# Defining the Objectives of a National Energy Policy for Transport

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## Abstract

This paper examines the objectives and the main elements of a national energy policy for transport based on the experience of such plans in the six Mediterranean EU-member countries. These plans define the energy and Green House Gas emission reduction objectives in the field of Transport which are adopted by each country and provide a guideline for future transport policies. They are strategic energy management plans which have to be aligned with the overall energy plans of the country that define the objectives for reducing the total energy consumption and developing new renewable sources of energy. Furthermore, the paper refers to the potential energy savings and the use of alternative fuels in Transport for the case of other Mediterranean region countries and defines the main pillars of a national strategic plan for energy policy for the Transport sector.

## Introduction: The general framework

All EU member countries are obliged to follow the central policies of the Union as regards the decarbonisation of transport that calls for – among other measures – the reduction and eventual elimination of carbon fuels. A great number of legislative directives have been introduced for reducing energy demand and eliminating Green House Gases (GHG emissions in the Transport sector). The policies were aligned with the EU's flagship initiative "Resource-efficient Europe" set up by the "Europe 2020 strategy" and the "Energy efficiency plan 2011" within which an ultimate reduction (relative to 1990 levels) of GHG emissions of up to 95% by 2050 was targeted. A milestone in the process of decarbonisation was the 2016 strategy for low emission mobility (EC, 2016) and the three packages of the so-called "Europe on the move" (EC, 2017a; EC, 2017b; EC, 2018). These packages came in response to the UN COP21 climate conference in Paris in 2015 but were also due to the realization that the goals set by the previous EU directives and decisions (including the 2011 Transport white paper) were not sufficient to deliver the UN COP21 decisions. The United Nations' Quito 2016 Agreement on the New Urban Agenda and the Sustainable Development Goals have set the framework and made reference to national urban policies to facilitate measures and to adopt approaches for a "smart-city" hosting clean energy technologies.

The Mediterranean EU-member countries are six: Spain, France, Italy, Malta, Greece, and Cyprus. In response to the above EU initiatives, all of the aforementioned countries had to define their own energy and GHG emission reduction plans by 31 December 2019. These plans, though within the overall guidelines and objectives of the EU policies, must also pay due respect to their own national goals and economic conditions. Currently, all six Mediterranean members of the EU have developed strategic energy management plans that set the targets for reducing their total energy consumption, develop new renewable sources of energy, and form strategies for specific sectors including the Transport sector.

This article is concerned with the potential for energy savings and the use of alternative fuels in the transport sector in the case of the Mediterranean region countries, with special reference to the Mediterranean EU member countries. It defines the main pillars of a national strategic plan for energy policy for the transport sector and extends this consideration to a wider context by presenting actual cases.

## Current Energy Policy Status

Mediterranean countries account for 7% of world population and they consume about 8% of the world's primary energy demand. Primary energy demand in the Mediterranean is expected to grow substantially over the next 25 years spurred by sustained population (+105 million compared to 2013) and economic growth (+2.3% of GDP per year on average) in the region (ADEME et al, 2016) The EU member countries account for a high percentage of these figures (i.e., on average approximately 80%). Compared to the very strict and ambitious EU member countries' energy consumption targets, the prospects for the energy consumption outlook for the countries of the Mediterranean area as a whole are considerably less ambitious. In a recent Mediterranean Energy Scenario formulation exercise that covered 25 Mediterranean countries the business-as-usual scenario forecasts a situation that would evolve critically on all counts over the next 25 years, doubling energy demand and tripling electricity consumption, soaring infrastructure and import bills for fossil fuels, and a critical rise in carbon emissions (+45%). Such a scenario, based essentially on fossil fuels, would put further strain on the environment and exacerbate geopolitical tensions in the region. A change of energy trajectory is therefore necessary for all Mediterranean countries to help change current trends and to increase efforts promoting energy efficiency and renewable energies.

An energy transition scenario for the countries of the Mediterranean region was developed in 2016 by the three organisations: *Agence de l'environnement et de la maîtrise de l'énergie – ADEME*, Mediterranean Association of National Agencies for Energy management (MEDENER) and the *Observatoire méditerranéen de l'énergie (OME)*. In this scenario, it was foreseen that by 2040 the Mediterranean region countries should achieve the following goals (ADEME et al, 2016):

- ✓ 30% reduction in energy demand
- ✓ 23% reduction in final energy consumption
- ✓ 27% share of renewables in the energy mix of the region, with renewables becoming the primary source of electricity production
- ✓ Avoiding an additional 200 GW of fossil-fuel based electricity production infrastructure
- ✓ Reduction by 38% in CO2 emissions.

Compared to the above goals, those of the EU-member Mediterranean countries are much more ambitious. In a summary form they are:

- For 2020: 20% reduction in GHG emissions with respect to 1990; 20% of Renewable Energy in energy consumption; 20% reduction in primary energy consumption compared to a baseline projection. A comprehensive legislative package was introduced in 2008 to implement these targets, including mandatory obligations for renewables, energy efficiency, and the application of the Emissions Trading System (ETS), as well as eco-design standards for appliances and CO2 standards for vehicles.
- For 2030: 45% to 46% reduction in GHG emissions with respect to 1990; 32% of Renewables in gross final energy consumption; 32.5% reduction in primary energy consumption compared to a baseline projection. These were determined in 2018 based on the 2016 EC proposal for a comprehensive policy package, Clean Energy for all Europeans. The EU also started implementation of a Market Stability Reserve for the ETS which has already pushed carbon prices significantly upwards in 2018.
- For 2050: Originally a target of an 80% to 95% reduction in GHG emissions with respect to 1990 was set for the EU as a whole, which for the transport sector meant a reduction of 60%. This reduction was later increased to 90% by the Mid-Century Strategy Policy proposal by the EC, put forward at the end 2018. After the new Commission took office (at the end of 2019), a new "green deal vision" was officially declared which involved a 100% reduction: making European transport totally carbon free by 2050.

## Example of an Energy National Plan – The Case of Greece

Most of the necessary legislation is already put in place in EU member countries to a considerable degree and it is characteristic that even for a relatively small and economically troubled EU member country (Greece), the EU's energy transition targets are already part of the national legislation. Due to its economic troubles during the period 2010-2018, Greece experienced a reduction in gasoline consumption of approximately 30% during the five years 2014 – 2018, while diesel consumption has faced a generally upward trend after 2013. In the railways, only 22% of the network was electrified by 2019, placing Greece at the lowest European position of electrified railways with obvious adverse effects in carbon fuels consumption in the transport sector. For maritime transport, crude oil usage showed an increasing trend over diesel, which is also the main maritime fuel for the rest of the EU (YPEKA, 2009). The National Plan for Energy and the Climate (ESEK) for Greece, which was officially adopted on 3rd January 2020, recognizes these facts, and is creating concrete objectives as well as a roadmap (based on scenarios tested by a comprehensive modelling exercise) for the full transformation of the energy sector. Among other provisions, the plan foresees a substantial rise in renewables for electricity generation and transport fuels. Utilizing the sun and the air for electricity production is among the top priorities of the plan, while for transport it adopts all of the aforementioned targets from the EU's guidelines. It also foresees the closure of all coal based electric power production in the country by 2028 – and this date has already been brought forward to 2023 by a recent decision of the government. Greece already produces considerable amounts of alternative fuels to a level of approximately 10%. More specifically:

- *Biodiesel*. The biodiesel production network in the Greek market consists of 16 producers and 5 importers (Government Gazette of the Hellenic Republic, 2020).
- *Compressed Natural Gas (CNG)*. The Public Gas Company is DEPA and its FISIKON gas network is the main CNG distribution in the country. Currently, 14 CNG refueling stations are located in Greece, mainly in large cities, with another 7 planned to be in operation by 2020 (FISIKON, 2020).
- *Liquefied Petroleum Gas (LPG)*. Also known as Autogas, it is the most widely spread gas fuel in Greece used for transport activities with a large number of available refueling stations (more than 1000 all over the country).
- *Electric energy*. Currently there are approximately 140 charging points located in several spots in Greece supported either by FORTISIS, or Blink Europe (FORTISIS, 2020; Blink Europe, 2020), or by form of pilot installations as for example from the Hellenic Petroleum (HELPE, 2017). According to the Hellenic Institute of Electric Vehicles there are several spots existing along the national

highways, but also in a number of public open areas and parking spaces, such as Polis Park.

- *Biogas.* According to the European Biogas Association (2018), Greece has 37 biogas production plants with all produced volumes to be used for generating electric energy

- *Liquefied Natural Gas (LNG).* An LNG storage facility is already in operation on the island of Revithousa for hosting the imported volumes of gas. There are also two more installations planned and under construction in the north of the country (Alexandroupolis area).

Nevertheless, due to the absence of LNG refueling stations as well as appropriate vehicles, the fuel is not currently used for transport activities in Greece.

## Defining goals and objectives of a National Transport Energy Policy

The reduction of CO2 emissions from the transport sector can be achieved through a combination of technical alternatives regarding the engine and the fuel used but also the ways they are utilized and operated. The identification, assessment, and implementation paths for the various alternative actions and policies should be defined within a National Transport Energy Strategic Plan. This plan should be part of a more general Energy and Environmental Policy Plan of the country as a whole that should also be formulated.

The first and foremost ingredient of a National Transport Energy Strategic Plan would be the delineation of the objectives and goals of the national policy in relation to a number of parameters that will define the energy mix for the transport sector in the coming 30 years or so (until 2050). These parameters include:

A. National targets for the reduction in transport related GHG emissions in all transport sectors. For the EU member countries in the region, these targets would be largely set by the EU's policies and legislation already in place as mentioned in the beginning of this article. For the other countries in the region, each government should, by 2022, define these targets within the so-called Nationally Determined Contributions – NDCs that have to be defined as part of the COP21 Paris Agreement of 2015.

B. The national targets for the specific energy mix for the energy carriers in the transport sector that would achieve these emissions reductions.

C. The targets and objectives regarding the fleet mix: i.e. the types of vehicles that will be allowed to circulate in the country. Some European countries are already in the process of proposing a ban on vehicles with internal combustion engines in urban areas after 2040.

All Mediterranean countries must make an intensive effort to improve their energy resources and develop long-term plans, not only in the transport sector. In defining the main contents of a national transport energy plan, the following guidelines are given concerning the main ingredients of such a plan based on previous EU member countries experience.

The new developed plans will provide motives for the use of renewable and alternative fuels. The corresponding EU guidelines and legislation can form a good example for these plans. For the Transport sector the use of hybrid and electrical cars is to be incentivized and promoted by all measures feasible in each country. Measures should also be considered for increasing the use of vehicles supplied by fuels containing larger amounts of biofuels or only biofuels as well as the replacement of older vehicles with new (energy efficient) ones. Also, the plans should provide encouragement in the use of LNG or CNG as fuels in transport, especially in the maritime.

Boosting national production and the use of "clean" fuels in transport is very important for the techno-economic opportunities of a country as well as for the transformation of the cities into "resourceful cities" (Mega, 2002). To reach the set goals and prospects, the country and especially the responsible government ministries should take action to motivate local authorities in implementing measures in cooperation with the private sector. Finally, the major challenge of implementing the energy reduction policies is the clear understanding of the consumer needs and their market behavior whilst managing their social dimensions.

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## Keywords

Energy, transport energy, energy plan, Mediterranean countries, Greece