

National Renewable Energy Action Plan

The National Renewable Energy Action Plan was developed in the framework of the implementation of the European Energy Policy in relation to the penetration of Renewable Energy Sources, Energy Saving and the reduction of greenhouse gas emissions.

In particular, for all the Member States of the European Union, until 2020:

(a) a 20% reduction in greenhouse gas emissions compared to 1990 levels in accordance with Directive 2009/29 / EC,

(b) 20% penetration of Renewable Energy Sources into gross final energy consumption in accordance with Directive 2009/28 / EC and

(c) 20% primary energy savings.

Specifically for Greece, the greenhouse gas emissions target is a 4% decrease in non-marketing sectors compared to 2005 levels and an 18% RES penetration in gross final consumption.

The Greek Government, in the framework of the adoption of specific development and environmental policies, has increased the national target for the participation of RES in final energy consumption to 20%, which is specialized in 40% participation of RES in power generation, 20% heating and cooling needs and 10% in transport.

In addition, with regard to energy saving, Greece has already drawn up the 1st Energy Efficiency Action Plan, which provides for 9% energy savings in final consumption by 2016 in line with Directive 2006/32 / EC, and recently with Law 3855 / 2010, which is added to the recent regulation on the energy performance of buildings - KENAK, proceeds with the development of market mechanisms and the implementation of specific measures and policies aimed at achieving this specific national target for energy savings.

The national energy targets for 2020, as outlined in this Action Plan, but also as formulated by recent legislative interventions and corresponding national programs under the NSRF (*National Strategic Reference Framework*), form a strong business development framework within which Greece is invited to exploit the potential offered by its natural potential in RES & ETS and to develop a new green development model. At the same time, achieving these goals will contribute to the security of energy supply, the optimal use of natural resources and the strengthening of the competitiveness of key sectors of the Greek economy.

This Action Plan details the institutional tools and technologies that will be used to meet these objectives. In particular, the achievement of the objectives calls for a combination of institutional measures and policies to accelerate and facilitate investment initiatives, to establish a clear framework on land use conditions and energy use potential, while calling for all technological applications that can cumulatively contribute to the successful implementation of this green growth model.

The presentation of this roadmap for the development of RES technologies in power generation, heating and cooling and transport was carried out using energy analysis models, analyzing different scenarios of the evolution of the Greek energy system beyond 2020 until 2030, taking and economic and technological development parameters.

The individual scenarios studied for the final selection of the most likely one as the most probable, are different prospects for the development of the country's energy sector and have been divided into two main categories: a) Reference scenarios where the energy system evolves on the basis of already existing (b) scenarios where the

successful implementation of European policy goals for Greece was considered and where alternative energy policy measures were identified and which can be achieved by the National / European objectives.

The key determinants for scenario compilation were the development of economic activity in the country, the evolution of international fuel prices, alternative levels of use of conventional fuels, the impact of RES prices on their penetration and the impact of market interconnections electricity and the development of the electricity transmission system.

The result of this analysis leads to the conclusion that achieving the share of RES in electricity (40%) by 2020 will can only be achieved by the combined implementation of institutional, regulatory, economic and technological measures that have as their main objective the exploitation of the economic potential of large RES projects, the completion of the necessary tasks of expansion and upgrading of the electricity grid and the gradual development of a dispersed mode of electricity generation .

Obviously, this requires addressing a variety of barriers already identified, related to delays in the licensing of RES projects, ambiguities in spatial planning issues, and inadequate information to citizens about RES projects. Greece also presents the peculiarity of existence and an incomplete interconnected electrical system, as many islands are autonomous networks. All these data, constraints and socio-economic parameters have been taken into account in the design of this study, and in planning the contribution of different technologies to electricity generation by 2020.

Respectively, in order to meet the national targets for the participation of RES in heating and cooling, it is foreseen to utilize all institutional changes that have already been implemented or are being launched in order to achieve energy savings by improving energy efficiency and adopting policies for the rational use of energy in all sectors. At the same time, the development of specific technologies, such as heat pumps, as well as the enhancement and further development of applications from solar thermal systems and biomass in both the domestic and tertiary sectors and industry is needed to meet these national targets.

Especially for biofuels, efforts are being made to exploit domestic potential for the production of bio-diesel through energy crops, as well as to develop the necessary biomass management networks for energy use.

In particular, national targets for 2020, in line with the results of energy models, are expected to be met for electricity generation, with about 13300MW of RES (about 4000MW now) deploying all the technologies with prototype wind farms 7500MW, hydroelectric with 3000MW and solar with about 2500MW, while for heating and cooling with the development of heat pumps, solar thermal systems and biomass applications.

The Action Plan details the timing of the penetration and contribution of the individual technologies to electricity, heating and cooling and transport, and links the achievement of these objectives with concrete measures and policies outlined in the relevant sections of the Action Plan.

It is clear from the results of the calculations that the achievement of these objectives requires coordination in actions and measures, market support as well as timely implementation of electricity network development projects so that the energy produced can be absorbed by the RES stations.

The relevant objectives and contribution of individual RES technologies, depending on market developments and timely or non-response to already identified problems, may be amended (as foreseen by the EU Directive) at regular intervals (2-year) as

they will develop a national system to monitor the progress of these goals, recognizing any shortcomings and failures in time, and proposing specific corrective actions of a technological or institutional nature, so that national objectives related to reducing greenhouse gas emissions and further penetration of RES in final consumption achieved.

The National Renewable Energy Action Plan is basically to play the role of a dynamic tool for monitoring national energy targets, where, depending on the measures and policies taken, the response of market players and the technological maturity of RES, so that the binding national targets for 2020 can be achieved, while contributing to the successful completion of the model "Green" development that has been adopted by the Greek government.