REVIEW OF BIOFUELS

2.1 *Definition and history*

Biofuel is a generic description given to all type of fuel produced from biomass, that is, the biodegradable fraction of products, waste and residues from agriculture (including vegetal and animal substances), forestry and related industries, and the biodegradable fraction of industrial and municipal waste

The development and use of fuels derived from biomass goes back to hundreds of years and their use was mainly for heating and cooking purposes. In the early days of the automobile industry, designers and engineers had considered using liquid biofuels. Indeed, the inventors of the spark-ignition (petrol) engine and of the Diesel engine had both developed their machines to work on biofuels. Later on however, given the abundant supplies of crude oil the automobile industry started relying on petroleum-derived fuels, such as petrol and diesel to drive its machines, cars and trucks. Interest in biofuels eventually started fading away. The "energy crisis" of 1973 prompted a renewed interest in energy issues, an increased awareness in the importance of energy security, the need to diversify the energy mix and in renewable energy in general. Current concerns over greenhouse gas emissions resulting in climate change, rural development interests, and instability in the Middle East, reinforce interest in biofuels.

2.2 *Types of biofuel*

Biofuels can be found in solid, liquid or gaseous form and include such products as biodiesel, biodimethylether, bioethanol, biogas, biohydrogen, biomethanol, bio-ETBE, bio-MTBE, pure vegetable oils and synthetic biofuels. Biofuels can be used in almost all applications where petroleum products are used. Their use in the aviation industry is still very limited, almost inexistent, however recent studies and experimental flights might in the future lead to a breakthrough and a wider use similar to that experienced in the road transport sector. The following is a list of the main biofuels available and a brief description of their use.

2.2.1 *Solid and gaseous biofuels*

Examples of solid biofuels are wood and charcoal which are in everyday use for heating and cooking. Biogas is a renewable fuel, which is produced by the breaking down of organic matter by a process of microbiological activity. Practically, this means that rotting organic waste, food waste or sewage (both human and animal) is turned into gas by means of an 'anaerobic conversion' in a digester or collected from engineered landfills. This is happening in Malta today but is outside the scope of this consultation.

2.3 *Liquid biofuels*

Liquid biofuels are the most convenient to use in transport.

Currently, the most important biofuel in Europe is **biodiesel (Fatty Acid Methyl Ester - FAME)**. It is

produced from Vegetable Oil that can be converted to biodiesel by a chemical process known as transesterification. Biodiesel can replace diesel entirely or it can be mixed in different proportions. The volumetric energy content of biodiesel is about 10% lower than that of diesel. (*Biodiesel: 33 MJ/ltrs*)². An important by-product of biodiesel production is glycerine, which is primarily utilised by cosmetic and pharmaceutical industries. The most commonly used biodiesel in Europe is Rapeseed-Methyl-Ester (RME). Other vegetable oils can also be used as feedstock, as well as used fats, such as waste cooking oils from restaurants. Biodiesel is mainly used in low-biofuel blends (typically 5% or 7%, in line with the European diesel standard) with fossil diesel, for example in France, Italy, Sweden and Germany. Higher proportion blends³ and pure biodiesel⁴ also exist in different countries, but these are used in modified vehicles.

Biodiesel can be blended with petroleum diesel at different concentrations. Car engine manufacturers usually recommend the concentration which best suits a particular type of engine. Currently, all diesel engines can operate with mixtures of up to 5% biodiesel (B5), however certain engine manufacturers do not discourage and actually suggest higher blends of biodiesel to be used, always provided that this complies with the relevant standard for biodiesel.

Bioethanol is the most used biofuel worldwide. It is produced from sugar (or starch)-containing agricultural products such as sugar cane (Brazil), corn (United States), wheat, sugar beet or waste from sugar refineries. Bioethanol is best used in blends with petrol in spark ignition engines, as its octane rating is high, implying very good anti-knock characteristics. However, the volumetric energy content is lower compared to petrol (*circa* two-thirds of that of petrol). Bioethanol has a lower vapour pressure than petrol, but the vapour pressure of a bioethanol-petrol is higher than that of pure petrol, especially when the blend's ethanol concentration is low.

At present, bioethanol is used in several EU Member States, mostly in the form of **ETBE (Ethyl Tertiary Butyl Ether)** to avoid corrosiveness problems because of the presence of oxygen in ethanol/petrol blends. ETBE is perfectly mixable with petrol (it is allowed in blends up to 15% in European petrol) and improves the combustion properties of petrol. ETBE replaces the expensive additive MTBE (anti-knock medium). Currently only blends up to 5% of bioethanol are allowed in European petrol.

Another possibility to bring bioethanol into the market is the so-called **E85** (85% ethanol and 15% petrol). It is being used in Flexible Fuel Vehicles (FFVs) with modified engines that are able to run on

² Annex III – Energy content of transport fuels - Proposal for a Directive of the European Parliament and of the Council on the promotion of the use of energy from renewable sources (COM (2008) 19).

³ In France and the Czech Republic, blends of 30% and 31% biodiesel are used respectively.

⁴ In Germany and Austria, B100 is available in the retail market.

either E85 or petrol, or any mixture of the two. The main market for this fuel is Brazil whilst in Europe it is mostly used in Sweden.

The so-called **Second Generation Biofuels** are not marketable currently. The most important second-generation biofuel currently under research is **BtL (Biomass to Liquid)**. It is produced using the Fischer-Tropsch process (or Fischer-Tropsch Synthesis). It consists of a catalyzed chemical reaction in which synthesis gas (syngas), a mixture of carbon monoxide and hydrogen is converted into liquid hydrocarbons of various forms. The principal purpose of this process is to produce a synthetic petroleum substitute. It should be largely carbon dioxide (CO₂) neutral and therefore play a major role in protecting our environment and climate in the future. BtL should be marketable by the end of 2010. It can be used in diesel or petrol engines without the need of modification.

2.4 Why biofuels?

Biofuels are usually attributed with two main benefits, namely environmental and security of supply.

2.4.1 Environmental benefits

2.4.1.1 General environmental benefits

The main environmental benefit of biofuels arises because during their production, there is an important CO₂ sink element, that is, they absorb carbon dioxide. Over one complete cycle, that is, from vegetable plant cultivation (when they absorb CO₂) to combustion (when they emit CO₂) the net production of CO₂ is lower for biofuels compared to petroleum fuels, which just release CO₂ during their life cycle. Even though fossil fuels originated from vegetable matter and are biofuels in a sense, they absorbed their share of CO₂ too long ago to be of benefit in the current fight against climate change. Hence, replacing petroleum fuels with biofuels helps in reducing the release of CO₂ into the atmosphere and therefore reduces the contribution to anthropogenic (human-induced) climate change.

Currently, a vigorous debate is ongoing on the actual savings in CO₂ from biofuels and the sustainability of biofuels, given that uncontrolled cultivation of crops used to produce biofuels may lead to deforestation of natural habitats, especially in territories such as South-East Asia and Brazil. In this regard the EU is proposing that a certification system is put in place to ensure the sustainability of the raw materials used to produce biofuels and that a minimum threshold of greenhouse gas savings is attached to biofuels produced from different raw materials.

2.4.1.2 Greenhouse Gas Emissions benefits with specific reference to Malta

A special mention is needed, when discussing the environmental benefits of biofuel use in Malta. While the general environmental benefits are true for large countries where biofuels crops are grown, from a local perspective the contribution of use of biofuels towards the reduction of national Greenhouse Gas

Emissions (GHG) is limited, if any. The “sink” element of a biofuel’s life-cycle does not take place locally and in terms of national GHG emissions inventories, the net CO₂ emissions are equivalent to the total CO₂ emissions from the biofuel’s combustion in the local market – unless specific rules different from current emission estimation practices are provided for.

2.4.1.3 Exhaust emissions from the use of biodiesel

A study by the U.S. Environmental Protection Agency (EPA) has shown that several pollutants which also affect human health are reduced by the use of biodiesel instead of fossil diesel. For example the ozone forming potential of biodiesel hydrocarbons is less than diesel fuel. Sulphur emissions are essentially eliminated with pure biodiesel. Further the use of biodiesel in diesel engines results in substantial reductions of unburned hydrocarbons (HC), carbon monoxide (CO) and particulate matter (PM). Emissions of nitrogen oxides (NO_x) slightly increase.

2.4.1.4 Exhaust emissions from the use of bio-ethanol.

The major part of engine exhaust streams during ethanol combustion consists of the components nitrogen, carbon dioxide and water. All three components are non-toxic to human health. However, about 1.4% of petrol engine exhaust emissions are composed of more or less harmful substances to human health. Apart from the above mentioned emissions, fuel combustion emits particulate matter (PM), volatile organic compounds (VOCs), nitrogen oxides (NO_x), carbon monoxide (CO) and a variety of other toxic air pollutants.

Harmful engine exhaust emissions from combustion of ethanol are generally lower when compared to the tailpipe emissions of fossil petrol. Thus ethanol can reduce certain vehicle pollutant emissions which exacerbate air quality problems, particularly in urban areas. Among the biggest benefits from using ethanol is the high reduction potential of CO emissions and the impact of ethanol on NO_x are minor. Most importantly when petrol is blended with ethanol, emission of most toxic pollutants, like benzene, butadiene, toluene and xylene decrease. On the other hand ethanol blended petrol emits higher HC and VOC than petrol.

2.4.2 Security of supply

Fossil petroleum fuels are mostly sourced from outside the EU. The Community has limited control on their availability and pricing. This dependence on outside sourcing creates political constraints in the Community’s relations with third countries, and the Community has recently suffered disruption in supply with serious repercussions on the economies of several Member States. Diversification of the fuel-mix of Member States, especially with indigenously produced fuels, would go a long way in enhancing security of supply and reducing the risks that are associated with the volatile energy market. Biofuels present such an opportunity.

2.4.3 *Green Jobs*

Being a commercial activity biofuels will help in the creation of new jobs, through possible local and foreign investment.

3. RENEWABLE ENERGY AND TRANSPORT SECTOR

3.1 Malta's Renewable Energy Target Commitments

Malta's policies to address the country's renewable energy and climate change challenges are generally similar to and coordinated with the EU energy and environmental policies. Our international commitments are leading us not only towards ambitious targets to increase energy efficiency, use of renewable energy and greenhouse-gas emission reduction, but are also offering the country new opportunities for growth. The European Union's overall targets for the reduction of GHG by at least 20% of 1990 levels, increased use of renewable energy sources to 20% of the final energy consumption and reducing energy consumption by 20% have led Malta to actively seek to promote and increase the use of renewable energy sources. In this regard, a target of 10% energy from renewable sources in final energy consumption by 2020 has been set. Government is actively implementing and proposing various measures to tap renewable energy and diversify the energy mix. The measures implemented in this policy will therefore have to respect any other obligations that Malta has such as those stemming from the EU and any Multilateral Agreements to which Malta is a party so as not to be in conflict with them.

3.2 Malta's Energy and Emissions from Transport Scenario

Transport is one particular sector, which is strongly interrelated to energy and emissions. On an international scene in 2009 the Commission published Directive 443/2009/EC that requires that all new light passenger cars registered in the EU should have a specific emission factor of 130 grams of CO₂ per kilometre (g CO₂/km). In addition to this, the EU is also addressing issues related to car components, such as air conditioning and tyres, to improve the overall energy and environmental performance. Stricter rules on vehicle labelling and awareness-raising campaigns will help promote the most energy-efficient vehicles.

In Malta, the transport sector is a significant contributor of CO₂ emissions (second highest contributor to national GHG emissions, after the energy generation sector) and other pollutants. Improving efficiency in transport in general could lead to a reduction of fuel consumption in the sector. If the reform in mass transportation leads to an increase in the use of public transport then there is likely to be considerable room for improving the country's transportation fuel bill. This can potentially generate other improvements, including reduction in air and noise pollution and other direct and indirect benefits associated with reduced pressure on the transport infrastructure.

In recent years, the average age of the national vehicle stock has gone down, even though 33% of vehicles are over 10 years old, and another 41% are between 6 and 10 years old. The road transport sector accounts for almost 20% of total primary fuel consumption and has the fastest growth in consumption⁵. It is heavily dependent on fossil fuels and increases the environmental risk through GHG emissions and air pollution.

⁵ Draft Energy Policy for Malta, April 2009

4. THE EU DIRECTIVES AND MALTESE LEGISLATION RELATED TO BIOFUELS

4.1 Directive 2003/30/EC

Fairly recently, the main tool in the EU to promote the use of biofuels or other renewable fuels to replace diesel or petrol for transport purposes was the European *Directive 2003/30/EC on the promotion of the use of biofuels or other renewable fuel for transport*. Directive 2003/30/EC was transposed into Maltese Legislation through Legal Notice 528 of 2004.

This Directive set an **indicative** reference target of 5.75% of biofuel and other renewable fuels replacing petrol and diesel for transport purposes to be placed on the national market of each Member State by the 31st December 2010. Being an indicative target, each Member State could adopt its own target within this guideline. Given the scarcity of arable land and water resources for the production of energy crops used in biofuels production, Malta set its national indicative target to 1.25% for 2010. An intermediate target for 2005 was set at 0.3%. Malta exceeded that target by 0.22%, with the actual figure reaching 0.52%.

The directive also set definitions for the different biofuels and basic market rules, such as the obligatory labelling of percentage of biofuels in fossil fuels higher than 5%.

4.2 Directive 2009/28/EC

Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, which is a follow-up to the above-mentioned directive, requires that Member States should achieve a share of energy of the gross final consumption from renewable resources. As per Annex I of this directive, Malta has the obligation of achieving a 10% target of the share of energy from renewable sources in the gross final consumption of energy by 2020. This includes energy consumed in transport, electricity, heating and cooling.

Malta's final target is 10% of renewable energy in the final consumption of 2020, including the use of 10% of renewable fuel in transport. Currently, the National Renewable Energy Action Plan is being prepared with the aim of achieving the set targets.

This Directive sets very stringent 'Sustainability Criteria' for raw feed stock used in the production of biofuel to qualify towards reaching the targets and to benefit from subsidy schemes that government may set up to promote the uptake of Biofuel.

4.3 Local Legislation related to Biofuels

Currently, biofuels in Malta are regulated by:

- *Legal Notice 528 of 2004 - Use of Biofuels or Other Renewable Fuels for Transport Regulations*, which establishes regulations and reporting requirements to promote and report the utilisation of biofuels and other renewable fuels in the transport sector; and

- *The Excise Duty Act (Chapter 382 of the Laws of Malta)*, which grants the exemption of the payment of the excise duty on the biomass content in biodiesel while obliging producers of biofuels to register their operations with the Customs Department and report the production and source of biofuels produced.

Additionally, other Legal Notices, which are related to the biofuels sector are the:

- *Legal Notice 44 of 2004 - Quality of Fuel Regulations*, which set the basic minimum requirement of the quality of fuels which are to be placed on the inland market for both transport and the industrial sector; and
- *Legal Notice 278 of 2007 – Petroleum for Inland Fuel (Wholesale) Regulations*, which relates to the regulation of operators in the inland fuel market such as importers and wholesalers of petroleum.

5. BIOFUEL UTILISATION IN THE MALTESE ISLANDS

5.1 Historical consumption 2003-2008

Given the scarce arable land available in Malta and the limited amount of fresh water resources, cultivation of crops for biofuel production is not a feasible or sustainable option. Currently, biodiesel produced from either locally sourced recycled waste cooking oil or imported vegetable oil is the only source of indigenously produced biofuel, and in this regard privately owned companies in Malta have been very active in producing and promoting biodiesel for domestic consumption.

Although still marginal compared to the overall consumption of transport fossil fuels, the production and consumption level of biodiesel in Malta has seen a steady increase ever since its introduction in 2003, at least till 2007. The following charts show the consumption by sector of biodiesel in Malta between 2003 and 2008 (Chart No. 1) and the annual transport fuels volumes sold (Chart No. 2).

Chart No.1 – Consumption of Biodiesel in Malta between 2003 and 2008⁶

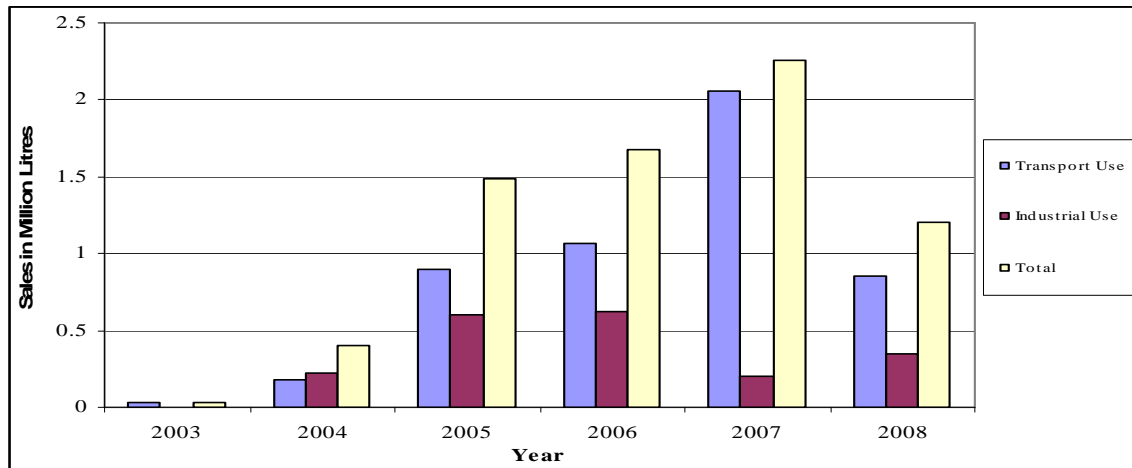
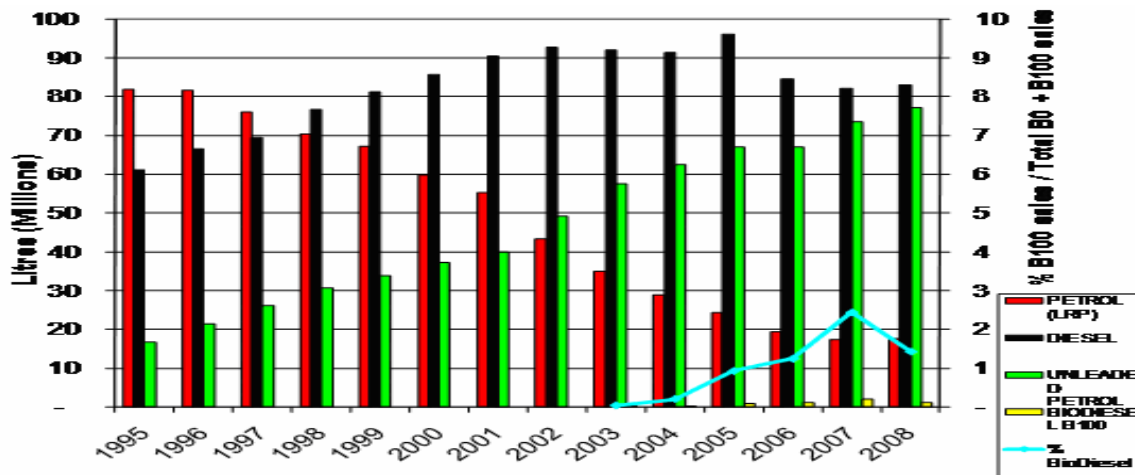


Chart No. 2 – Historical Trend in Annual Transport Fuels volume sold in Malta



⁶ Malta's Annual Reports 2003 - 2008 submitted to fulfill requirements of Article 4 of Directive 2003/30/EC on the promotion of biofuels and other renewable fuels for transport.

Particularly in the transport sector biodiesel, has experienced a marked increase over the period 2003-2007. The total sales of biofuel increased from 0.03 million litres in 2003 to 2.26 million litres in 2007. This increase was mainly attributable to a higher availability of biodiesel from stations. However a decline was observed in the use of biofuels in 2008.

Amongst the factors, which are attributable for such a reduction, are:

- No easy access to pre-blended biofuels;
- Public concern on the quality of biofuel being retailed;
- No significant financial benefit to balance real or perceived risk; and
- Lack of public information and uncertainty on the product.

The aim of the policy paper is also partly to present how the MRA intends tackling these shortcomings.⁷

5.2 The projected (target) demand of biofuels

Estimating future demands depends on many factors, including several issues which can affect public behaviour and fuel consumption. An indicative scenario that has been drafted by the ADT concludes that the amount of petrol and diesel consumption for transport in 2020 is expected to increase to around 117 Million litres and to 90 Million litres respectively.

If Malta had to opt for bio-ETBE⁸ and biodiesel as a substitute for petrol and diesel respectively and it had to stick to industrial standards set by the current revisions to the European fuel quality standards, that set the maximum limit of biofuels in petroleum diesel and petrol, Malta would still not meet the 10% RES energy target. The reason is that, given the different calorific values, in terms of energy content a litre of biodiesel (33 MJ/ltr.) does not substitute exactly a litre of diesel (36 MJ/ltr.). In practice, this means that on a volumetric basis one requires a larger volume of biodiesel for every litre of diesel substituted. Similarly, for petrol and bio-ETBE the energy content of the latter (27 MJ/ltr.) is lower than the former (32 MJ/ltr.). Moreover, in the case of bio-ETBE only 37% of this value is considered as a renewable fraction.

Based on the data listed above the projected energy requirement for petrol and diesel in 2020 is of 0.158 *Mtoe* (Million tonnes of oil equivalent). Therefore the RE energy target of 10% would be of 0.0158 *Mtoe*.

- Biodiesel possible maximum substitution
limit as per future CEN standard **7% v/v**

⁷ These factors are treated in more detail in Sections 7.1, 7.4 and 8.4.

⁸ Currently the use of bioethanol is still not being considered as an option for the Authority due to vapour related issues.

• Biodiesel needed in 2020 as a substitute for diesel based on ADT estimate and maximum allowable substitution based on EU standards, (<i>approx.</i> Million Litres)	6.3
• Resulting Equivalent Energy Substitution, <i>Mtoe</i>	0.00496
• Net RE Substitution due to biodiesel, <i>Mtoe</i>	0.00496
• Bio-ETBE possible maximum substitution limit as per future CEN standard	22% v/v
• Bio-ETBE needed in 2020 as a substitute for petrol based on ADT estimate and maximum allowable substitution based on EU standards, (<i>approx.</i> Million Litres)	25.8
• Resulting Equivalent Energy Substitution, <i>MToe</i>	0.0166
• Net RE Substitution due to bio-ETBE, <i>Mtoe</i>	0.006142
• Total Net substitution	0.0111
• Actual Percentage of energy substituted	7%

Based on the above figures MRA is proposing that in order to reach the 10% RES target, besides having an obligatory substitution of biofuel in the petroleum fuel, which will be discussed later on in this consultation document, other schemes in the transport sector would have to be put in place.

MRA is proposing that the country should aim to have a gradual biofuel increase over the period 2011-2020 leading to the final target of 10% by energy contents of the fuels imported in 2020.

6. THE STRUCTURE OF THE MALTESE BIOFUELS MARKET

6.1 Manufacture of Biofuels

6.1.1 Scale of Manufacture

Manufacturers can be classified into three categories Small, Medium and Large based on the scale of manufacture. The exact demarcation of these categories would be finalised after consideration of the views expressed by the interested parties during the public consultation period.

The rights and obligations of these producers towards consumers need to be regulated, also in terms of the market they supply. The degree of regulation needs to be proportionate and transparent, minimizing the bureaucratic and regulatory burden to the lowest possible level.

MRA proposes that all these operators are encouraged in the national interest. However, MRA also appreciates that different categories require different regulatory requirements.

6.1.2 Raw Material

Biofuel manufacture from indigenous feedstock - used cooking oil and animal fats - is already taking place in Malta. This activity:

- employs raw materials that are not only sustainable but also counts as twice for the purpose of meeting EU renewable energy targets⁹;
- is fully indigenous and so the security of supply element is maximised; and
- also assists in the national waste management.

MRA will encourage and support this activity. Wasteserv Malta Ltd. will also consider cooperation with any private operator with proposals of how waste collection can be maximised.

It is not excluded that other local feedstock sources, apart from waste cooking oil, are tapped as feedstock. Although likely to be difficult due to economies of scale, processing of animal fats into biofuels has aroused interest. Currently, animal fats are being incinerated. Processing of this waste into biofuels will have the added advantage of relieving the incinerator of this load, which is energy intensive.

MRA will evaluate new proposals in the light of EU legislation and local circumstances, and license accordingly.

⁹ Article 21 of Directive 2009/28/EC on the promotion of the use of energy from renewable sources – “For the purposes of demonstrating compliance with national renewable energy obligations placed on operators and the target for the use of energy from renewable sources in all forms of transport referred to in Article 3(4), the contribution made by biofuels produced from wastes, residues, non-food cellulosic material, and ligno-cellulosic material shall be considered to be twice that made by other biofuels.”

6.1.2.1 Importation of Waste

Importation of waste for processing into biofuels may take place. This is encouraged in principle because of its impact on the national biofuels target. In terms of trans-frontier waste shipment regulations, any foreign waste imported in Malta needs to be certified as going to a specific facility that is licensed to accept such waste. MEPA, the competent authority to license such importation is drafting a legal notice to regulate the shipment of waste. One major item of this new regulation shall be the prohibition of importation of waste for disposal. Therefore, importation of waste for processing into biofuels may take place as long as the provisions of the waste shipment regulations are abided to and if a facility in Malta is licensed to accept such waste, MEPA could also impose other conditions on permits for importation of waste for recovery.

MEPA will monitor and continue to regulate the composition and source of imported waste to ensure that good practice and avoidance of hazards is observed. MEPA could also impose other conditions on permits for importation of wastes for recovery

6.1.2.2 Sustainability Criteria of Biofuels

Directive 2009/28/EC, soon to be transposed into Maltese legislation, sets out a detailed set of sustainability criteria that bio-liquids should meet in order to qualify for national subsidy/incentive schemes and to count towards the country's RES (and transport share in RES) targets. The summary of these criteria below is given for information purposes only, has no legal value, and is not meant to convey all the detail found in the Directive.

The criteria are as follows:-

- That the GHG emission savings from the use of these biofuels/bio-liquids shall be at least 35%, rising to 50% after 1st January 2017. After the 1st of January 2018, this shall rise to 60% for new installations. This applies to all biofuels, even those produced from waste.
- That the biofuels/bio-liquids are not made from raw material obtained from land with high biodiversity value (described in detail in the directive), from land with high carbon stock or from drained peatland, and that community environmental requirements, including those for agriculture, protection of groundwater and surface water quality have been complied with.

Accordingly, all biofuels used in Malta that are compliant are to be so certified. MRA will, in terms of the Directive, have to ensure that the information used in the certification is reliable, that the information is available and has been audited independently to the required standard. The auditing will verify that the systems used by the economic operators are accurate, reliable and protected against fraud.

It is appreciated that this certification should not cause an excessive administrative burden upon operators. Accordingly, the Commission is working on establishing a list of minimum information that

needs to be supplied, and to conclude agreements with third countries containing provisions on sustainability criteria that correspond with this directive. In such cases, the biofuel supplier/importer will not be required to provide further evidence of compliance with sustainability directives. It is not likely that specifically grown energy crops will be produced in Malta to be used as raw materials for biofuel production. The legal framework to regulate for such an eventuality basically already exists and it is currently being reviewed to ensure it caters for specific EU obligations.

Regulations regarding the sustainability criteria for biofuels, transposing the relevant articles of Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources are being drafted and will soon be issued.

6.2 IPPC permitting

IPPC permitting is regulated by Legal Notice 234 of 2002 and amending Regulations 188/2004, 230/2004 and 56 of 2008. MEPA is the competent authority.

In the past, concern was expressed by small to medium sized operators that the rigour of the system and the administration involved, in relation to the planned scale of operations are such as to discourage enterprise. MEPA is currently exploring the possibility of having ‘general binding rules’ under the I.P.P.C. Regulations for such cases, thereby simplifying matters through having a standard permit for this scale of activity. This is likely to materialize but only for operations carried out in specifically designated industrial areas.

MRA will support MEPA in the steps being taken to simplify its procedures.

6.3 Disposal of glycerine

This by-product of biofuel manufacture has proven to be difficult to dispose of. Today incineration seems to be the only option for Malta, given the current scale of operations. Incineration is admittedly expensive.

The method of disposal of Glycerine is dependant on whether it is classified as a ‘by-product’ or a ‘waste product’. In the future, given sufficient output, cooperation between manufacturers and hence economy of scale, consideration will most likely be given to utilise Glycerine profitably for other uses. Disposal of Glycerine classified as a waste product will be according to the standards of ‘end of waste’ criteria in accordance with the provisions laid down in the Waste Framework Directive.

MRA will support such endeavours.

6.4 Research and development

The government encourages research and development in biofuels, and operators are encouraged to make use of schemes that support such research and development. Type of research that could be investigated locally

is the production of second generation biofuels and Hydrogen Fuel Cells powered by RES electricity.

6.5 Other sources of renewable fuels for transport

It must be noted that no trains or tube/metro systems exist in Malta, thus limiting the use of electricity in transport to individual vehicle systems. It is projected that the uptake of electric vehicles by 2020 is set to increase sensibly in line with EU projections. Plans are currently being prepared by the relevant national Authority to provide the necessary physical infrastructure and the appropriate licensing mechanisms.

7. **CONSUMER SERVICES/RESPONSIBILITIES**

7.1 *Availability of biodiesel*

In Malta, biodiesel is retailed either directly from the manufacturers or from a number of petroleum filling stations. At present filling stations are not allowed to mix or blend biodiesel ready for sale in their tanks but are permitted to store and sell B100 biodiesel. However, the customer has the right to choose the blending ratio at the point of sale. In terms of availability around 30 petroleum filling stations, equivalent to about 40% of total petroleum filling stations, retail biodiesel. Table 1 shows the number of stations retailing biofuels. The sale of biofuels from petroleum filling stations only started in mid-2006 and until then biofuels were only retailed directly from the producers. The significant increase in sales over the discussed period is in part also due to this higher and easier availability.

Table 1 – Filling stations retailing biofuel

Year	2006	2007	2008
Actual Number of filling stations retailing biofuel	14	29	30
Percentage of number of petroleum filling stations retailing biofuel	15	32	33

In other EU countries, different blends are available at filling stations in pre-determined mixes such as 2, 5, 7, 10 and 20% biodiesel.

MRA will address this area so that the system is re-structured to reflect recent changes in technology and practices used in other countries. It is the intention of the MRA to permit only ready blended biofuel to be available directly at the pump such as to remove the need for the majority of consumers of having to blend the product themselves. Consumer specified higher blends would however still be available upon request through dedicated pumps. This is also in view of the fact that, as from the 1st of January 2011, LRP will no longer be retailed at petrol stations. This may induce many petrol station operators to convert their LRP pumps into other fuel types, possibly including various blends of biofuels.

7.2 *Promotion of biofuels*

Biofuels are currently more expensive than conventional fuels, and in order to reduce the discrepancy, countries within the EU can opt to choose different financing mechanisms. In general, however, the following are the favoured mechanisms:

- Fiscal Incentives, where a Country decides to exempt biofuels partially or fully from the payment of excise duty normally paid for transport fuels.
- National Grants, where a Country decides to give grants for the cultivation of energy crops.

- Substitution obligation, where a Country may decide that all petroleum market operators who place petrol and diesel on the market for the first time or import these fuels into the country are obliged to market a percentage of biofuels determined by legislation.

Malta has so far opted for the first mode of promotion and currently the biomass content (i.e. the percentage element) in biodiesel is exempted from the payment of excise duty. This makes biodiesel currently cheaper than petroleum diesel retailed in filling stations and therefore a fiscal incentive provides one of the driving forces for the biodiesel sales. Table 2 below gives a summary and compares the excise duty rates of the four main types of fuel used in the transport sector.

Table 2– Excise Duty on transport fuels retailed in Malta¹⁰

Fuel	LRP	Unleaded	Diesel	Biodiesel (Biomass Content)
Excise Duty (Euro/ltr)	0.5582	0.4394	0.3524	0

Unfortunately, notwithstanding this fiscal incentive, which in 2007 is estimated to have accounted to around €672,000 of foregone revenue from excise duty, there is currently little or no significant price difference for the end consumers between the retail price of diesel and that of biodiesel. This marginal difference in price is not enough of an incentive for consumers to blend biodiesel in their consumption.

MRA is proposing that such a system of tax exemption is replaced partly by a mandatory substitution obligation¹¹, with the tax exemption being limited only to biofuels used beyond the legal requirement of the mandatory substitution obligation.

7.3 Labelling of biofuels

Much of the world uses a system known as the “B” factor to state the amount of biodiesel in any fuel mix. Biodiesel can be mixed with petroleum diesel in any percentage, from 1 to 99, which is represented by a number following the letter B. For example, B5 is 5 percent biodiesel with 95 percent petroleum diesel, B20 is 20 percent biodiesel with 80 percent petroleum diesel, or B100 is 100 percent biodiesel, with no petroleum diesel added¹². Similarly, in terms of bioethanol the letter “E” is used to show the percentage of bioethanol in a fuel mix.

Maltese legislation requires that petroleum diesel and petrol products placed on the market, having a percentage of biodiesel or bioethanol exceeding 5% must be labelled at the point of sale. Petroleum diesel and petrol products not exceeding such a limit are not required to show any specific label.

¹⁰ Excise Duty Act: Chapter 382

¹¹ A mandatory substitution obligation refers to a market situation imposed by regulation where all oil operators/importers operating in a set market are obliged to blend a specific amount of biofuel into their product before placing it on the market.

7.4 Biofuel standards and fuel quality

European Standards EN 590, EN 228, EN 14214 and pr EN 15376 set the minimum quality parameters that petroleum diesel, petrol, biodiesel, and bioethanol respectively must possess in order to be placed on the market. Currently a revised EN 590 will limit the amount of biodiesel, which can be placed in petroleum diesel to 7% by volume, provided that the biodiesel satisfies the EN 14214 standard. Similarly, for petrol a revised EN 228 will limit the amount of bioethanol and bio-ETBE, which can be placed in petroleum petrol to 10% by volume and 22% by volume respectively. Provided again that the bioethanol satisfies the pr EN 15376 standard.

MRA is in the process of formulating a biofuel quality program that will include regular random checks on biofuel quality retailed from filling stations. Concurrently, through the new regulatory framework, which is being proposed, operators operating in the biofuels market will be obliged to conduct regular quality checks and to keep an up to date detailed audit trail of such quality checks.

7.5 Precautions when opting for biodiesel and the modifications required

Certain biofuels at certain amounts in fossil fuel require certain minor modifications in the engine of a car. In the specific case of biodiesel, biodiesel possesses certain features that may require specific modifications to the vehicle in which it is used. These modifications are normally relatively minor and inexpensive. The following are the main and most common modifications:

- Certain engine components coming into contact with biodiesel, for example hoses and seals, must be resistant to biodiesel. In particular biodiesel will degrade natural rubber gaskets and hoses in vehicles, mostly those manufactured before 1992, although these also tend to wear out naturally. Rubber components will most likely have to be replaced with fluorinated elastomer, which is inert to biodiesel.
- Biodiesel is very hard to evaporate; therefore, it can accumulate in engine oil especially during idling operation by commercial vehicles. Consequently, all manufacturers of commercial vehicles prescribe shorter oil-change intervals in order to avoid damage by diluted engine oil.
- After extended periods of running on pure petroleum diesel, vehicles converted to biodiesel should undergo a one-time fuel filter replacement after 2-3 tankfuls of biodiesel outside the regular service intervals. This prevents old depositions of petroleum diesel removed by the flow of bio-diesel through the fuel system from blocking the new fuel filter.

MRA will always be available to guide and provide information to the public on the required changes to be carried out.

¹² Biofuels Informative Brochure, Malta Resources Authority, June 2008

8. **PROPOSED WAY FORWARD**

8.1 *Legal framework*

The MRA is of the opinion that the biofuels market has evolved to such an extent, that it now needs a regulatory framework in order to ensure fair competition and consumer confidence in the product placed on the market. For this reason, the MRA is proposing that a legal framework be put into place with the aim of laying down not only the obligations of all players in the biofuel market but also their rights and *modus operandi*. Such a framework, which will consist of a licensing regime, will differentiate between the different scale of manufacturers based on the rights and obligations of such operators.

The frameworks' primary aims will therefore be:

- to guarantee that the biofuel is sourced from sustainable sources;
- to guarantee a fair playing field amongst all operators;
- to ensure that only good quality biofuel is placed on the market; and
- to ensure biofuel is produced and stored according to the most up to date technical standards.

8.2 *Mandatory substitution obligation*

The reduction in excise duty as a fiscal incentive for the uptake of biofuel is not showing itself to be sufficient to achieve the national target for the uptake of biofuels. It is considered that a 'substitution obligation' on all importers and/or wholesalers of petroleum fuel, similar to that in place in other countries, is necessary. The MRA is proposing an annual mandatory substitution obligation¹³ starting from 1.5% in 2011 and gradually increasing to reach the final 10% target by 2020.

This substitution obligation would require importers and/or wholesalers of petroleum to include an amount of biofuel content in any petroleum product that is wholesaled in the inland fuel market. The minimum percentage of biofuel can be ensured either by blending the biofuel with the petrol or diesel or by placing pure biofuel on the market, such that over a period of one calendar year the entire amount of fuel placed on the market has the minimum percentage of biofuel (in terms of energy content) corresponding to the trajectory target for that year. The EU directive provides the methodology and the parameters required to carry out the appropriate technical calculations.

The biofuel placed into the market as part of the mandatory substitution obligation will have to meet the 'Sustainability Criteria' set out in the Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources and described in *Section 6.1.2.2*.

Considering all the above the MRA is proposing the following trajectory for the 2011-2020 period represented in Table 3:

¹³ A mandatory substitution obligation refers to a market situation imposed by regulation where all oil operators/importers operating in a set market are obliged to blend a specific amount of biofuel into their product before placing it on the market.

Table 3 – Substitution Obligation

Year	Total Biofuel as a percentage of the total energy content petroleum fuel placed on the market (%)
2011	1.5 %
2012	2.5 %
2013	3.5 %
2014	4.5 %
2015	5.5 %
2016	6.5 %
2017	7.5 %
2018	8.5 %
2019	9.5 %
2020	10.0 %

MRA is envisaging that during the first three years, the proposed trajectory will be reached through an increased use of biodiesel, with the remaining years seeing the introduction and gradual increased use of bioETBE. The MRA is currently in the process of developing a further strategy for the years 2013-2020. The aim of this strategy is to prepare a framework of how the country could and should react to advancement in the biofuel sector, including more stringent sourcing of biofuels, fluctuations in price and higher feasibility of second-generation biofuels.

Non-compliance with the requirements of the substitution allowance would constitute a breach in the authorisation conditions, leading to a pro-rata penalty imposed on the importer/wholesaler. Such a levy would be calculated based on the energy content biofuel shortfall.

8.3 Regulation charge

In line with self-financing regulation obligations and to ensure the optimum and fair development of the biofuel market in Malta, a regulation charge will be levied on all biofuel retailed in Malta. The aim of the regulation charge is:

- to contribute towards financing monitoring and regulation of the biofuel market;
- to ensure the good quality of the biofuel placed on the market through appropriate sampling and testing.

Such a regulation charge will be commensurate and directly related to the type of regulation and monitoring required.

The MRA will be introducing a regulation charge to finance the monitoring and regulation of the biofuel market.

8.4 Incentives to biofuels

In other EU countries, the introduction of a mandatory substitution obligation implied that the fiscal tax incentive granted to biofuel was removed in favour of the former promoting mechanism. Some countries have done this with immediate effect others have staggered the introduction of full excise over a number of years. In both cases however, the biofuel portion which is not part of the mandatory substitution obligation and which is added on a voluntary basis is still being promoted through other financial incentives.

MRA is proposing a system whereby full or partial excise duty is paid on the biofuel needed to reach the targets set by the mandatory substitution obligation, whereas any additional biofuel which is placed on the market is given some other form of incentive, always provided that the ‘Sustainability Criteria’ set by the EU directives are met.

Although a final decision on any incentive related to biofuel will be taken upon due consideration of feedback resulting from this consultation, the MRA is studying a number of scenarios of how the pricing scenario of biodiesel within the threshold of the mandatory substitution obligation would develop based on different financing schemes. The following table, Table 4, presents three possible scenarios related to full, partial or no excise tax exemption of biodiesel:

Table 4 - Possible scenarios related to full, partial or no excise tax exemption of biodiesel

Option	Excise Duty¹⁴ (€/1000ltrs)	Calculated Retail Price in 2020¹⁵ (€/ltrs)	Calculated Gain/Loss to Consumers based in 2020¹⁶ (€)	Calculated Gain/Loss in Govt. revenue based in 2020 (€)
Option A: Pure Biodiesel component having an excise duty equal to EN590	352.40	1.23	(1,286,875)	-
Option B: Pure Biodiesel component having an excise duty of €200/1,000ltrs	200.00	1.05	(154,041)	(960,028)
Option 3: Pure Biodiesel component having its excise duty fully exempted	-	0.82	1,332,617	(2,219,909)

¹⁴ Based on Current Rates listed in *The Excise Duty Act (Chapter 382 of the Laws of Malta)*

¹⁵ Price is based on KLSE Derivatives (CPO Futures) as provided by CBOT. Downstream cost components were kept constant and assumed to equal those of EN590.

¹⁶ Costing based on 2020 biodiesel substitution obligation of 6.29 Million litres

8.5 Promoting local production

In terms of promoting local production of biofuel local lobbies and biodiesel producers have often stated that locally produced biofuel also creates a number of secondary benefits, such as requiring the collection of waste stream products, job creation and local investment. In view of these facts, they state that indigenous production of biofuel should be positively discriminated against that of imported biofuel. MRA acknowledges the importance of such a resource and will give due consideration in promoting locally produced biofuel.

The MRA is in the process of studying possible ways and means how local production may be promoted in parallel with the general promotion of biofuel.

ANNEX I - POLICYMAKERS AND IMPLEMENTERS

Ministries and government entities that have a statutory role in the Biofuels sector include the following:

Ministries:

- Office of the Prime Minister (MEPA)
- Ministry for Resources and Rural Affairs
- Ministry of Finance, the Economy and Investment
- Ministry for Infrastructure, Transport and Communications

Regulatory entities:

Entity	Major statutory role / mandate	Key responsibilities in the energy sector
Malta Resources Authority	The MRA is a public corporate body with regulatory responsibilities relating to water, energy and mineral resources in the Maltese Islands. It was set up through the Malta Resources Authority Act of 2000. The MRA has wide ranging responsibilities essentially involving regulation of water and energy utilities	Regulation of the energy sector.
Malta Environment and Planning Authority	MEPA is the Authority assigned responsibilities under the Planning Development Act of 1992 and the Environment Protection Act of 2001. MEPA is responsible for the establishment of long and short-term objectives and strategies in the environmental field, for the setting of environmental standards, guidelines and regulations and for the control and management of activities having an impact on the environment through a licensing and permit system. It is also responsible for the promotion and control of proper land development, both public and private, in accordance with approved policies and plans.	Environmental legislation, particularly relating to air quality. Planning development considerations and constraints, particularly those related to new energy infrastructure.
Transport Malta	TM comprises of a Board appointed by Government. In accordance with the Malta Transport Authority Act [XXIII of 2000], the legal functions of the Authority include a requirement for it to plan or provide or secure or promote the provision of, a properly integrated, safe, economical and efficient transport system by road by any means	Energy demand for transport Transport policies that would have an impact on fuel demand / quality

	presently obtainable or that may be available in the future.	
Malta Standards Authority	The MSA was set up in terms of the MSA Act of 2000. Its mission is to effectively co-ordinate standardization and related activities to meet the needs of the Maltese community in accordance with European and internationally recognized standards and practices, which enhance economic efficiency and international competitiveness, and fulfil the community's demand for consumer protection and for a safe and sustainable environment.	Standards relating to energy
National Statistics Office	The NSO came into being in March 1947. It is responsible for the collection, compilation, analysis and publication of a wide range of statistical information and related matters. The NSO is governed by the Malta Statistics Authority Act, 2000.	Statistics related to energy

ANNEX II - SELECTED EU LEGISLATION RELATED TO THIS PUBLIC CONSULTATION DOCUMENT

Regulation (EEC) No 926/93 of 1 April 1993 amending Regulation (EEC) No 1696/87 laying down certain detailed rules for the implementation of Council Regulation (EEC) No 3528/86 on the protection of the Community's forests against atmospheric pollution
Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC
Directive 1999/30/EC of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air
Directive 1999/94/EC of 13 December 1999 relating to the availability of consumer information on fuel economy and CO emissions in respect of the marketing of new passenger cars
Directive 2003/30/EC of 8 May 2003 on the promotion of the use of biofuels or other renewable fuels for transport.
Directive 2004/74/EC of 29 April 2004 amending directive 2003/96/EC as regards the possibility for certain member states to apply, in respect of energy products and electricity, temporary exemptions or reductions in the levels of taxation.
Decision No 280/2004/EC of the European Parliament and of the Council of 11 February 2004 concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol.
Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services
Decision No 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020