

UNOFFICIAL TRANSLATION FROM GREEK

**To**  
**Ministry of Environment and Energy**  
119 Mesogeion Ave.,  
101 92, Athens  
Attn: Mr. Minister, Prof. G. Stathakis

**SUBJECT: Public Consultation on National Energy and Climate Plan (NECP)**

Athens, 03.12.2018

Dear Minister,

The European Union has set, with regard to energy and climate policy, as its key objective to reduce greenhouse gas emissions by at least 80% in 2050 compared to 1990. The priority of reducing GHG emissions is clearly recognized by Greece's National Energy and Climate Plan (NECP), which is currently under consultation, already in the foreword of the text (page 5) as well. The European Council agreed in October 2014 that the 2030 EU interim target would be to reduce GHG emissions by at least 40%. In June 2018, the Council of Ministers and the European Parliament agreed that in 2030 the share of renewable energy sources in final energy consumption in 2030 would be at least 32% and energy consumption in the EU in 2030 would be at least 32.5% lower (compared to the 2030-consumption forecast made in 2007). At the same time, the European Commission and the European Parliament have set a 2030-target that each Member State's interconnection transmission capacity - for imports - should be at least 15% of the total installed capacity of each Member State. Beyond these four EU energy and climate goals for 2030, the international community has committed in 2015 - with the Paris Agreement - that the rise in average Earth temperature should be much lower than 2 °C. In 2015 the UN also adopted the Sustainable Development Agenda and its 17 Sustainable Development Goals for 2030 - each of which is specialized in a series of very specific and practical sub-goals. Goal 7 requires everyone in 2030 to have access to affordable, reliable, sustainable and modern energy. Goal 13 requires urgent action to tackle climate change and its impacts. Based on this European and international context, the International Energy Agency (IEA) has developed, in its World Energy Outlook in November 2018, the Sustainable Development Scenario in order to achieve these goals. This scenario foresees that in 2040 Renewable Energy Sources (RES) will cover 67% of global electricity production. In this European and international context, our country is called upon to develop its own long-term energy planning and submit within 2019 a final Energy and Climate Plan for 2030 to the European Commission, according to the new Regulation on the Governance of the Energy Union.

The Hellenic Association of Independent Power Producers (HAIPP) believes that the NECP for 2030 should have a dual main objective: on the one hand the NECP must lead to the achievement of the European targets for the reduction of GHG emissions, the increase of energy efficiency and the penetration of renewables into the energy mix while safeguarding the country's security of supply in electricity and natural gas and, on the other hand, it has to transform the energy and environmental sectors of the national economy into a basic feeder of high growth rates that have to be achieved in the coming years, as we all recognize.

Having this this dual goal as a key driver, HAIPP believes that the electricity sector in Greece should follow the commitment of the European electricity industry – as expressed by Eurelectric - to produce and supply electricity with zero total GHG emissions (net-zero GHG emissions) in the EU by 2045. This Eurelectric's goal is in full agreement with the strategy published in November 2018 by the European Commission for a zero-emission GHG economy in 2050. In all the scenarios depicted in this report, the EU's energy sector is heading towards net-zero GHG emissions in 2050. Electricity and electrification of energy end-use in several sectors (eg transport, heating) significantly contribute to this effort. Indeed, all scenarios included in the Commission's long-term strategy for 2050 foresee an increase in electricity produced in 2050 in the EU between 35% and 150% (i.e. an average annual increase of about 1% to 2.9% depending on the scenario) compared to current levels. Accordingly, the results of Eurelectric's recent "Decarbonisation Pathways" (November 2018) forecast an average annual increase in electricity demand in the EU between 1.4% and 2.1% for the period up to 2050 (to reduce EU GHG emissions by 80% to 95%, respectively, compared to 1990).

For our country this means that lignite-fired electricity should be gradually reduced over the next few years (as efforts to achieve climate targets will worsen the finances of this activity), as it is already the case, with the share of Renewable Energy Sources growing and natural gas (in its various forms) functioning as the strategic bridge-fuel during the transition period until 2050 because it:

- provides the necessary flexibility and reliability to meet the variable and/or stochastic production of renewable sources
- exploits the geostrategic position of the country, which is expected to become a powerful regional hub with the construction of new gas pipelines
- offers the possibility of investing in more efficient cutting-edge technologies for the gradual and planned substitution of lignite production

In particular, the issue of flexibility lies at the heart of the pan-European electricity market. It is precisely this flexibility regarding the functioning of electricity markets and systems that European Regulations 2015/1222 for the intraday market and 2017/2195 for the balancing market aim to ensure. For its part, the European ENTSO-E Operator has reformed the traditional approach to the issue of security of electricity supply by including the objective of safeguarding adequate flexible capacity - from every available source such as flexible dispatchable generation, demand response, storage and cross-border trade - in its annual pan-European adequacy study. The increased need of the European electrical systems for flexible capacity sources is clearly reflected in a recent (October 2018) study conducted by Accenture. This study foresees that in six EU Member States (Germany, France, Spain, the Netherlands, Ireland and Great Britain) an additional 55-90 GW of flexible capacity will be required by 2030. Obviously, similar requirements will exist in other EU countries with very high penetration of variable RES.

Based on the above facts, it would be expected that Greece's draft NECP would capture - as far as electricity is concerned - a clear picture of the transition from the current situation - with lignite, natural gas and RES having about 1/3 share in the coverage of demand in the Interconnected System - in the new where electricity will mainly be produced from RES with natural gas running transitionally as the main fuel for the residual dispatchable units. This picture seems to be shaping up in almost all EU countries by 2030. However, the draft NECP gives a vague picture - as it is reflected in Chapter 5 and in the Appendices to the results of the energy models - and we believe this is mainly due to the assumptions that have been used and which - as explained in detail below - will necessarily have to be updated within the framework of the final NECP (which has to be submitted by Greece to the European Commission before the end of 2019). In any case, it is not reasonable that after a twelve-year long extensive implementation of actions and policies regarding decarbonisation of the energy mix, the lignite to natural gas ratio in electricity production will remain unchanged in 2030 –i.e. at 1: 1- compared to 2017.

Taking into account the general European and international context as well as the main remark on the fundamental issue of the assumptions used, HAIPP wishes to submit the following remarks on the individual chapters of the National Energy and Climate Plan:

- 1) Chapter 2, page 8: Table 1 is inscribed as "Installed Capacity" but it seems to reflect rather the net capacity of the lignite and gas-fired units and not the installed one. Similar clarification is also required in other parts of the text of the NECP.
- 2) Chapter 2, pp. 31 & 87-88: Regarding the description of the current situation in the Greek electricity market, the draft Plan has to emphasize that the market design remains incomplete as an organized market operates only on day-ahead timeframe and the branches of forward, intraday and balancing markets are absent. This incomplete design of the Greek electricity market leads (in combination with the persisting structure of the market participants) to the inability to reveal the actual -at each time point- value of the electricity commodity. The consequence of this is the difficulty of the Greek Electricity System to ensure the necessary imports of electricity in times of scarcity in the Greek market (for example during the recent energy crisis in December 2016-February 2017). The absence of market coupling between the Greek electricity market and the neighboring markets of EU Member States (i.e. Italy and Bulgaria) should also be reflected in the NECP.
- 3) Chapter 3, p. 39: The NECP text states that the main objective is to design and schedule the policies and measures that will contribute to the achievement of the energy and climate objectives. However, the NECP text itself only briefly mentions, in Chapter 6, on policies and measures. Regarding the scheduling of the measures, there is no timetable for their implementation. On the contrary, it seems that the main focus (in addition to the detailed mapping of the current situation) during the preparation of the NECP was on defining the targets and on implementing the baseline scenario by applying the energy and economic models used.
- 4) Chapter 3, pp. 41-42: We observe that in all three sectors (GHG emissions, RES contribution to energy mix and energy efficiency), the values achieved by the implementation of NECP's basic (and only) scenario are higher than national targets (as referred to in the NECP). We believe that this positive deviation should be justified on the basis of e.g. GDP growth and / or the increase in employment achieved with these higher values in these three objectives. Furthermore, we consider it particularly positive to include in Table 2 the quantitative targets for the reduction of certain atmospheric pollutants in the NECP and we believe that the final Plan, to be submitted to the European Commission in 2019, should include a table and / or report that the implementation of the basic NECP scenario (and the results included in the Annexes) is in line with the limits set out in Table 2 of this draft Plan.
- 5) Chapter 3, p. 46: HAIPP believes that the NECP should be clearer and more specific as regards the interconnection of the Aegean islands with the mainland system. In particular, while it is stated in Section 3.3.1. that the aim is the interconnection of almost all the islands until 2029/30, on page 177 of the text it is stated that the feasibility of interconnection of the Aegean islands is under investigation and then Table 209 shows that the interconnection of the islands of the North Aegean will be operational in 2031. This ambiguity should not exist in the final Plan. HAIPP believes that the interconnection of all the Aegean islands (with the exception of some very small systems) is an undisputed need in order for Greek households and businesses to stop being burdened with the overwhelming cost of services of general interest (SGIs) and in order to exploit the rich potential of RES in the islands. In addition, it is now a great opportunity for the islands interconnections to be realized at a reduced cost to the consumers in Greece. Specifically, as rightly mentioned in the draft NECP, there is the possibility of financial support for the construction of the island's electrical interconnections with revenues from the auctioning of up to 25

million EUAs from the European reserve of the EU ETS. In addition (and this is not mentioned in the NECP and in particular on pages 176-177), the Attica-Crete interconnection can be carried out as an EU Project of Common Interest (PCI) and can receive financial support from the CEF (Connecting Europe Facility). For all these reasons, the NECP should include time-plan for the construction and operation of the interconnections of the islands (apart of Crete, which is planned to go live in 2022) long before 2030.

- 6) Chapter 3, p. 50: It is indisputable at both European and national level that the operation of open and competitive markets leads to a cost reduction for consumers. The data from both Eurostat and Eurelectric show that the electricity generation and supply component is the only one (due to increased competition in coupled European markets) with downward trends over the last years across the EU, while the bill is burdened by tax/levy components and networks charges. This applies also on the Greek retail electricity market where consumers in recent years have access to cheaper tariffs (for the competitive part of energy) in the face of the strong competition (albeit limited yet in market shares) that has been achieved through the numerous electricity suppliers. At the same time, the existence of well-designed and well-functioning electricity markets is a sine-qua-non for achieving the high penetration of RES into the energy mix as they will provide in the coming years the framework for renewable energy projects to be developed without the need for financial support. Additionally, the well-designed and well-functioning markets will allow (in particular the balancing market) the covering of significant fluctuations stemming from very large amounts of power and energy from variable RES (wind, PV).
- 7) Chapter 4, p. 78: The NECP text states that the seasonal storage of Liquefied Natural Gas (LNG) (for the fulfillment of the generation license clause of certain power producers) was considered technically not feasible. However, the full and correct statement (as included in both the Preventive Action Plan for Gas and the Gas Emergency Plan) is that a certain capacity of the Revythousa LNG plant will be utilized for the LNG seasonal storage (Dec.-Feb.) for electricity generation of these certain units. This LNG storage capacity corresponds to the full load operation of these units for 16 hours per day and for 5 days (action Δ5 of the Preventive Action Plan).
- 8) Chapter 4, pp. 90-93 & 189: As far as the operation of both the existing and the future electricity markets is concerned, it is particularly important that the State acknowledges (as reflected in the NECP text) that the correlation of the bidding price threshold for hydro power units with the scarcity of water in reservoirs has resulted in increased competition in the wholesale electricity market. The same acknowledgement applies for minimum variable cost rule. Taking into consideration that there is no plan to reform the market structure regarding the large hydro power units, HAIPP believes that the methodology for determining the bidding price threshold for hydro units must remain during the operation of the new electricity markets as well. Thus, this methodology should be included in both the Regulation of the Hellenic Energy Exchange Energy and the Regulation of the Balancing Market. In addition, our Association believes that much attention should be paid to the selection of parameters relating to the operation of the new electricity markets, especially during the first phase of their operation. In particular, it should be ensured (from the beginning on) that the day-ahead market maintains sufficient liquidity so that its prices actually reflect the short-run cost of electricity production and that there are no situations where certain units, although possibly more expensive, will operate as a matter of priority through their pre-allocation by the dominant player to serve forward and bilateral contracts. In addition, (and this issue is also related to security of supply) the TSO should determine the necessary quantities for the operation of the Electrical System in the Balancing Market in accordance with the requirements of the European Regulation 2017/1485.  
With regard to the current NOME electricity auction mechanism, we believe that the reference in the text of the NECP to its substitution should be accompanied by a specific plan of when and how (market tools and/or structural reforms) this substitution will be done.

- 9) Chapter 5, p. 103 & Chapter 6: The draft Plan contains only a scenario of the country's economy and energy development. This is not a usual practice for long-term development studies of any energy system. Typically, the European Commission's long-term energy and climate strategy (November 2018) for 2050 includes eight scenarios. We therefore believe that Greece's final NECP should include at least two scenarios where the first one will apply existing and already planned policies and the second scenario will add the new policies needed to achieve (or overcome) national targets in 2030. In its present form, the NECP does not make how far the existing and planned policies would bring Greece's energy system and what remaining distance is supposed to be covered by new policies and measures such as the ones described in Chapter 6.
- 10) Chapter 5, p. 105 & pp. 207-208: The issue of the assumptions used for the baseline scenario is of paramount importance. The Regulation for the Energy Union Governance requires Member States' national plans to be based on robust and coherent assumptions as well as to make publicly accessible essential information on the assumptions used. We consider that both these conditions are absent from the draft NECP and we consider it necessary that they will be met in the final Plan to be submitted by the country within 2019.
- More specifically, no information on the sources used and / or justification for the selection of these sources is given. We believe that the final NECP should have a detailed list of all sources used, the justification and information as to whether the assumptions used by the Greek Plan come from a common set of assumptions used to draw up the Plans of other Member States as well. It would also be positive to have all the assumptions, used each time by NECP, available to all interested parties in an editable format (eg Excel file).
- With regard to the assumptions used in this plan, we see that GDP growth over the period 2016-2030 implies an average annual growth rate of about 1.9%. The plan itself, however, at p. 2 refers to growth rates above 2%. As far as the fuel and emission allowance (EUA ) assumptions are concerned, it is understood that these come from the EU Reference Scenario 2016. However, as we are already at the end of 2018 and the assumptions of this scenario date back to 2015, there is a pressing need to update these assumptions, as the current long-term projections (CO2 prices and fuel prices) are significantly different from the ones used in the baseline scenario of the draft NECP. Besides, even European Commission has in the meantime adopted the long-term strategy for 2050 which is apparently based on a different set of assumptions (excluding the baseline scenario). The need for updating the assumption is highlighted in the case of natural gas prices where the draft Plan assumes prices around 38 Euro/MWh in 2030 when the forward price on the TTF for 2019 is 22 Euro/MWh and for 2023 is 17.5 Euros/MWh (a clear downward trend). In addition, numerous new gas liquefaction projects are expected to operate in the next few years on a global scale, thus significantly increasing the overall supply of natural gas. It should also be stressed that the IEA annual report (WEO 2018), published at the same time as the NECP consultation, has natural gas prices in Europe in 2030 at about 23-24 Euro/MWh.
- 11) Chapter 5, pp. 109-117, 210, & 214-215: Regarding the results included in the draft NECP and in particular the ones of the electricity sector, we must first of all observe the zero change in electricity demand in 2030 compared to the current levels. Specifically, from the tables in pages 210 and 215 it can be concluded that the demand for electricity in 2030 in the interconnected system will be at the level of 58 TWh (excluding the consumption of the refinery's self-production), i.e. approximately the total demand for electricity in Greece in 2017 as depicted in ADMIE's Monthly Bulletins for the Interconnected System and the DEDDIE's Bulletins for Non-Interconnected Islands (MDN). It is therefore particularly striking that although the draft Plan foresees a total GDP growth of about 30% from 2016 to 2030 and an increase in final energy consumption by about 7% over the same period, the demand for electricity remains unchanged (while at the same time it is considered that in 2030 the penetration of electric passenger cars would amount to 10% of the total fleet). This forecast essentially points to Greece as a special case within the EU as the European Commission's long-term strategy foresees an increase in electricity production by

2050 (compared to today) by 35% -150% (depending on the scenario) while the annual report of the IEA (WEO 2108) states that electricity production in Europe in 2030 will be increased by about 5% -11% (depending on the scenario).

With regard to the results of the draft NECP for installed capacity per technology, the first observation is that it is given as a whole and does not mention the specific units that will operate. We believe that as the Plan concerns only the Greek Electricity System, it is feasible and desirable to depict the future capacity at unit level (and not just at technology level). In this case it would also be possible to assess the viability of the lignite units in 2030 that appear to have a total installed capacity of 2,700 MW. Considering that the new lignite unit Ptolemaida 5 (with increased production compared to the remaining lignite units) is included in this power, it is concluded that the other lignite units will operate in 2030 with less than 3,000 equivalent hours per year. With such limited operation for baseload units (which will de facto have reduced participation in the intraday and balancing markets) the viability of so many lignite units in 2030 is questionable. This issue is reinforced by taking into account that units with emissions of more than 550 kg CO<sub>2</sub>/MWh will probably be unlikely to participate in the available power markets in 2030 - according to the positions in the ongoing tripartite dialogue of the EU institutions on the new Electricity Market Regulation. For all these reasons, we consider it necessary for the final Plan to be accompanied by a missing-money-problem study, at least for the dispatchable units, so as to ascertain the prospect of financial viability of these units. The need for this economic analysis is further enhanced by the fact that the recent financial results of the three lignite units included in PPC's divestment program are significantly loss-making (at a time when the cost of EUA rights is well below 33.5 Euro/tn that the NECP assumes for 2030). Especially for lignite plants, the final Plan should take into account that these should in 2030 also comply with the new Best Available Techniques adopted by EU in 2017. Besides, the draft Plan itself notes on page 58 that the new limits introduced by recent Best Available Techniques "create major difficulties for existing plants to comply with reasonable costs and are an important additional limiting factor".

With regard to gas-fired units, the fact that for the next twelve years there is no change in their installed capacity is impressive, despite the very high need for flexible power -due to the high penetration of floating RES - and despite the fact that already at least one new investment in a natural gas unit has been announced. With regard to the production of gas-fired units and its significant reduction in 2030 compared to current levels, this is obviously the result of the extremely high gas prices assumed by the draft Plan. We believe that the final NECP (with the updating of assumptions introduced into energy models) will reflect a significantly different situation.

Regarding the penetration of RES by 2030 (about 8 GW in addition to their current power), the key issue that we expect the final Plan to clarify is not so much the magnitude of the additional capacity (this seems to be an automatic result since the European target was set at 32% for 2030) but how to make it possible to build and operate in the electricity system and the electricity market these new RES units. In particular, the question of spatial planning and the available land for new RES projects should be answered, as well as what new investments are needed (and when) both in the Transmission System and in the Distribution Network in order to allow for the integration of new RES projects. And because the installed capacity of RES in 2030 (and especially in the period after 2030, towards 2050) will be a multiple of the daily peak demand, it is clear that the available capacity for exports on the country's international electrical interconnections needs to be significantly increased and/or new interconnections, for both export of RES electricity and the better integration of the Greek electricity market into the single European energy market, need to be built.

With regard to energy storage, the draft Plan does not indicate which projects are to be commissioned by 2030. It should be clear in the final Plan, what percentage of storage capacity refers to pumping hydro units and what-if any- in other storage technologies (e.g. batteries, power to gas, etc ).

Finally, especially for the period 2025-2030, where the installed capacity of the RES units becomes decisive for the operation of the System, we consider it important to provide analytical data regarding the System's ability to manage stochastic RES generation at least at an hourly level. It is important that Energy Planning can guarantee that the particular capacity mix proposed, in conjunction with the available

storage capacity and the international interconnections, is able to fully and safely absorb the electricity produced from RES units. Otherwise, the competitiveness of RES and the ability to meet national targets are negatively affected.

- 12) Chapter 5, pp. 136-137 & Ch. 6 pp. 156: The draft Plan states that the results from the use of models show that in 2030 the electric vehicles will account for 10% of the fleet of passenger cars. In fact, nearly 60% of this penetration is achieved in the three-year period 2028-2030 and 30% in one year - in 2030. Of course, it is understood how much uncertainty is included in these results when 1/3 of the target of the twelve-year period depends on the last year of the period. This uncertainty is increased by taking into account (as stated in the sixth chapter where policies and measures are discussed) that the regulatory framework has not been completed, there is no financial support framework for electrification, nor is it scheduled the development of the necessary charging infrastructures. Especially at the last point, HAIPP's position is that the widespread deployment of the charging points and the fast times required to implement them (if we want to reach the 10% target for 2030) lead to choosing the competitive model for the development of charging points.
- 13) Chapter 6, p. 164. Regarding improving energy efficiency through market mechanisms, it is well known that energy efficiency obligation schemes for energy suppliers and distributors lead to additional costs, which add to an already high tax burden on energy products. As a general principle, we believe that energy should be freely circulated in open and competitive markets and available without additional burdens and distortions that may cause them. The main goal of open and competitive markets is the unimpeded generation, distribution and supply of energy to strengthen both the production sector and revitalize the living standards of the country's households. However, as energy saving is one of the main pillars of support for energy policy, HAIPP considers that participants in the distribution and supply of energy products - and in particular electricity companies - can contribute, as far as possible and in proportion to what is in place in the current period 2014-2020, to achieve part of the overall target. In this context, it is self-evident that the exclusion from the definition of the national target of volume sales of energy used in transport should be maintained for the next period, 2021-2030. We also believe that the assessment of the energy-saving actions of obligated parties should also be done within an energy efficiency market - analogous to the markets created for greenhouse gas emissions and guarantees of energy from renewable sources - in order to reduce the costs and optimize the benefit of these actions. In order to improve the enforcement of obligation schemes in the period 2021-2030, HAIPP proposes the possibility of exchanging Energy Saving Units, the free choice of behavioral and technical actions, the involvement of System and Network Operators in saving actions (with technical measures) and the formulation of a methodology for compliance costs which will be known in advance and will take account of the surplus or shortfall in the market for energy efficiency certificates to reflect market's actual conditions.
- 14) Chapter 5, p. 105: It is clear from Chart 28 that no significant reduction is expected for GHG emissions in sectors other than ETS (European Trading System, EU ETS) for the period up to 2030. However, because the observed emissions' reduction in the non-ETS sectors is mainly related to the decrease in energy consumption due to the economic crisis, the question arises whether the 30% GDP growth in the period 2016-2030 puts into question the current GHG emissions in non-ETS sectors and how (measures and planning of measures) such a development will be avoided.
- 15) Annexes, p. 209: Only the new planned electricity interconnection Greece-Bulgaria is mentioned in the assumptions table. The table does not include, for example, the interconnection with Cyprus, although on p. 174 of the draft Plans reference is made to it. We believe that the final NECP should be in line with the development plan of the System and its interconnections (as reflected in the ADMIE's Ten-Year Development Program and in ENTSOE's TYNDP) The NECP should also examine whether the 15% target

for interconnections is achieved and/or what measures are needed to achieve it.

Sincerely,

Giorgos Stamtsis  
General Manager

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