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Greek Association of RES Electricity Producers

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Interviewed Experts

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For this country study, the following experts were interviewed in 2014-2015:

- Savvas Seimanidis, Greek Association of RES Electricity Producers (GAREP)
- Panagiotis Papastamatiou, Hellenic Wind Energy Association (HWEA)
- Sotiris Kapellos, Hellenic Association of Photovoltaic Companies (HELAPCO)
- Stylianos Loumakis, Hellenic Association of Photovoltaic Energy Producers (SPEF)
- Myrsini Christou, Centre for Renewable Energy Sources and Saving (CRES)
- Christos Zafeiris, Centre for Renewable Energy Sources and Saving (CRES)
- Konstantinos Karytsas, Centre for Renewable Energy Sources and Saving (CRES)

The Greek RES-E Sector

The RES electricity generation of Greece has been characterised by continuous growth until 2013. The RES-E share was 6.9% of the national total in 2005 according to the National Renewable Energy Action Plan[1] and reached 13.8% in 2012, according to Eurostat[2].

With the adoption of Law No. 3468/2006, Greece introduced a coherent legislative framework for the development and implementation of RES-E projects. Four years later Law No.3851/2010 transposed the majority of the provisions of Directive 2009/28 into Greek Law and reaffirmed the feed-in tariff system as the basic support mechanism for the further development of RES in Greece.

Thus, renewable capacity (mainly wind and PV), supported by a legal framework characterised by attractive feed-in tariffs and the provision of capital subsidies for particular technologies, increased considerably during 2009-2013 (Seimanidis and Konstantopoulos, 2013). However, during this period, the flawed and outdated RES payment scheme in conjunction with the rapid and largely uncontrolled expansion of PV systems in Greece caused an exacerbation of the pre-existing deficit of the Special Account for RES, managed by the Electricity Market Operator (LAGIE) and resulted in acute liquidity problems for the national energy market and mainly for the RES-E producers (Seimanidis and Konstantopoulos, 2013).

As the deficit of the Special Account for RES reached a record high of €551.62 million as of December 2013[3], discussions were already in place for a "New Deal" on RES. Until the time the "New Deal" on RES was finalised and approved by the Greek Parliament at the end of March 2014, RES stakeholders were pretty unsure and reserved, something that was reflected in the Keep on Track Project! (2014 round). Figure and Table 1 shows the development of RES in 2014 (January 2014 - October 2014).

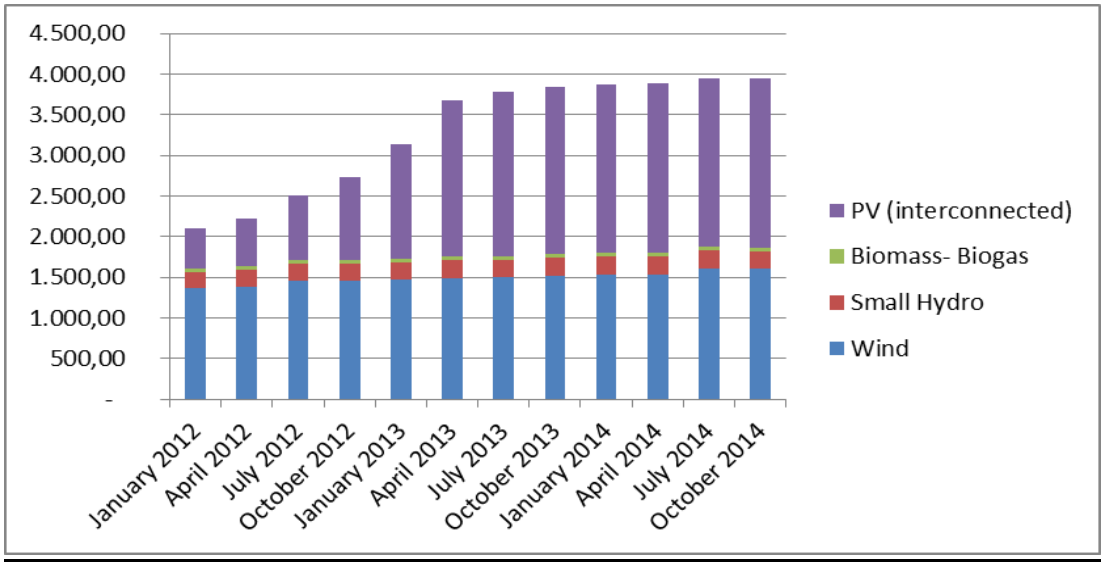

Figure 1: RES Installed Capacity (January 2012 - October 2014). Source: Greek Electricity Market Operator (LAGIE), 2014

[1] http://www.ypeka.gr/LinkClick.aspx?fileticket=CEYdUkQ719k%3D&...
[2] http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=t2020_31&plugin=1
[3] http://www.lagie.gr/fileadmin/groups/EDSHE/MiniaiaDeltiaEL/2014_11_Miniaio_Deltio_EL_APESITHYA.pdf

Installed capacity (MW)	Wind	Small Hydro	Biomass- Biogas	PV (interconnected)
January 2012	1,363.84	205.33	44.53	481.74
April 2012	1,387.84	211.88	44.53	573.50
July 2012	1,453.07	211.88	44.75	801.07
October 2012	1,453.07	212.78	44.75	1,017.97
January 2013	1,465.82	217.88	44.75	1,403.74
April 2013	1,494.72	217.88	45.31	1,921.66
July 2013	1,496.92	217.88	45.56	2,017.06
October 2013	1,519.82	219.84	45.81	2,058.79
January 2014	1,539.62	219.84	46.31	2,073.24
February 2014	1,539.62	219.84	46.31	2,074.42
March 2014	1,539.62	219.84	46.81	2,074.26
April 2014	1,539.62	219.84	46.81	2,074.30
May 2014	1,539.62	219.84	47.07	2,074.30
June 2014	1,576.52	219.84	47.07	2,077.28
July 2014	1,608.72	219.84	47.19	2,078.54
August 2014	1,594.52	219.84	47.19	2,078.97
September 2014	1,594.52	219.84	47.19	2,079.46
October 2014	1,602.52	219.84	47.19	2,079.50

Table 1 and Figure 1 shows that RES in 2014 are on a stabilisation path without presenting the signs of the accelerated expansion the previous years

Support scheme

In Greece, electricity generation from renewable sources has been supported during the past fifteen years through various versions of a feed-in tariff system concept. In addition, RES-E projects had also been eligible for capital subsidies and /or tax exemptions (RES LEGAL Europe, 2014[4]).

Law No. 3468/2006 and its amendments set for the first time an integrated set of rules for guaranteed feed-in tariffs. Plant operators are contractually entitled against the Grid Operator/ Electricity Market Operator to the payment of electricity exported to the grid. The Grid Operator is obliged to enter into these contracts. The amount of the feed-in tariff varies for each electricity generation technology. Based on a regulation issued in the Greek Government Gazette (FEK 1079/2009) the support scheme has been expanded to incentivise electricity generation from small PV installations (capacity of 10 kW or less) through a feed-in tariff, which is deducted from the consumers' electricity bill) (RES LEGAL Europe, 2014[5]). During 2012, feed-in tariffs for PV installations were revised (reduced) twice, while since November 2012 a retroactive levy on the yearly turnover of all operating RES plants has been entered into force. During 2013, a further revision of PV feed-in tariff was introduced. Finally, the so-called "New Deal" on RES was approved by the Law No.

[4] http://www.res-legal.eu/search-by-country/greece/
[5] Ibid.

4254/2014 (amendment of Law No. 3468/ 2006) on 31 March 2014. The "New Deal" on RES included provisions concerning a feed-in tariff review from operating RES and Cogeneration stations with respective modification of the reference prices, a 5 year extension of the purchase agreements for all RES plants operating for less than 12 years , definition of a total capacity level of stations that are under trial operation or stations the connection activated after 1/1/2014 and the obligation of RES producers to issue a discount-credit slip on the total value of the energy sold for 2013 (The discount is defined to 35% for the PV producers and 10% for all remaining RES)(MStR Law Firm, 2014)[6]

Apart from the feed-in tariff mechanism, non-PV RES projects may come under the provisions of Law No.3098/2011 (Investment Law) and can be eligible for a subsidy and / or a tax exemption scheme (RES LEGAL Europe, 2014[7]).

In addition, a net metering system for autonomous PV producers has been introduced for the first time in Greece[8](RES LEGAL Europe, 2014[9]). A Ministerial Decree is expected to regulate the technical details of the scheme, though its approval has been considerably delayed (Energypress, 2014a).

Barriers to the electricity sector

Political and economic framework

The reliability of the general RES-E strategy and that of the existing support scheme, highlighted as a major barrier, is still considered an obstacle for the further development of RES-E in Greece**.** The explosive growth mainly of the PV sector had grave consequences and was not carefully handled by the State. Consequently, a period of instability and uncertainty followed and this situation was described in detail in KoT (2014). The so-called "New Deal" on RES approved by the Law No. 4254/2014 (amendment of Law No. 3468/ 2006) on May 2014 provided a viable solution so as the RES-E sector can be stabilised.

Nevertheless, the "New Deal" on RES was not seen as the final solution to the instability of the sector. The "New Deal" on RES has succeeded in solving the unstable RES-E landscape. However, a coherent RES-E strategy is urgently needed in the context of an updated "Strategic Energy Roadmap" (Seimanidis, GAREP). Such an updated "Strategic Energy Roadmap" should not only take into consideration the current situation of the Greek RES-E sector but also the latest developments at the European level (Seimanidis, GAREP).

In addition, the prospective introduction of the PV net metering support scheme has not been received unanimously with acceptance. On the one hand, it is advocated, that the net metering

[6] Greek: Νόμος υπ' αριθ.4254/ 2014: Μέτρα στήριξης και ανάπτυξης της ελληνικής οικονομίας στο πλαίσιο εφαρμογής του ν. 4046/2012 και άλλες διατάξεις http://www.hfsf.gr/files/legal/22.L4254am18.pdf
[7] http://www.res-legal.eu/search-by-country/greece/
[8] Greek: Νόμος υπ' αριθ.4254/ 2013: Ρυθμίσεις θεμάτων Ανανεώσιμων Πηγών Ενέργειας και άλλες διατάξεις http://helapco.gr/pdf/N4203_2013.pdf
[9] http://www.res-legal.eu/search-by-country/greece/

scheme should be implemented with great caution since the sectoral NREAP 2020 PV target has already been reached seven (7) years earlier. It has also been argued that by definition, net metering should aim at covering the electricity needs of the autonomous producer and that no excess electricity from those producers should be fed into the grid (Loumakis, SPEF). The details of the net metering scheme were open twice for public consultation and the Greek Regulatory Authority on Energy has issued its opinion on it[10], it has also been noted that the net metering scheme will indirectly subsidize new PV autonomous producers, as the electricity netting will be carried out once a year (Loumakis, SPEF). Apart from that, questions are raised as to how the Greek distribution grid can manage a new wave of small PV electricity producers, thus raising questions of grid stability (Loumakis, SPEF). On the other hand, it has been advocated that the net metering scheme can finally restart the PV industry sector on a more stable basis bringing an end to the two year crisis that plagued the PV sector (Kapellos, HELAPCO). Nevertheless, the delay of the issue of the Ministerial Decree is a major barrier as the public will necessarily need time (at least a year) so as to be informed on the new support scheme in place[11] (Kapellos, HELAPCO).

Concerns over the general RES-E strategy have also been raised for other RES technologies such as geothermal energy (Karytsas, CRES). 12 licenses for the exploration of geothermal energy potential in specific areas of Greece and their potential for electricity production have been issued and 8 of them were obtained by the Public Power Corporation S.A. Nevertheless, there seems to be no further prospects for realising such an investment. Furthermore, it should be noted that a general discontent was expressed as far as geothermal energy is concerned (Karytsas, CRES). Despite a number of structural advantages geothermal energy has, certain regions of Greece have some specific characteristics (low depth of rich geothermal potential) that could lower the initial investment cost for the creation of a geothermal power plant (Karytsas and Mendrinos, 2013) and are in every case considerably lower than in other EU countries (Karytsas, CRES). However, there is no electricity production from geothermal energy in Greece.

Revenue risk under the existing support scheme persists as even after the introduction of the "New Deal" on RES. The Electricity Market Operator (LAGIE), established as a public entity under the provisions of Law No. 4001/2011 (known as "Energy Law")[12], is responsible for clearing the daily electricity market and for paying the renewable electricity producers on a monthly basis according to their contractual feed-in tariffs and the electricity they have provided to the national electrical system. This is done through a Special Account (Art.40 Law No.2773/ 1999), set up solely for that reason (RES Integration, 2011). Though the deficit of the Special Account for RES is starting to decrease since the introduction of the "New Deal" on RES, a four month delay of LAGIE's payment to the RES producers can still be observed (Seimanidis, GAREP) In addition, the Electricity Market

[10] Greek: Γνωμοδότηση της ΡΑΕ στο πλαίσιο εφαρμογής του άρθρου 14Α του ν.3468/2006, αναφορικά με τους αυτοπαραγωγούς από ΑΠΕ με συμψηφισμό ενέργειας (Net Metering) http://www.rae.gr/site/categories_new/about_rae/factsheets/2014/major/20102014.csp

[11] This was also the case with the rapid PV expansion during 2010- 2012, where the attractive feed-in tariffs were already in place since 2009.

[12] Greek: Νόμος 4001/2011, "Για τη λειτουργία Ενεργειακών Αγορών Ηλεκτρισμού και Φυσικού Αερίου, για Έρευνα, Παραγωγή και δίκτυα μεταφοράς Υδρογονανθράκων και άλλες ρυθμίσεις". Available at http://www.ypeka.gr/LinkClick.aspx?fileticket=9rVkIH6aN2E%3D&tabid=506&language=el-GR

Operator's commitment to eliminate its deficit by the end of 2014[13] cannot be surely achieved until the need of the next year. This is mainly due to the fact that the Special Account's deficit is decreasing "on paper" (in accounting numbers) but not in reality (Kapelos, HELAPCO). This is due to the complicated process the Electricity Market Operator (LAGIE) receives the Special Account's revenues: Public Power Corporation receives the revenues of the Special Account from the electricity bills and transfers them to the Greek TSO, which finally gives them to the Electricity Market Operator (LAGIE). Due to excessive amount of unpaid electricity bills, Public Power Corporation is unable to give the necessary amount to the Electricity Market Operator (LAGIE) and this is why the Electricity Market Operator (LAGIE) is expect to use legal means so as Public Power Corporation can pay off a considerable amount of money to the RES-E producers (Ημερησία, 2014). This situation is also aggravated by the current unstable political situation in Greece, thus restricting the prospects of a further development of RES-E sector.

Finally, **access to finance for RES-E projects**, a barrier mentioned in KoT (2014), cannot be considered as a barrier as major firms have initiated to secure finance for new projects and it is estimated that € 6.5 billion can be invested in the Greek wind energy sector (Papastamatiou, HWEA). However, the problem remains for other RES such as geothermal (Karytsas, CRES).

Market Structure

The "New Deal on RES" has without any doubt signalled a new era as far as the development of RES-E in Greece is concerned (Papastamatiou, HWEA). This is why the fair & independent regulation of the RES-E sector has been emerged as a new barrier or as a new challenge concerning the development of RES-E. Furthermore, the emergence of the fair and independent regulation of the electricity market is also fueled by the latest developments on the European level.

Firstly, the Greek Electricity Market should be reformed along with the EU Target Model. Public consultation on the reform of the Greek Electricity Market has already been initiated by the Greek Regulatory Authority on Energy[14]. Such a radical requires time but primarily a clear framework that will enable the equal and just participation to the electricity market.

Secondly, the recent "guidelines on State aid for environmental protection and energy 2014-2020"[15] foresees the gradual introduction of market based mechanisms such as feed-in premium (EU Commission, 2014).

Both parameters contribute to the emergence of that barrier. More specifically, two prerequisites are essential for the development of an independent electricity market. The first one is the careful

[13]Greek: Νόμος 4111/2013. Available at: http://www.minedu.gov.gr/publications/docs2013/fek18a.pdf
[14] Greek: Δημόσια Διαβούλευση επί των αποτελεσμάτων της από κοινού μελέτης των ΡΑΕ, ΑΔΜΗΕ και ΛΑΓΗΕ με τίτλο: «Βασικές Αρχές Σχεδιασμού και Χρονοδιάγραμμα Ενεργειών για την Προσαρμογή της Εγχώριας Αγοράς Ηλεκτρισμού στις Απαιτήσεις του Ευρωπαϊκού Μοντέλου Στόχου (EU Target Model)»: Available at: http://www.rae.gr/site/system/docs/consultations/30092014/anak.csp?viewMode=normal
[15] Guidelines on State aid for environmental protection and energy 2014-2020 (2014/C 200/01). Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52014XC0628%2801%29

design of the electricity market (Papastamatiou, HWEA). This is a presupposition of technical nature that has to do with the establishment of a suitable model of an electricity market.

The second and the more important one, is the assurance that the new electricity market will be competitive. More specifically the market should set clear rules concerning its operation and it should facilitate the entrance to new participants (Papastamatiou, HWEA). This is not only a question of policy but it has a so-called "psychological effect" (Papastamatiou, HWEA). In other words, the electricity market should not only be structured but it should also operate as a competitive market, so as all participants are treated equally and indiscriminately (Papastamatiou, HWEA).

Such concerns are raised due to the insufficient progress of unbundling in Greece (Law No. 4001/2011- known as "Energy Law")[16] and RES-E sector is concerned that the Public Power Corporation will retain its monopolistic role in the newly established electricity market, thus impeding the fair & independent regulation of the RES-E sector. Additionally, it is considered that it is the RES-E sector will have serious problems competing in the new electricity market, as the substitution of the current feed-in tariff with the more market based feed-in premium mechanism with auctions does not necessarily allow serious financial margins for RES investors (Seimanidis, GAREP). This is why a delayed and conditional entry of the RES-E sector, e.g. four years from the date the new market becomes operational is proposed by a number of national RES stakeholders (Papastamatiou, HWEA).

Grid regulation & infrastructure

The obstacle relating to the **electrical interconnections and grid stability**, or more specifically the uncertainty for infrastructure development remains as a problem.

The "Ten Year Programme for the Development of the Greek Transmission Grid 2014- 2024"[17] was finally approved by the Regulatory Authority on Energy and has been issued by the Greek (RES Legal Europe, 2013). However, there are currently some problems concerning the upgrading of the existing electricity infrastructure, as many regions such as Peloponnesus in southern Greece are still characterised as "congested" (AEON, 2010) However, this is mainly due not to the real installed RES-E capacity, but to the number of grid connection submissions i.e. to prospective RES-E (Kapellos, HELAPCO). Further problems have also been emerged with the interconnection of the island of Euboia located closely to continental Greece with the continental transmission grid, leaving 500Mw of wind parks unexploited (Papastamatiou, HWEA). In general, it has been argued that grid development in Greece lacks coherence (Kapellos, HELAPCO).

[16] Greek: Νόμος 4001/2011, "Για τη λειτουργία Ενεργειακών Αγορών Ηλεκτρισμού και Φυσικού Αερίου, για Έρευνα, Παραγωγή και δίκτυα μεταφοράς Υδρογονανθράκων και άλλες ρυθμίσεις". Available at http://www.ypeka.gr/LinkClick.aspx?fileticket=9rVkIH6aN2E%3D&tabid=506&language=el-GR

[17] Greek: Δεκαετές Πρόγραμμα Ανάπτυξης Συστήματος Μεταφοράς 2014-2024. Available at http://www.admie.gr/fileadmin/groups/EDAS_DSS/MASM/DPA_2014-2023.pdf

Administrative processes

The **cost and complexity of administrative procedure** was highlighted in the previous report as one of the persistent barriers to the development of RES-E. Nevertheless, it should be underlined that there is the capacity, built through the previous years, to tackle such problems (Papastamatiou, HWEA). Mainly the complexities as far as the administrative processes are concerned have been relocated to latter levels of RES-E project development (Papastamatiou, HWEA). Surely, the stabilisation of the legislative framework has considerably contributed to that direction.

Duration of administrative procedure remains a barrier for the development of biomass/ biogas technologies which is mainly due to the inefficient training of professionals that could not fully understand the character of such an investment that is basically an investment of environmental value (Zafeiris, CRES). Characteristically, despite the fact the Regulatory Authority on Energy (RAE) has allowed the connection of biomass/ biogas plants with a cumulative capacity of 1,000 MW, only 30 MW could finally reach the last stage of their realisation (Zafeiris, CRES). The same problem can also be found in geothermal energy, where the administrative can exceed four years (Karytsas, CRES). Characteristically, one of the licenses that were issued for the exploitation of a geothermal field could not be realised due to that barrier and despite the fact that it was partly financed by structural funds (Karytsas, CRES).

Other

The mixed **public perception,** manifested on a general- public level and on a local level remains, however on a lesser level. As far as the "New Deal on RES" has settled in a more decisive and permanent matter the subsequent increases of the Special Levy for the reduction of GHGs (ETMEAP), imposed on all electricity consumers, the negative stance towards RES-E on that matter is no longer apparent.

Nevertheless, a critical stance towards RES-E remains on a local level. This is mainly caused by environmental organisations that oppose the installation mainly on wind parks, putting nature conservation as a central argument (Papastamatiou, HWEA). However, it should be noted that the respective legislative framework foresees the installation procedure of wind parks near NATURA 2000 Habitats (Papastamatiou, HWEA).

Negative public perception is also considered a serious obstacle for the development of biomass/ biogas. Basically, there is a negative stance towards the realisation of such projects emerging not only from the local community but also from the local administration (Zafeiris, CRES). Concerns related to the possible impacts through the construction of such plants, environmental but also purely economic are risen, thus impeding the further deployment of biomass (Zafeiris, CRES).

Additionally, further problems related to the **training** of professional on the biomass/ biogas sector (Zafeiris, CRES). The inefficient specialisation is basically mirrored in the public sector. As public servants lack the necessary skills, they cannot assess the potential of an investment on that sector. This is why the Environmental Impact Assessment submitted for the construction of an investment is

not approved, thus impeding such investments (Zafeiris, CRES). However, it should be advocated that in contrast with other RES technologies, biomass necessitates constant training so as to remain updated on the latest developments on that sector.

Apart from that, a new barrier mentioned is the **communication between relevant stakeholders**. This is mainly the case for the PV sector, as an unnecessary abundance of PV associations have been established. Surely, every association was aiming at promoting its own interests and could not finally promote their agenda. Finally, the so-called “polyphony” had the opposite effects from those the associations were expecting (Kapellos, HELAPCO).

The Greek RES-H Sector

Regarding the use of renewable energy in the heating sector, Greece has only marginally favoured RES H&C. According to the National Renewable Energy Action Plan[18], as of 2010 Greece had a share of 14.7% in the RES H&C sector. However, the sector has been characterised by an increasing trend, culminating in 2012 with a 24.4% (EEA, 2014).

As it was also underlined in the previous year (KoT, 2014) is the development of the RES H&C sector fairly restricted and it is limited to certain technologies. Concerning solar collectors for hot water production, total installed capacity in 2013 amounted to 2.9 GWth (4.1 million m^2), with a newly installed capacity of 159 MWth (-6% decrease). The sector continues to be affected by the current economic crisis and as building activity remains low, the sector is based again on the replacement of older installations (ESTIF, 2014).

The use of biomass/ biogas in the H&C sector is also fairly limited, and only a number of installations have been realised so far.

Support scheme

RES heating and cooling sector is supported by a tax relief, a number of national programmes and the new investment law (RES LEGAL Europe, 2014[19]).

Tax relief is granted for the installation of renewable boilers or the replacement of existing fossil heating boilers with renewable ones. The Programme "Exoikonomisi kat'oikon" has supported measures to increase the energy performance of residential buildings through the provision of interest-free loans and subsidies for the installation of RES-E and RES-H systems and energy-saving measures. Currently the Programme "Exoikonomisi kat'oikon" is designed for the new Programmatic period 2014-2020 so as to be implemented in the following year, while funding has been ensured for financing the remaining submissions from the previous period (Energypress, 2014b).

Apart from that, the new investment law (Law No. 3908/2011) supports the installation of RES- H plants (RES LEGAL Europe, 2014[20]).

Although Law No. 3908/2011 (Investment Law) states explicitly that PV projects are not eligible for capital subsidies or tax relief support, such support may be provided to other RES projects, especially under the provisions of Art. 6 (General Investment Plans). Art. 6 distinguishes three types of General Investment Plans: General Entrepreneurship, Technological Development and Regional Convergence plans. RES projects are eligible if they come under one of the three categories mentioned above (RES LEGAL Europe, 2014[21]).

[18] http://www.ypeka.gr/LinkClick.aspx?fileticket=CEYdUkQ719k%3D&...
[19] http://www.res-legal.eu/search-by-country/greece/
[20] Ibid.
[21] http://www.res-legal.eu/search-by-country/greece/

Barriers to the heating sector

Political and economic framework

The major barrier reported within this category is related to the **lack of general RES-H strategy and that of a comprehensive relevant support scheme**. It can be considered as a persistent as it was also highlighted in the previous year (KoT, 2014). Main reason for such the continuation is the fact, that the Ministry of Environment, Energy and Climate Change has only acted incrementally towards the support of RES H&C, mainly on the domestic sector with the continuation of the "Exoikonomisi kat'oikon" Programme. However, such support measures are basically characterised as "energy efficiency measures, where RES H&C have a marginal role.

The lack of a relevant support scheme similar to RES-E was further underlined as a barrier for the development of biomass technologies (Zafeiris, CRES). Such a development was deemed necessary for biomass deployment as it was projected that such technologies could follow the development path of the dominant technologies. However, the crisis in the RES sector in 2012 further impeded that development (Zafeiris, CRES).

The reliability of the general RES-H strategy was basically identified as major barrier to the development of geothermal energy for H&C. As it was underlined in the Greek RES-E sector, geothermal energy apart from some technical advantages, the country's rich geothermal potential can surely favour the deployment of that specific technology. Additionally, it was advocated that geothermal constitutes one of the most cost efficient technologies on that field. Despite the fact that geothermal is used in specific applications e.g. heating of greenhouses, there is still an untapped potential considering the prospects of geothermal energy deployment (Karytsas, CRES).

Administrative processes

Lack of integration of RES in spatial and environmental planning is seen as a barrier for the development of biomass technologies (Zafeiris, CRES). This barrier is correlated with other barriers discussed below (see Other).

Other

As it was highlighted in KoT (2014), there are also a number of structural barriers concerning the development of biomass in the RES- H sector. Such barriers were also underlined this year. More specifically, the most important barrier is fuel procurement. There are in Greece approximately 290,000 SMEs that could provide the necessary input, the primary product for biomass plants. However, these enterprises are dispersed throughout the Greek region. Characteristically, for the collection of 100,000 tonnes of primary product, one is should travel to a radius of approximately 150km (Zafeiris, CRES). This has of course a negative impact on the operating costs of a prospective

investment on that sector. As a consequence, almost 18 million tonnes of organic residues can potentially serve as primary input for biomass plants (Zafeiris, CRES).

Furthermore, the absence of a market for biomass products that could enhance the RES-H sector (KoT, 2014) remains a persistent problem. In addition, **lack of coordination between the relevant stakeholders**, i.e. the lack of a unified platform for biomass/ biogas is considered as an important barrier, as there are many instances and secretariats responsible for biomass. Unfortunately, those secretariats are not efficiently coordinated and could not facilitate the promotion of that technology. More specifically, there is no information concerning the exact location of SMEs that could offer their organic residues (Zafeiris, CRES). . Furthermore, there is no knowledge on the quality, quantity and energetic content of those residues. This situation along the problems arising from the integration of those plants in spatial and environmental planning impedes any prospect for the realisation of related investments.

The Greek RES-T Sector

RES-T sector in Greece is continues to have a marginal role in the overall development of the RES sector. As of 2010, Greece had a share of 1.7% in the RES-T sector and this was slightly increased in 2011 (1.9%), placing it in the 23rd place among the EU27 (Ντέμιαν, 2013). The structural problems of the RES-T sector mentioned in KoT (2013; 2014) still remain in place thus impeding the further development of the RES-T sector.

Support scheme

Greece is using a quota system for biofuels. Law No. 3054/2002 obliges producers and distributors of petrol and diesel to blend their fuels with a certain amount ("quota") of biofuels. The mandatory quota is set by ministerial resolution and is reviewed every year (RES LEGAL Europe, 2014). For 2014, 133.000 kiloliters have been distributed (RES LEGAL Europe, 2014)[22].

Barriers to the transport sector

Other

The structure of the biofuel sector in Greece is fairly stabilised since the introduction of the biofuel quota scheme in 2005 (Christou, CRES). There is a number of "big players" along with numerous smaller producers. There were some problems relating to the introduction of the monitoring system, also mentioned in KoT (2014) and introduced for the first time in 2012[23]. Apart from there were some problems apparent with the necessity of biofuel **certification**, however it simultaneously offered possibility for Greek companies to export their biofuel production abroad (Christou, CRES). There are further barriers related to **operational issues**, such as the delay as far as the distribution amount of the kiloliters is concerned. This barrier originates basically from a more structural and basic barrier, which is the **lack of coordination between the relevant stakeholders**. This is mainly the case for farmers and small producers, as the cultivated amount of sunflowers, used as a primary product of biofuels is not instantly known (Christou, CRES). As with other RES technologies, a main barrier hindering the prospects of biofuels is the search for the primary product, with which mainly small enterprises are confronted.

Concerning the prospects of the biofuels sector in Greece, these are fairly limited (Christou, CRES). Only 2% of the RES target is expected to be attained, while Greece is expected to focus on the

[22] Κατανομή έτους 2014 ποσότητας 133.000 χιλιολίτρων αυτούσιου βιοντίζελ, σύμφωνα με τις διατάξεις του άρθρου 15Α παρ. 7 του ν. 3054/2002- Distribution of 133,000 kiloliters of biodiesel in accordance with Art.15A Par.7 Law No.3054/2002 for 2014 http://www.ypeka.gr/LinkClick.aspx?fileticket=%2fKE9vvHyGvA%3d&tabid=292&language=el-GR

[23] Αξιοποίηση του πρώην Αεροδρομίου Ελληνικού – Πρόγραμμα ΗΛΙΟΣ – Προώθηση της χρήσης ενέργειας από ανανεώσιμες πηγές (Ενσωμάτωση Οδηγίας 2009/28/ΕΚ) – Κριτήρια Αειφορίας Βιοκαυσίμων και Βιορευστών (Ενσωμάτωση Οδηγίας 2009/30/ΕΚ). Available at http://www.et.gr/idocs-nph/search/pdfViewerForm.html?args=5C7QrtC22wEbA_BZxkczbHdtvSoClrL8_NSNYUWRl5HtIl9LGdkF53UIxsx942CdyqxSQYNuqAGCF0IfB9HI6qSYtMQEkEHLwnFqmgJSA5WIsluV-nRwO1oKqSe4BlOTSpEWYhszF8P8UqWb_zFijO3N0E4dIN3nXeGSMeNmMJt-DsslFAvw-6Otr1iECr0r

production of biodiesel. More specifically, sunflower oil as well as cotton seed oil (waste oil) is expected to be produced, while the mixture of sunflower with oilseed rape is also planned. Characteristically, areas reserved to sunflower cultivation amounted to 100,000 hectares in 2005, while currently there are approximately 1,000,000 hectares reserved for that reason (Christou, RES).

As far as bioethanol is concerned, any needs are expected to be covered solely by imports. However, it should be noted that there were also plans for the production of bioethanol by the Hellenic Sugar Industry S.A. but they were abandoned due to the financial crisis (Christou, CRES).

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