

# *Impact of the Coronavirus on the Greek Energy Market*

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## Introduction

At this early stage of the crisis, it is fairly difficult to address the disastrous effect that COVID-19 is anticipated to have on the energy markets all over the world. However, it is crystal clear that energy markets have been negatively affected by a huge decline of both supply and demand. This decline is apparent in the volatile oil markets, in the significant slowdown of industrial activity, in the simultaneous decrease of electricity demand, in the delays of ongoing developing projects of Renewable Energy Sources (RES) and in the deterioration of global natural gas trading. This article attempts to provide an early analysis of the ongoing crisis, by reviewing the current state of the Greek energy market and carefully drawing direct links in terms of short and long-term consequences.

## Global Uncertainty

As the coronavirus causes economies around the world to come to a standstill, two issues are most difficult to answer. First of all, what would be a reasonable timeframe for reducing coronavirus expansion that would allow economies to return back to normality and secondly, what would be the overall consequences of this extremely abnormal situation for national economies. Considering the second part, governments and central banks globally provide massive liquidity packages aiming to maintain vital sectors from instantly crashing, since otherwise many companies will default on their debt and a huge domino effect will commence. An aftermath of this support is the duration of such policies that will eventually lead to a fragile highly inflated economic environment.

In that context, the energy sector is expected to be significantly affected in various ways. To begin with, the global oil market is currently facing a toxic combination of low demand and a price war declared by Saudi Arabia and Russia which affects all major producers globally. Another sector that faces severe problems is the RES market, since photovoltaic factories in China have just started to operate in full capacity again after two months of reduced output. In the United States (US), the national photovoltaics association requested to be included in the 2 trillion rescue package that was approved by the authorities. In Europe, many companies have asked for extensions to their project deadlines since the arrival of necessary equipment delays from China.

Moreover, a similar unknown environment holds for the wind market, since wind plants stopped

operating in various regions, while in large markets such as Italy, Spain and France restrictions in workers mobility postpones the development of new projects (Frangoul, 2020). Considering the effect on natural gas, normality is anticipated to return once the Chinese economy is back on track, although a significant decline in total demand for power generation already takes place in Europe and in the US. At the same time, Liquefied Natural Gas (LNG) and pipeline prices are expected to drop at historical levels.

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## Main Implications in Greece

As the majority of countries globally, since March 23, Greece announced a lockdown, restricting movement for all citizens. The strict measures that followed are anticipated to significantly hamper economic growth lead to a huge recession. Aiming to support the Eurozone economy throughout the pandemic, and in contrast to previous rounds of quantitative easing, the European Central Bank (ECB) has decided to include Greek bonds in its 750 billion-euro asset-purchase scheme. ECB has also relaxed its rules, so that banks will be able to post Greek sovereign debt as collateral when they take up liquidity from the central banks. These decisions aim to provide additional stability for the country's financial markets (Guigliano, 2020).

Considering the case of the Greek energy market, national authorities announced a plan that could act as a guarantee mechanism for energy suppliers, aiming to provide a cushion towards the imminent liquidity shocks. The majority of energy companies are offering discounts on energy bills but, at the same time, face the possibility of increased arrears. Interestingly, CO<sub>2</sub> and LNG's low prices provide incentives for the thermal plants of the Public Power Corporation (PPC) to be more competitive and operate in reduced cost. On the other hand, the drop of CO<sub>2</sub> price triggers some positive and negative effects:

- A positive effect comes for electricity suppliers who buy electricity quantities in lower price comparing to previous market price levels, thus increasing their profit at least until competition bring prices to equilibrium. Average wholesale monthly system marginal price has decreased by more than 20€/MWh comparing to 2019 levels,

without considering the effect of CO<sub>2</sub> emission drop. According to the Hellenic Association of Photovoltaic Energy Producers (2020) this will result to a decreased costs of at least €700 mil for all electricity suppliers sector, for 2020.

- A negative effect comes to RES producers who are receiving their revenues from the Specific RES Account managed by DAPEEP. Important inflows to RES account are (i) the wholesale market revenues and (ii) the RES levy. Both are affected during this period and based on the Hellenic Association of Photovoltaic Energy Producers (2020) estimations, this deficit could reach 423 mill euro at the end of 2020.

### 3.1 Oil and Refining

Below we provide, the most important negative consequences that the sector currently faces:

A significant drop in fuel sales in the domestic market, mainly due to a reduction in the demand for aircraft fuels (up to 100%), for gasoline (up to 70%) and for diesel (up to 50%).

Reduced exports in almost all countries

- Companies operate with the least possible staff to ensure the uninterrupted operation of the facilities and the supply of the market. This also leads to the limitation of parallel daily activities, such as the execution of projects and the development of new investment plans. Difficulty in dealing with issues of operation and maintenance that require the presence of specialized foreign technicians due to travel restrictions. However, this limitation could be withdrawn in case of emergency.
- Delays in the delivery schedule of spare parts and equipment.
- Delays in the licensing of mature investments that directly affects future cash flows.
- On the other hand, a couple of positive consequences are apparent as well:
- Households obtain huge amounts of oil for heating purposes, which due to the extremely low prices is attractive and many consumers aim to take advantage of it for next winter season. Since the beginning of the year, heating oil prices has shown a significant reduction from 1.07 euros/liter to 0.815 euros/liter.
- Companies can supply raw material for the operation of refineries at lower prices.
- Increase of raw materials and products so that the smooth return to pre-crisis conditions is not gradually affected.

In order not to disrupt the supply of this vital fuel to the market, companies that operate in the oil sector propose the simplification of the licensing process for the operation of ready-made investment projects by issuing a temporary electronical license, only for the period when restrictive measures applies.

### 3.2 Electricity

The consequences of the COVID-19 outbreak towards the companies and employees of the electricity market are numerous as well. First of all, part of the commercial, business and supply chain activities have been suspended. In parallel, thousands of job positions have been affected, and this negatively impacts economic output and prosperity. Aiming to guarantee security supply, the majority of electricity companies took instant measures throughout the generation chain and at the most critical infrastructures. Indicatively, the companies characterized specific areas (such as, unit control rooms and mines) as critical with controlled entry and mandatory use of protective equipment for the employees. Next, a classification of staff into categories (critical, supportive, alert) followed, and units maintained only the emergency staff on a rotating basis.

No particular problems have been reported so far in the supply chain. However, the constant operation of companies that supply the facilities with materials for continuous consumption (chemicals, lubricants, etc.) or other critical materials (especially when they are necessary for the implementation of station maintenance) is vital for the smooth functioning of thermal plants. This issue becomes more serious in the case of supplies coming from other countries or the when there is a need to send spare parts abroad for inspection and reconstruction. Another possible problem might rise from the restriction of travels that may affect the availability of units on non-interconnected islands. During the summer season, where normally a demand peak is observed, the availability of units may be reduced to a greater extent. Hence, given the current circumstances of high uncertainty, it is necessary to carefully forecast the load demand of the upcoming months. Besides, the strict measures created serious problems in a number of investment projects that heavily impacts their schedules and costs.

Another major issue is the fact that the implementation of the Target Model, that was initially designed to begin in June 2020, is anticipated to take place by a two- or three-months delay. In terms of commercial operations, the majority of electricity companies introduced discounts for their clients and allowed more than 85% their staff to work from home. Aiming to better serve the public, the service provided by call centers were extended to 14 hours per day and at the same time employees at the specific department increased by 50%. The main issue that will arise in the upcoming period for all electricity suppliers is the lack of liquidity, since, by the begging of March 2020, a reduction greater to 20% have been recorded in terms of collectability.

Regarding RES, the delay in development and licensing procedures for new investments is the most important issue that affects sector's growth. Under development RES projects who secured tariff through a

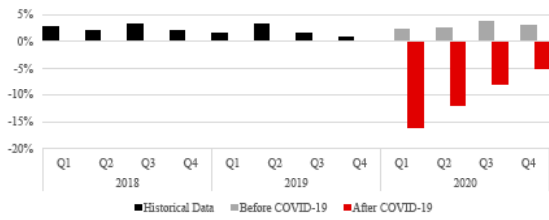


Figure 1: Quarter Change in GDP Growth Rate in Greece (%)  
Source: Hellenic Statistical Authority and Authors' Estimations

tender face strict connection deadlines, with the risk of bank guarantees forfeiture. A recent legislative act have extended deadlines and licenses duration

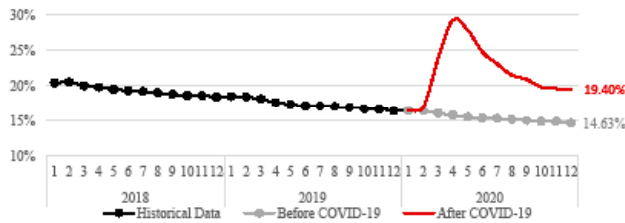


Figure 2: Unemployment Rate in Greece (%)  
Source: Hellenic Statistical Authority and Authors' Estimations

covering most of the cases, but still, this act needs to be extended to all cases. It should be noted that no force majeure event has been predicted on RES tender rules to protect successful tender bidders. National authorities need to guarantee flexibility for the development and completion of renewable projects.

Besides, Greece should support EU fund to

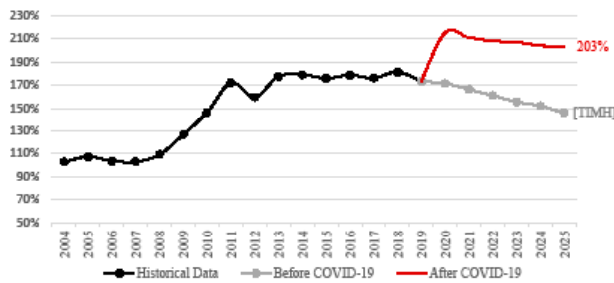


Figure 3: Government Debt as Share of GDP in Greece (%)  
Source: Eurostat and Authors' Estimations

encourage additional national renewable energy auctions and freeze degressive support schemes. Aiming to support financing and liquidity of RES market, the government should create a compensation scheme for RES developers and project owners for additional project costs due to the crisis. The RES levy should become a part of the competitive charges instead of being a regulated charge, at least as a temporary measure activated during this crisis. Furthermore, Greece should support to the European Commission SURE program as a job retention scheme.

In overall, the adverse effect has already been

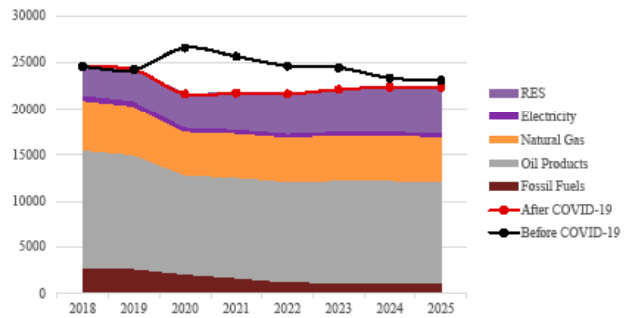


Figure 4: Evolution of Gross Energy Consumption in Greece (ktoe)  
Source: National Plan for Climate & Energy and Authors' Estimations

apparent mainly through the significant reduction in electricity demand, which is more than 15% on average, compared to the same period a year ago. At the same time, the reduction in companies' revenues

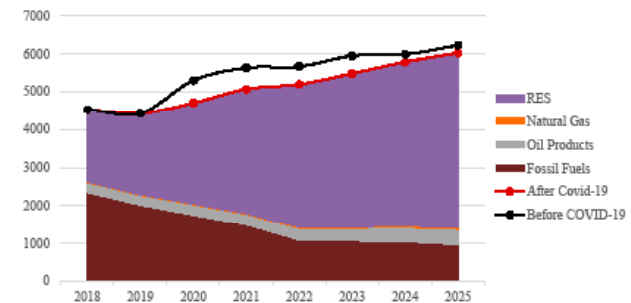


Figure 5: Evolution of Primary Energy Production in Greece (ktoe)  
Source: National Plan for Climate & Energy and Authors' Estimations

is estimated to be more that 20%. Based on the above, we argue that electricity suppliers should be strengthened by government interventions, especially with measures that will improve liquidity, such as a generous reduction in corporate tax.

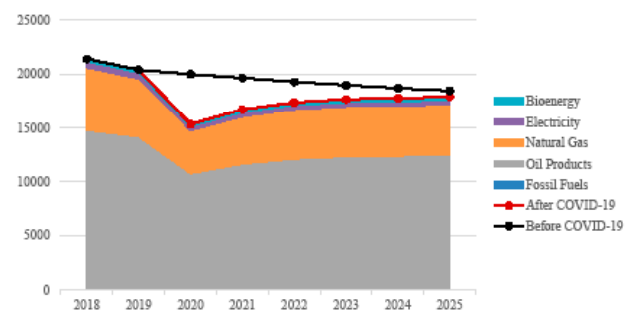


Figure 6: Evolution of Net Energy Imports in Greece (ktoe)  
Source: National Plan for Climate & Energy and Authors' Estimations

### Economic Outlook

Based on national authorities' estimations, the quarterly GDP growth rate prior to the outbreak of COVID-19 was projected to be 2.8% on average for 2020. However, based on IMF's recent estimations

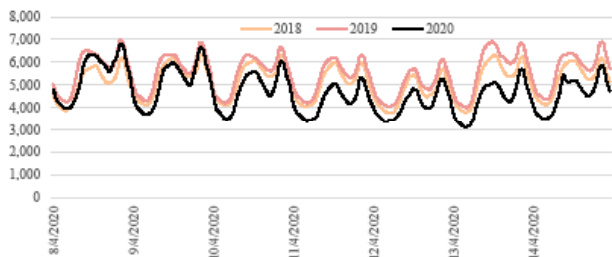


Figure 7: Historical and Current Data on Electricity Load in Greece (MWh)

(IMF 2020), the projection following COVID-19 will lead to an average annual decrease of GDP by 10%. The projection for unemployment rate is expected to

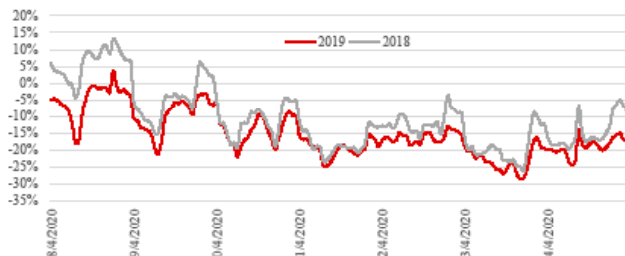


Figure 8: Change in Hourly Electricity Load in Greece (%)  
Source: HEnEx and Authors' Estimations

face a short-term inverted U-shaped curve. Based on IMF's estimations 235.000 jobs will be lost during the upcoming months, leading to a yearly unemployment

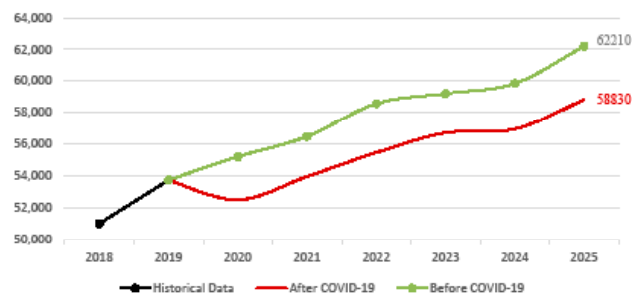


Figure 9: Evolution of Total Demand for Electricity in Greece (GWh)  
Source: National Plan for Climate & Energy and Authors' Estimations

rate of 22.3% for 2020. The projection for 2021 is that unemployment will stand at 19%.

The projection for the government debt as share of GDP before the outbreak of COVID-19 was based on

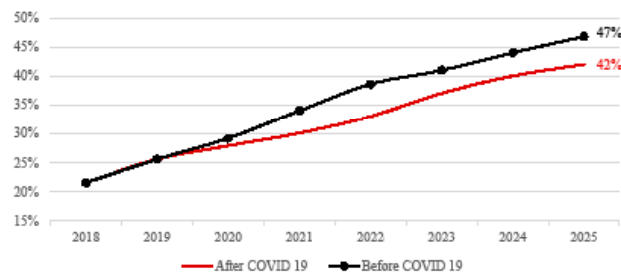


Figure 10: RES share in Gross Electricity Consumption in Greece (%)  
Source: National Plan for Climate & Energy and Authors' Estimations

estimations provided by the International Monetary Fund (IMF, 2019) and the recent Greek budget (2020). However, we anticipate a significant increase in the percentage of debt to GDP by more than 30% compared to 2019 levels.

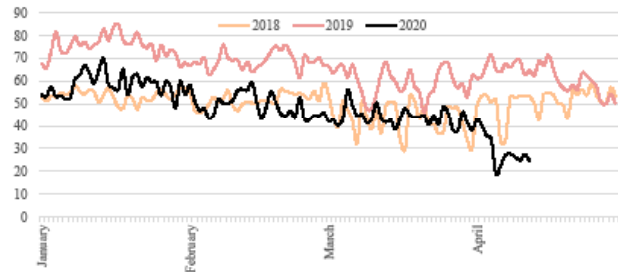


Figure 11: Daily Electricity Price in Greece (€/MWh)  
Source: HEnEx and Authors' Estimations

### Energy Market Outlook

Gross energy consumption in 2020 is anticipated to decrease by almost 11% in 2020 but compared to prior

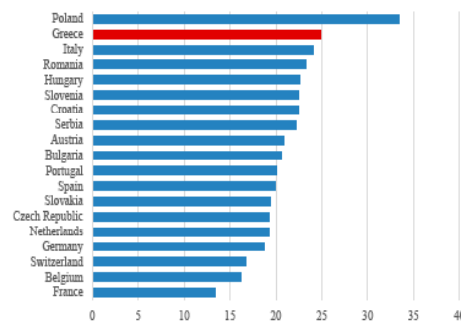


Figure 12: Daily Average Electricity Price for Selected Countries (€/MWh), [5/4/2020 - 12/4/2020]

Source: EPEX SPOT, IBEX, OPCOM, OMNIE, CROPEX, GME, ENTSO-E, HENEX, SEEPEX, SOUTHPPOOL and Authors' Estimations

projections the reduction is up to 18.5%.

However, in the long run, this gap between the two projections will gradually decrease, reaching at almost identical level by 2025. Throughout this period, it is apparent that consumption from RES will increase while energy consumption from fossil fuels will

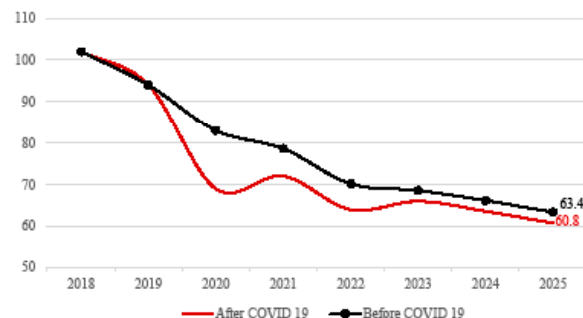


Figure 13: Evolution of Total CO2 Emissions in Greece (MtCO2)  
Source: National Plan for Climate & Energy and Authors' Estimations

decrease.

Despite the COVID-19 crisis, primary energy production in Greece is anticipated to follow an upward trend that is however hampered by 11.3% compared to prior projections. By the end of 2020, RES are anticipated to represent 75% of total energy produced in Greece. Regarding the evolution of net energy imports, we anticipate a huge drop for 2020 and a gradual increase during the upcoming years.

Figure 7 depicts the total electricity load during the second week of April compared to the same variable during 2019 and 2018. The relationship between economic growth and electricity consumption is well documented by prior research (Narayana and Prasad, 2008). In that context, Figure 8 illustrates the change in hourly electricity load for Greece. The maximum reduction was recorded during 13th of April 2020 by 28.45%, and the average reduction for the week under examination is 10.54% and 15.24% compared to 2018 and 2019 levels respectively.

Total demand for electricity in 2020 is expected to lower by 2.2% compared to 2019 levels, and then it is expected to follow an upward trend. Besides, due to significant delays in licensing procedure of RES projects, an overall decrease of 5% is projected to take place in RES share in gross electricity consumption by 2025.

Daily electricity prices in Greece are substantially lower compared to 2019 levels. A historical minimum of 18.7€/MWh was recorded during the first week of April 2020. This is interpreted as a 70% decrease compared to the price of 64€/MWh that was recorded for the same day in 2019.

Despite this sharp drop in electricity prices, a comparison among various EU countries reveals that during the second week of April 2020, Greece faced the second highest electricity price, with a daily average price of 24.8€/MWh.

Finally, on the positive side of the current crisis, the total amount of CO<sub>2</sub> emissions in Greece is expected to sharply decrease in 2020, however, as the economy will progressively return to prior levels, a slight increase will follow in 2021. In overall, a downward trend will follow until 2025, reaching the level of 50.8 MtCO<sub>2</sub> which is slightly below the value of prior projections.

## Conclusions

This paper focused on national perspectives after the outbreak of the COVID-19 in the Greek energy market. During this unprecedented crisis, all sectors of the economy, both at local and global framework, will need rapid measures and direct actions towards recovery. The energy sector will certainly need significant support

aiming to reach again the prior levels of demand and supply. In that context, the progress of the Greek energy sector depends to the greatest extent on new investments. The evolution of investments depends on the economic climate, which will significantly be affected by total consumption. Inevitably, total consumption will also be affected, hence the necessity for state mechanisms assistance in the field of liquidity, licensing, legislation, approvals and bureaucracy is more than vital.

Under such times of emergency, government interventions must display a quite different behavior from the way we have been accustomed to so far. Sooner or later, the economic climate will improve, and consumption will return back to normal. In the meantime, market participants must be ready to immediately restart their productive and investment activities. Strategic projects and large investments face time-consuming bureaucratic issues that still hold these projects away from being implemented. Namely, East-Med, Kavala underground gas depot, the exploration for the exploitation of hydrocarbons in Western and Southern Greece, plethora of RES projects, the installation and operation of offshore wind turbines and cable interconnections, are only a few examples of potential investments in the Greek energy sector. In that context, the most efficient way to support those investments and at the same time assist economic growth is to simplify and speed up the legal and bureaucratic procedures. Otherwise, the significant positive momentum that the Greek economy had gained after a decade of severe crisis, will be lost again, with devastating consequences for the society.

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