

TO:

**MRS.TEMENUZHKA PETKOVA
MINISTER OF ENERGY**

SUBJECT: POSITION ON STRATEGY FOR SUSTAINABLE ENERGY DEVELOPMENT UNTIL 2030 WITH A HORIZON UNTIL 2050 (THE STRATEGY)

Dear Mrs.Petkova,

Bulgarian Wind Energy Association (BGWEA) is a representative organization for the wind energy sector in the country. BGWEA unites the majority of the companies actively engaged in the sector, including investors in wind energy projects. The members of BGWEA represent a significant share of the total installed wind energy capacity in Bulgaria. The association actively works towards the development of legislative and regulatory framework in order to create a favorable business and investment environment. In the light of the new European energy legislation and the published Draft STRATEGY FOR SUSTAINABLE ENERGY DEVELOPMENT OF THE REPUBLIC OF BULGARIA UNTIL 2030 WITH A HORIZON UNTIL 2050 by the Ministry of Energy we would like to share our position from the wind energy producers` point of view.

In a period of significant transformations of the electricity sector, which require a change in government policies and business behavior of the companies, wind energy investors make their plans on the long-term signals for development of the sector and the presence of stable and predictable market environment. Competition to attracting reliable investors with sustainable business models that would contribute financially, socially and expertly to social and sectoral development is already available and it is expected to intensify in the coming years. In this sense, as

representatives of investors in the sector, we are addressing you with general comments and suggestions on the published Strategy.

1. 1000+ MW new installed wind capacity to 2030

The long-term strategy for the development of the electricity sector should take into account the role of wind energy in maintaining the stability and security of the electricity system, which is evident from the analysis and the subsequent graphs.

Our proposal is the forecast installed capacity from new wind projects to be reviewed and increased from 249 MW to 1149 MW. We have the following arguments:

- The development of new RES projects will not require state or electricity consumers' support; respectively the state should not limit how much energy from which source will be installed. This will be determined purely by market principles and accordingly the competitiveness of each technology. Although the Draft Strategy and National Energy and Climate Plan (NECP) fix these capacities as forecast, not limitations, they are the signal sought by investors for the ambitions at the national level. In addition, experience has shown that these capacities can be used by other institutions and misinterpreted as a 'threshold' or maximum allowable new capacity. It could stop the development of many new projects. A concrete example is the Environmental Assessment of the Strategy and NECP, which prohibits conducting new EIA procedures in a large part of the country.
- Wind and photovoltaic power plants are not interchangeable, but complementary RES sources, given the daily and annual production curve. The addition of more wind installations will increase the share of RES energy in the system without displacing the need for new photovoltaic plants and at the same time will help stabilize the RES load. The National Energy and Climate Plan of Romania, for example, provides for 30% of the new 7 GW to be from wind energy plants.
- A more balanced mix of wind and PV will also facilitate the management of the electricity system and reduce the need for daily production limitation at peak times in the middle of the day.

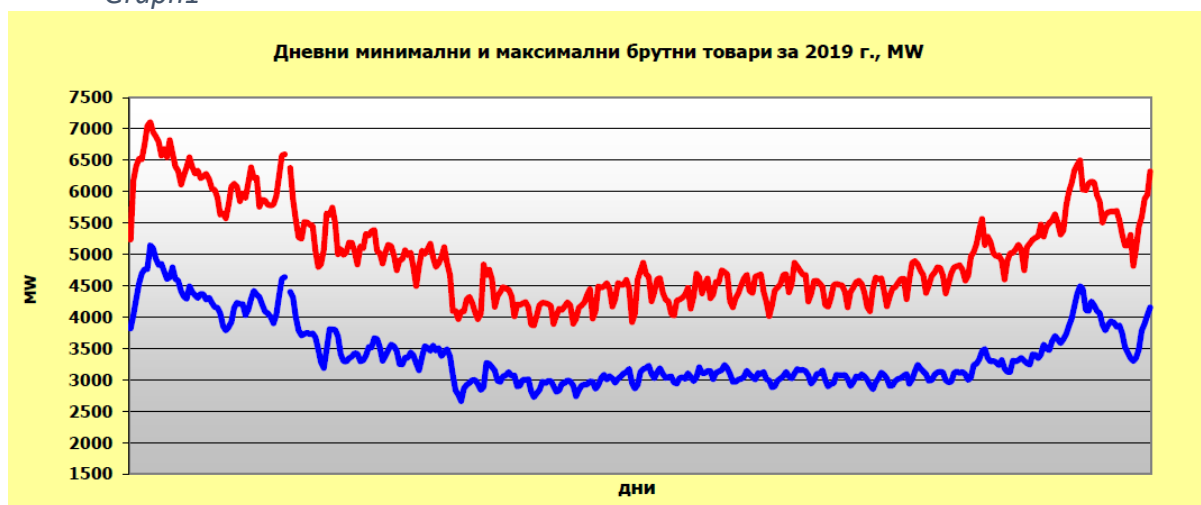
These proposals of ours refer to the following argumentation:

1.1. Energy system review

The energy loads of the Republic of Bulgaria vary between 2,500 MW and 7,000 MW, with peak levels during the winter heating period and the off-peak level during the summer period from

June to September. Below you could find the chart of minimum and maximum loads per day in 2019 (source: ESO EAD)

Graph1



Източник: Статистическа книжка 2019, ECO ЕАД - <http://www.eso.bg/?did=379>

The available capacities to cover these loads are:

Източник: Статистическа книжка 2019, ECO ЕАД - <http://www.eso.bg/?did=379>

ИНСТАЛИРАНИ МОЩНОСТИ 2019

Тип мощност	MW	Изменение 2019/2018, %	Дял, %
АЕЦ	2 000	0.0	15.7
ТЕЦ - лигнити	4 119	0.0	32.3
ТЕЦ - черни въглища	356	-1.7	2.8
ТЕЦ - газ	1 235	25.6	9.7
ВЕЦ	3 211	0.2	25.2
ВяЕЦ	701	0.0	5.5
ФЕЦ	1 059	1.2	8.3
ЕЦ на биомаса	77	0.4	0.6
Обща инст. мощност	12 758	2.1	100.0

Table 1

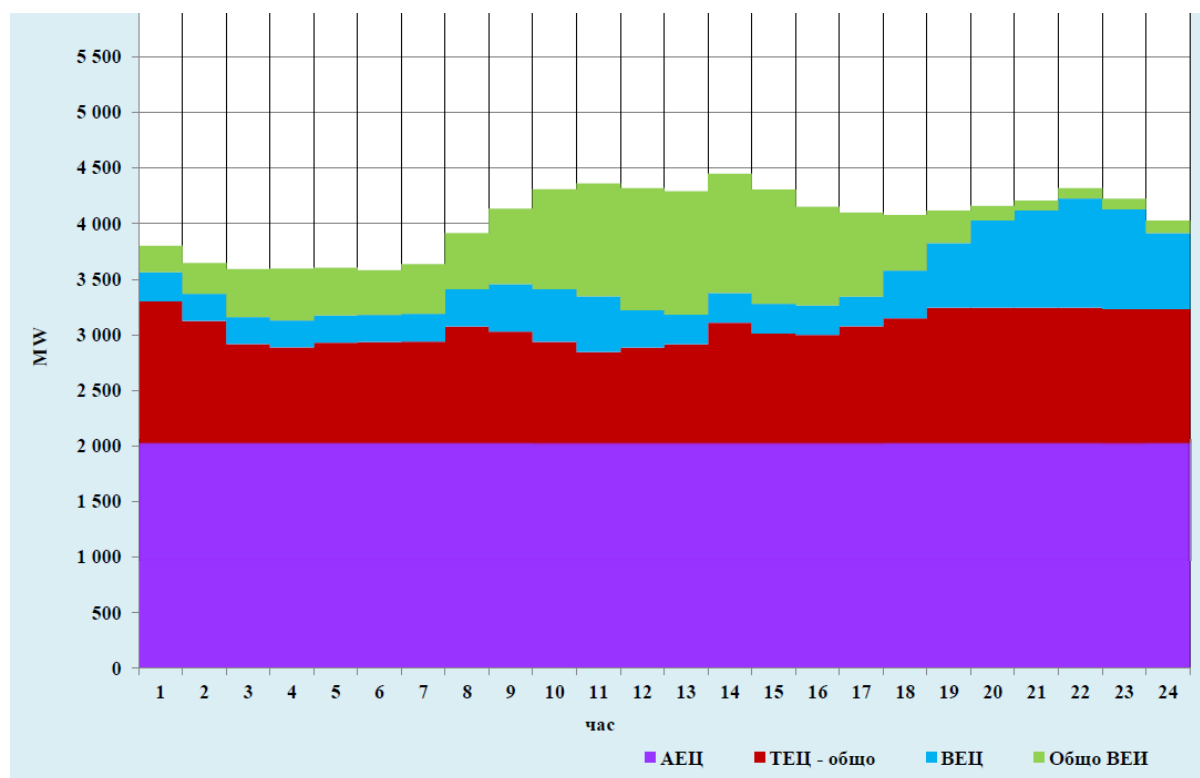
Източник: Статистическа книжка 2019, ECO ЕАД - <http://www.eso.bg/?did=379>

The installed capacities have different operating modes during the day.

Kozloduy NPP operates at full capacity almost all year round (95% load), except for maintenance activities of one of the two reactors. The effect of the NPP's inability to change capacity is that during the warm months of reduced loads, the NPP provides between 40% and 65% of the required load. Graph 2 shows what such a day would look like, in which the production of energy from renewable energy sources is at a high level.

Graph 1

Източник: Вътрешен анализ на база данни от ЕСО ЕАД



It can be seen from the graph that on such a day the hydrocarbon energy sources operate at a very low percentage of installed capacity, which strongly affects their long-term economic viability.

1.2. RES effects on the energy system

Comparing the data from graphs 3 and 4 (average monthly production values of RES) with the annual loads from graph 1, it could be seen that the acquisition of large photovoltaic capacities will lead to a strong dominance of this type of energy and at certain times can cause large energy surpluses. The addition of more than 1000 MW of solar capacity (above the already existing 1059 MW) will lead to serious structural difficulties during the sunny hours of the summer months and will have a significant impact on the financial results of other market participants.

Graph 2



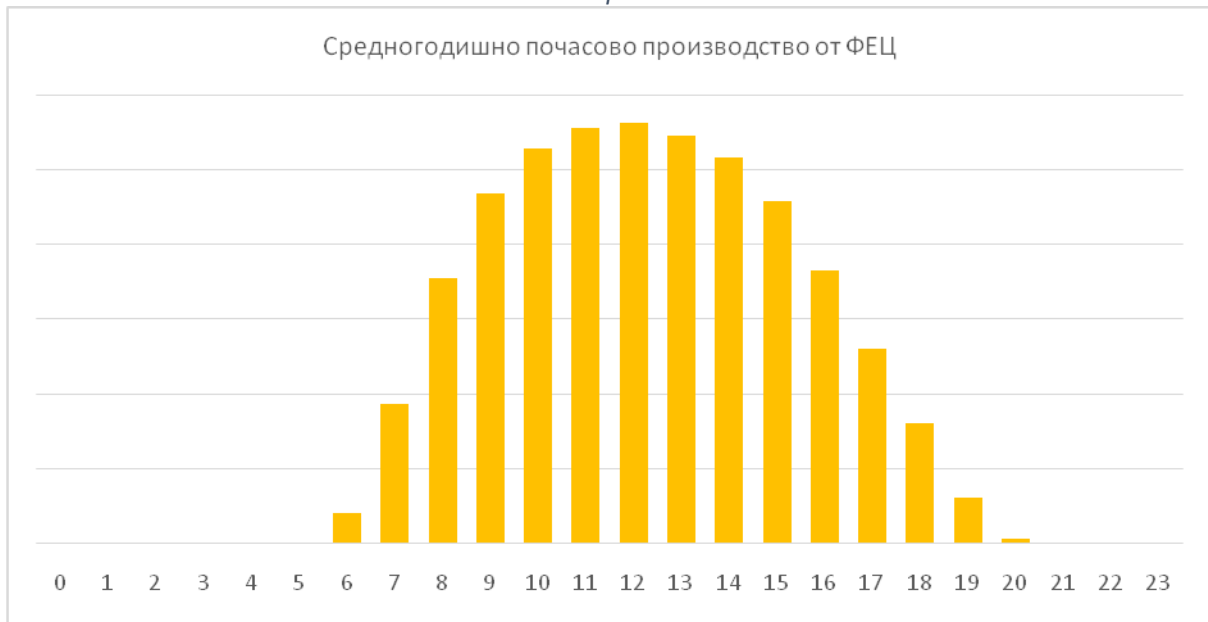
Източник: акумулирани данни от ЕСО ЕАД

Graph 3



Източник: акумулирани данни от ЕСО ЕАД

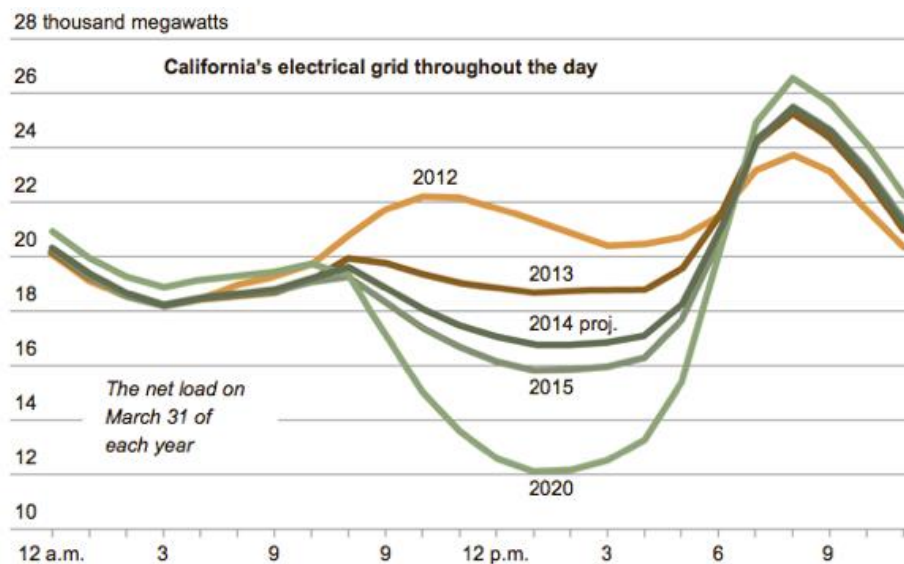
Graph4



Източник: акумулирани данни от ЕО ЕАД

This effect is already visible in some markets in different countries around the world, such as the California energy market, where the effects on the system can be clearly recognized when adding large amounts of solar energy.

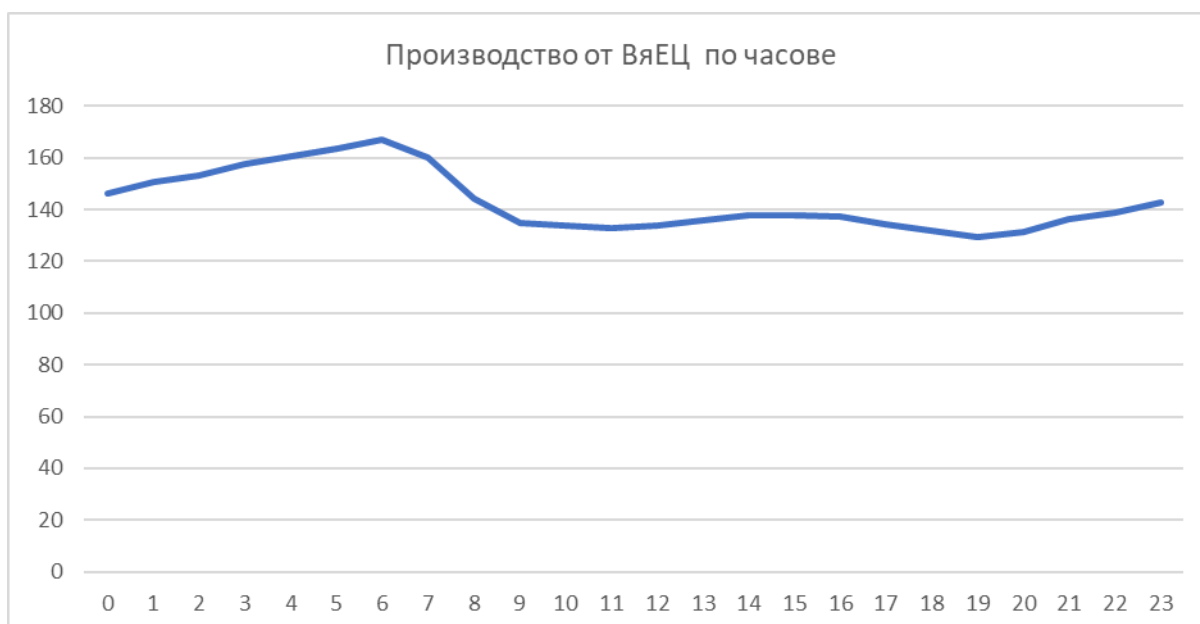
Graph 5



Source: CalISO

The same dependence is not valid for wind energy – there is a good correlation between average production and average consumption by months. In addition, wind farms do not have a clear peak of production on the average of the day (Graph 7).

Graph 6



Източник: акумулирани данни от ЕСО ЕАД

In conclusion, the addition of 1000 MW wind power would significantly increase the production of green energy during winter and evening hours and would contribute to a better balance of the energy system.

Wind energy is the cheapest and most affordable source of energy at European level. By costs reduction and development of the technologies, wind turbines are becoming more efficient and easy to market integration, and they are undoubtedly the main technology for achieving the decarbonisation goal. In the next 10 years, wind energy production could take an increasingly important role in Bulgaria's energy mix. In this regard, our proposal is that the Strategy should lay at least 1000 MW of new installed wind energy capacity to 2030.

2. RES market integration

The Strategy should outline the necessary concrete legislative and regulatory steps to make possible and competitive the entry and market integration of new RES. At the same time, an appropriate environment must be ensured to protect existing investments and ensure fair treatment.

3. Offshore wind energy

The European Commission estimates that the EU should install between 230 and 450 GW offshore wind farms to 2050 to meet the targets set in the European Green Deal. In the World Bank Report on the potential of offshore wind energy in the Black Sea (<https://energydata.info/dataset/offshore-wind-technical-potential#>) the wind capacity in the Bulgarian Black Sea is assessed to 26 GW (2 GW fixed and 24 GW floating). Given the growing importance of offshore wind energy on a European level and the declining global average prices of the technology, we believe that the Strategy should outline necessary regulatory and incentive measures for offshore wind projects.

4. Energy storage

Energy storage systems increase the efficiency of renewable energy use and cost optimization. Integrating large amounts of electricity from RES into the distribution network is a challenge that many European countries are already facing. Wind energy production is characterized by hourly fluctuations and intermittence, which makes this energy source difficult to forecast. The peak of energy produced does not coincide with the peak of consumption. These problems bring the issue of the energy system sustainability and the compensation of fluctuations in the generated and consumed capacities. A possible option for increasing the efficiency of network and the optimal use of wind resources is the development of electricity storage systems. The existence of a supportive legislative framework and predictable market conditions will increase the demand for energy storage solutions and will attract investments for the introduction of technologies. Moreover, energy storage systems are an undeniably flexible and reliable source of balancing energy.

We believe that the long-term development strategy of the sector should pay attention to energy storage systems and outline the steps for their development and application in the electricity system.

5. Introduction of a clear permit regime for renovation of RES power plants

We propose the Strategy should include a concept for renewal /upgrading of existing projects, the so-called "re-powering". After the 10th and especially after the 15th / 20th year of operation, existing RES plants can be retrofitted with new, more efficient panels and wind generators. This type of projects should be supported and facilitated because they use a large part of the already built infrastructure. Therefore, this concept should be enshrined in the Strategy, and subsequently the legal framework will be regulated as well as clear instructions for equal treatment of such projects.

6. Establishment of contact points to support investors

We recommend that the initiative "Investor Support Contact Points" during the construction of RES plants should be explained in detail, as there is uncertainty about its specific application - for which projects it will be applicable - for new or existing ones, how they will be specifically affected. projects, whether the change will require amendments to current legislation and the permitting regime.

We hope that the recommendations above mentioned would be taken into account in the final version of the Strategy. We remain available for constructive dialogue.

Yours sincerely,

Miglena Stoilova

Chairperson of BGWEA Supervisory Board