



dixigroup

ANALYTICS  
ON DUTY

## POSITION PAPER

### **Production of electricity from renewable sources: changes in the support scheme and financial challenges**

Ukraine must ensure compliance with international legal obligations in the energy sector. In particular, the **obligation to support the development of “green” energy and the transition to a low-carbon economy** arises from the provisions of relevant agreements (the EU-Ukraine Association Agreement, the Treaty establishing the Energy Community and the Paris Agreement). Directive 2009/28/EC on the promotion of the use of energy from renewable sources requires the development of RES support schemes based on transparency, non-discrimination, competition and cost-effectiveness. Thus, **support for RES should not be a tribute to vogue trends or a benefit for certain interest groups, but a priority of national energy policy.**

The situation that emerged in the electricity market in autumn 2019 was caused by a number of decisions of the previous government and parliament. These decisions created a feed-in tariff system, which the government was unable to support through existing mechanisms, and slowed down the implementation of a more competitive and efficient auction system.

As a result, **there are both technical and financial imbalances in the market.** A current system of RES support has led to distortions both in technology (rapid construction of solar facilities as opposed to bioenergy ones, which lack regulatory incentives) and in the system of balancing variable RES generation. Due to the ill-conceived system of compensation for the feed-in tariff, Guaranteed Buyer has a debt to RES producers of over 26.7 bn UAH (as of October 23, 2020)<sup>1</sup>. As a result, many operating companies are at risk of bankruptcy.

The **Memorandum of Understanding** concluded on June 10, 2020, between the Cabinet of Ministers of Ukraine and other public authorities, on the one hand, and investors/producers of electricity from RES, on the other hand, **became an important step to stabilize the situation.** These agreements, although not supported by all business representatives, are an alternative to disputes in international arbitration and the loss of investment attractiveness by Ukraine.

**The prompt implementation of key provisions of the memorandum through the adoption of the Law “On Amending Certain Laws of Ukraine to Improve the Conditions for Supporting the Production of Electricity from Alternative Energy Sources” should be mentioned.** Compliance of the most of its provisions with the memorandum is an opportunity to quickly implement the agreements and stabilize the situation in RES sector.

---

<sup>1</sup> DiXi Group calculations according to the Guaranteed Buyer:  
<https://www.gpee.com.ua/main/news?id=342>

The law provides for restructuring of the feed-in tariff for already built and new facilities by way of reduction (without extending the term of its application), accelerated schedule of increasing the responsibility of RES producers for imbalances, and a number of other solutions (see Annex 1).

The changes provide for the **introduction of a marginal (maximum) feed-in tariff** for all facilities put into operation before July 1, 2015, and all other facilities that will get a higher tariff after restructuring. This innovation **does not correspond to the voluntary character of restructuring**. The marginal tariff rates referred to in the law<sup>2</sup> did not contain the appropriate justification and calculations at the stage of consideration.

In contrast to the schedule of debt repayment proposed in the initial draft law and the memorandum, starting from 4Q2020 (40% of the debt) until the end of 2021, the law provides for a postponement for 2021-2022. In addition, compared to the original proposal, the law provides for a gradual reduction of the feed-in tariff (by 2.5%, 30% and 60%)<sup>3</sup> for solar facilities with 1+ MW capacity. This does not correspond to the text of the memorandum and, therefore, is a unilateral initiative of developers – apparently, to encourage solar developers to apply for future “green” auctions.

On the other hand, some market players, in particular, those of the solar energy market<sup>4</sup>, did not join the memorandum due to the **potential unprofitability of projects (at different stages of development) after the feed-in tariff restructuring**, especially in conditions of non-extending the term of support and retroactive changes. E.g., a change in support scheme for facilities with a capacity of less than 1 MW may lead to their default (in particular, for projects credited by Ukrainian banks at 15-20% interest) and negatively affect further decentralization of the power system and development of prosumers.

Another consequence of the legislative changes was the **vulnerability of some investors which took loans for the implementation of projects**. Even though the Ministry of Energy has agreed with state-owned banks and the National Bank of Ukraine on restructuring of the loans provided for RES projects<sup>5</sup>, such actions do not protect investors which have been provided with loans by commercial or foreign banks. In addition, the law clarifies government guarantees for the protection of foreign investment for the period of feed-in tariff (in terms of non-application of such guarantees to changes in tax legislation). According to the practice of international arbitration, changes in taxes and fees are usually not an argument in favour of investors in terms of protecting legitimate expectations and fair and equitable treatment; therefore, they are theoretically an indirect tool of influencing RES producers.

Thus, the **restructuring of feed-in tariff was not subjected to a scrupulous cost-benefit analysis**<sup>6</sup>, but was based rather on the current financial and political situation. In addition,

---

<sup>2</sup> At the level of feed-in tariff for ground-mounted solar facilities with an installed capacity of 10+ MW, which were put into operation by March 31, 2013, reduced by 15%.

<sup>3</sup> For facilities with a capacity of 1-75 MW: by 2.5% – until October 31, 2020; by 30% – until March 31, 2021; by 60% – from April 1, 2021; for facilities with a capacity of more than 75 MW: by 60% – from November 1, 2020.

<sup>4</sup> In particular, the position of the Ukrainian Association of Renewable Energy (UARE) was that the terms and conditions of the document took into account the interests of investors building large wind facilities and were discriminatory against electricity producers from solar.

<sup>5</sup> [http://mpe.kmu.gov.ua/minugol/control/uk/publish/article?art\\_id=245459010&cat\\_id=35109](http://mpe.kmu.gov.ua/minugol/control/uk/publish/article?art_id=245459010&cat_id=35109)

<sup>6</sup> According to market participants, the tax revenues lost from the reduction of feed-in tariff are equivalent to app. 250-300 million EUR per annum (i.e. 2.5-3 bn EUR by 2030, while possible savings for the government will be approximately 2 bn EUR). The likely reduction of investment in the sector due to the existing turbulence and, thus, additional fiscal revenues and job creation in related industries can also be added to the potential lost benefits.

economic assessment should go beyond energy alone and systematically assess the impact on the national economy and specific sectors, which was not the case too. According to DiXi Group experts, **the best basis for restructuring would be the calculation of a reasonable rate of return**, which takes into account both market situation, technology advancements and related reduction in the cost of projects as well as sector-specific and country risks. On the other hand, the level of adjustment should not exceed the legitimate expectations of investors, since borrowers should have the opportunity to restructure loans with Ukrainian banks.

The adoption of **amendments to support metallurgy** was also a surprise. The law introduces the concept of “green” electrometallurgy, which must meet certain requirements for CO<sub>2</sub> emissions per 1 ton of product (up to 250 kg) and use electric arc production technology. This technology is more environmentally friendly but capital-intensive<sup>7</sup>. For such enterprises, the transmission tariff will be reduced by the amount of costs TSO bears to implement public service obligations (to support RES producers).

According to the initiators of this provision, significant investments in more environmentally friendly production are already a paid contribution to the low carbon economy and, hence, to “green” energy. At the same time, **electrometallurgical enterprises are already relatively environmentally friendly and have even received state support through the execution of joint implementation projects under the Kyoto Protocol** (see Annex 2). In addition, the law does not provide for similar initiatives for the transition to environmentally efficient production methods for enterprises in other energy-intensive industries, which creates discriminatory conditions for them.

At the same time, **the adoption of these changes will not suffice for Guaranteed Buyer to reach financial stability** in order to ensure timely payment for “green” electricity. According to the developers of the law, it will only allow to reduce: 1) the forecasted deficit of Guaranteed Buyer by more than 6.4 bn UAH on annual basis; 2) the expenditures for settling imbalances caused by RES producers by over 1 bn UAH per annum; 3) the total amount of payments under the feed-in tariff by more than 2 bn EUR until December 31, 2029.<sup>8</sup>

It is obvious that the **resumption of Guaranteed Buyer’s solvency and fast repayment of debt are crucial for RES investors**, and for this purpose the government has declared its intention to raise loans and use other financial instruments.

**It is worth noting the following decisions** that have already been made to settle the deficit of Guaranteed Buyer:

- using part of TSO revenues (70%) from the sale of cross-border capacity<sup>9</sup>, which is directly prescribed by the law, and only half of these funds are used for the payment to RES producers (the other half – to Energoatom);
- revision by the government of the PSO mechanism (to support households) in terms of the electricity selling price by Energoatom and Ukrhydroenergo for Guaranteed Buyer (10 UAH/MWh)<sup>10</sup>;

---

<sup>7</sup> Only 7% of steel production in Ukraine is manufactured using electric arc production, while in the EU it is 50%.

<sup>8</sup> <http://w1.c1.rada.gov.ua/pls/zweb2/webproc34?id=&pf3511=69138&pf35401=529670>

<sup>9</sup> <https://zakon.rada.gov.ua/laws/show/810-IX#Text>

<sup>10</sup> <https://www.gpee.com.ua/main/news?id=398>, <https://www.kmu.gov.ua/news/uryad-udoskonaliiv-mehanism-psy-energoatom-ta-ukrgidroenergo-otrimali-zmogu-prodavati-bilshe-elektroenergiyi-za-vigidnimi-umovami>

- granting Guaranteed Buyer the right to sell electricity of RES producers on the bilateral contracts market<sup>11</sup> (the first auction took place on October 5<sup>12</sup>).

**Other non-tariff financial support mechanisms that have not yet been approved or sanctioned** include:

- attracting loans from international financial institutions<sup>13</sup> by Ukrenergo through the granted sovereign guarantees<sup>14</sup> – a relevant draft law<sup>15</sup>, which paved the way for the provision of guarantees for international loans to TSO and/or state-owned generating companies, failed during the voting;

- budget expenditures directly provided by the law at the level of min. 20% of the cost of produced “green” electricity, which is forecasted by Guaranteed Buyer at 60 bn UAH in 2021<sup>16</sup> – these expenditures were not included in the draft 2021 State Budget<sup>17</sup>; the Ministry of Energy plans the allocation of 11.55 bn UAH for these needs<sup>18</sup>;

- issuance of 5-year domestic government loan bonds, as referred to in the law (as the task for the Cabinet of Ministers of Ukraine to develop the relevant draft law), – MPs introduced a legislative initiative<sup>19</sup> that provides for granting the right to the Ministry of Finance to issue domestic bonds for 8.96 bn UAH (40% of the Guaranteed Buyer debt according to the memorandum) and 10.64 bn UAH (as a source of funding budget expenditures for the payment of current liabilities for August-December 2020), and proposes to make appropriate amendments to the 2020 State Budget.

At the same time, attracting such additional sources of revenue will have its price for Ukrainians. After all, **these are also debts that will have to be paid later, or financial resources that were intended for other items of budget expenditures.** RES financing goes beyond the perimeter of the redistribution of funds in the electricity market (revenues from the electricity transmission tariff) and is partially transferred to all taxpayers (instead of electricity consumers only).

However, **the law does not provide for the “compensators” of these budget expenditures**, i.e. the sources of additional revenues or items from which expenditures will be redistributed. For example, the carbon tax, which now entirely goes into the general fund of state budget, could be the source of revenues. However, revenues from the CO<sub>2</sub> emissions tax amount to app. 1 bn UAH per annum, and even if its rates are increased 2-3 times and used entirely on RES payments and debt repayment, this will not be sufficient<sup>20</sup>. It is unclear where the additional

---

<sup>11</sup> [http://mpe.kmu.gov.ua/minugol/control/publish/article?art\\_id=245475066](http://mpe.kmu.gov.ua/minugol/control/publish/article?art_id=245475066)

<sup>12</sup> <https://www.gpee.com.ua/main/news?id=445>

<sup>13</sup> According to Ukrenergo, it is about 128 million EUR (3.8 bn UAH) from the EBRD and 92 million EUR (2.8 bn UAH) from the EIB; according to the estimates of the Ministry of Energy, the amount of required lending is up to 10 bn UAH.

<sup>14</sup> [http://mpe.kmu.gov.ua/minugol/control/uk/publish/article;jsessionid=71A6035C1894E001AF7F8DEBCA044AB8.app1?art\\_id=245475520&cat\\_id=35109](http://mpe.kmu.gov.ua/minugol/control/uk/publish/article;jsessionid=71A6035C1894E001AF7F8DEBCA044AB8.app1?art_id=245475520&cat_id=35109)

<sup>15</sup> [http://w1.c1.rada.gov.ua/pls/zweb2/webproc4\\_1?pf3511=69645](http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=69645)

<sup>16</sup> [https://www.gpee.com.ua/files/%D0%9F%D0%B5%D1%82%D1%80%D0%B8%D0%BA%D0%BE%D0%B2%D0%B5%D1%86%D1%8C\\_%D0%93%D0%9F\\_2020\\_09\\_17.pdf](https://www.gpee.com.ua/files/%D0%9F%D0%B5%D1%82%D1%80%D0%B8%D0%BA%D0%BE%D0%B2%D0%B5%D1%86%D1%8C_%D0%93%D0%9F_2020_09_17.pdf)

<sup>17</sup> [http://w1.c1.rada.gov.ua/pls/zweb2/webproc4\\_1?pf3511=69938](http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=69938)

<sup>18</sup> [http://mpe.kmu.gov.ua/minugol/control/uk/publish/article;jsessionid=71A6035C1894E001AF7F8DEBCA044AB8.app1?art\\_id=245475118&cat\\_id=35109](http://mpe.kmu.gov.ua/minugol/control/uk/publish/article;jsessionid=71A6035C1894E001AF7F8DEBCA044AB8.app1?art_id=245475118&cat_id=35109)

<sup>19</sup> [http://w1.c1.rada.gov.ua/pls/zweb2/webproc4\\_1?pf3511=70054](http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=70054)

<sup>20</sup> According to DiXi Group experts, to cover 20% of settlements to RES producers from the state budget at the current level of carbon emissions, it is necessary to increase such a tax at least 11 times (112 UAH/t at the current taxable amount; 201 UAH/t – provided the taxation of only emissions from energy sector).

financial resources will come from, so it is likely that the government will accumulate new debts to producers.

Given the above, DiXi Group experts see the following **steps as the most effective means of restoring the financial balance** of RES support scheme:

### **1) Review sources of financing the Guaranteed Buyer services – first of all, settlement of Ukrenergo debt**

The law “On Electricity Market” stipulates that public service obligations for increasing the share of energy production from alternative sources rest with Guaranteed Buyer, universal service providers (USPs) and the transmission system operator (TSO). Despite the fact that revenues of Guaranteed Buyer are among the sources of “green” energy financing, the transmission tariff is currently the main source of covering these obligations.

It should be noted that the latest tariff revision process is not a desire of the TSO but a **consequence of the deficits accumulated in the electricity market and the shortcomings of the existing PSO mechanism**. According to the National Energy and Utilities Regulatory Commission (NEURC) decision, from August 1, 2020, the transmission tariff of Ukrenergo has increased 1.5 times to 240.2 UAH/MWh<sup>21</sup>. This provided additional sources of revenues for the payments by Guaranteed Buyer but did not solve the problem of Ukrenergo funds deficit for the PSO implementation.

In summer 2020, the TSO proposed to increase the tariff up to 596.5 UAH/MWh, and subsequently - up to 327.9 UAH/MWh; new calculations in September 2020 indicated the need to increase the tariff up to 640.48 UAH/MWh in November-December 2020 and up to 501.03 UAH/MWh from 2021 on<sup>22</sup>; while in November, following an open discussion, the NEURC approved to increase the tariff from December 1, 2020, up to 312.76 UAH/MWh<sup>23</sup>.

When revising the tariff for electricity transmission, **it is important to find a balance between the need to support RES development and the interests of industrial and other non-household consumers** because an increase in tariff burden will affect not only their competitiveness (including foreign markets) but also the cost of utilities for households and all other goods and services produced in the country. Ukrenergo’s tariff should be economically justified, in particular taking into account its multiplier effect. This will allow predictable and impartial (co)financing of RES subsidization.

Other ways of settling Ukrenergo payments to Guaranteed Buyer (using part of revenues from allocating the cross-border capacity, attracting loans under sovereign guarantees) **are not sustainable, since they negatively affect the financial condition of the TSO**, deprive of the resources for modernization of transmission system facilities, strengthening of operational safety and strategic development. It is not reasonable to consider the proposed solutions that affect the public finance system, including direct budget expenditures and debt instruments (domestic government loan bonds), as a permanent source of funds.

In the future, the best way to solve the problem will be **to exclude the component of RES support from the transmission tariff and monetize such support through a special**

---

<sup>21</sup> <http://www.nerc.gov.ua/?id=53029>

<sup>22</sup> [https://ua.energy/wp-content/uploads/2020/09/2020\\_Informatsijne\\_povidomlennya\\_peredacha\\_15.09.20.v.2.pdf](https://ua.energy/wp-content/uploads/2020/09/2020_Informatsijne_povidomlennya_peredacha_15.09.20.v.2.pdf)

<sup>23</sup> <http://www.nerc.gov.ua/?id=54816>, <http://www.nerc.gov.ua/?news=10716>

**markup (charge) on the price of electricity.** This approach will allow to jointly distribute the financial burden associated with the “green” energy transition to all consumers.

In the long run, it would be appropriate to introduce a mechanism that would provide for the opportunity of guaranteed receipt of energy from renewable sources. These may be certain certificates of origin with obligations for suppliers. This mechanism is successful in the United States (Renewable Energy Certificates), the EU (Guarantees of Origin) and other countries. For sure, such a tool will be in demand at the stages of greater market maturity, when the cost of “green” energy decreases.

The Law No. 810-IX already provides for the development of a draft law on granting RES producers the right to withdraw from the balancing group of Guaranteed Buyer and independently sell electricity on the market (with compensation for the difference between the feed-in tariff or the auction price and the market price). The **mechanism of contracts for differences** will allow to reduce the dependence on the finances of Guaranteed Buyer<sup>24</sup> and **can be an intermediate stage until the full participation of all RES producers in the market.** Another mechanism that can be introduced right now is bilateral agreements with buyers (corporate PPAs), which are ready to purchase “green” electricity at a price above the market one.

## 2) Bringing regulated prices for households to market level

The approach to pricing for household consumers should reflect the full economic cost of production, transportation and supply of electricity (cost-reflective pricing), including further waiver of cross-subsidization. Currently, **electricity prices are the same for all categories of households and have not changed since March 1, 2017.** It means that the current model of public service obligations provides for the protection of not only vulnerable but also wealthy consumers, which seems economically unjustified. In addition, for a long time, Ukraine has dual social safety measures, in particular regulated electricity prices and targeted assistance (housing subsidies).

According to European best practices, **it is reasonable to gradually bring prices for households to the market level and support vulnerable consumers through direct monetized subsidies** to pay for energy and other utilities. The first step towards such deregulation may be the cancellation of the preferential block tariff for the first 100 kWh of monthly consumption with the simultaneous determination of the criteria of vulnerable households that need subsidies<sup>25</sup>; the second step – to adopt a program to gradually bring prices to the market level.

According to preliminary estimates of DiXi Group as of summer 2020, with a one-time cancellation of the current PSO mechanism and bringing prices for households to the market level, the average price for households in the IPS trade zone would be about 2.4 UAH/kWh, and in the BEI zone – 2.66 UAH/kWh<sup>26</sup>. At the same time, the price could vary from 2.02 UAH/kWh (Kyiv) to 3.04 UAH/kWh (Luhansk region) for different regions.

This approach will contribute to the gradual normalization of the market, ensure correct price signals for investors and consumers and more reasonable economic conduct of all market

---

<sup>24</sup> <https://www.epravda.com.ua/columns/2020/08/20/664222/>

<sup>25</sup> The USAID Energy Security Project estimates show that the number of such households is 3.6 million

<sup>26</sup> Assessment of market prices for households may change given the dynamics of purchase prices in wholesale market segments as well as in the case of changes in other fixed components of the retail price (transmission, distribution and supply tariffs).

participants. Finally, it will allow to increase competition in the wholesale and retail market segments, introduce the possibility to choose and switch supplier by household consumers which, in turn, may at least contain the increase of retail electricity prices.

### 3) Transition from commodity-based to the financial model of PSO (f-PSO)

The changes will consist in the transition from the physical transmission of electricity between market participants, subject to PSO imposed (when the defined volume of electricity is sold by state-owned producers at fixed prices below market level), to direct financial settlements (when state-owned producers will sell electricity at market prices and compensate suppliers for the difference between the market price and the fixed one for households)<sup>27</sup>. This will allow **not only the free sale of all electricity produced by Energoatom and Ukrhydroenergo in all market segments but also a more efficient receipt of funds by Guaranteed Buyer.**

The design of the financial PSO model agreed with the Energy Community Secretariat should be reviewed by the Ministry of Energy and submitted for discussion as soon as possible<sup>28</sup>. The transition to the financial PSO model should take place under several criteria, including effective monitoring of the bilateral contracts market, amendments to the Market Rules on deconcentration (volumes/lots put up for sale), careful monitoring of the activities of universal service providers (USPs) and unconditional fulfillment of contracts.

The change in RES support scheme as defined by law may slow down (if not stop) the development of the sector for a certain period. Therefore, the policy to support “green” energy should take into account other important issues:

#### 1) Improving the design of auctions for the distribution of support quotas

Recent amendments to the Law “On Alternative Energy Sources” provide for a number of changes in the organization and conduct of auctions. In particular, the establishment of annual support quotas in certain regions and the reduction of the minimum share of their mandatory distribution by technology (up to 10%) **makes it possible to support projects with minimal impact on the performance of the power system, increase its flexibility** through RES (e.g. balancing through biogas/biomass facilities) and using quotas in areas with a deficit of generating capacity (and/or limit quotas for areas with a surplus).

Setting a limit on the maximum capacity of the facility at the relevant auction and permission to participate to rooftop or façade-mounted solar facilities will contribute to the **decentralization of the power system and reduce losses in electricity transmission as well as support the development of small and medium-sized enterprises in the sector.**

On the other hand, excluding the criterion of a minimum number of auctions per annum or their calendar deadlines may theoretically allow the government not to plan them at all. The postponement of the first auction and announcement of support quotas is possible due to low economic activity during the COVID-19 pandemic as well as investor concerns due to the recent change in the rules, which has not yet stabilized the settlements. Taken together, this may lead

---

<sup>27</sup> <https://www.facebook.com/usaidesp/posts/1350203955173405>

<sup>28</sup> <https://www.kmu.gov.ua/news/olga-buslavec-obgovorila-z-sekretariatom-energetichnogo-spivtovaristva-pitannya-stabilizaciyi-situaciyi-v-energetici>, <http://reform.energy/news/nkreku-otstaivaet-finansovuyu-model-pso-na-rynke-elektroenergii-soglasovannuyu-s-sekretariatom-energosoobshchestva-15151>

to low interest in participating in the auctions and, as a consequence, weak competition and therefore a potential loss for the final consumer. It also extends the period of uncertainty for the entire RES sector, since the auctions were to be conducted much earlier – as required by current law, starting from December 2019.

Setting bid caps<sup>29</sup> may have both positive and negative consequences. However, the key issue is the **criteria for bid caps. In our opinion, they should be transparent and take into account an economically reasonable rate of return for a relevant technology.** In this context, important factors are risks (including regulatory ones)<sup>30</sup> and the cost of debt financing. Restrictions for technologies other than solar and wind may have a negative impact on the development of bioenergy, which trails far behind the targets of the National Renewable Energy Action Plan by 2020 (only 17% of the planned capacity is commissioned as of January 1, 2020).

## **2) Launch of a compensation mechanism for RES producers in case of curtailment**

The NEURC approved draft amendments to the Market Rules on Compensation for Unsold Electricity for Producers Selling at Feed-In Tariff or Auction Price as well as the methodology for calculating the amount of such curtailment<sup>31</sup>. The Regulator proposes that the compensation be made by the TSO through the balancing market mechanism (except for the cases of dispatching commands in the event of systemic restrictions, which are a consequence of force majeure circumstances). Meanwhile, Ukrenergo is introducing a curtailment management system for RES generation, which simplifies information exchange and allows managing electricity surplus<sup>32</sup>. **Timely implementation of such a mechanism will allow to avoid unexpected loss of revenues in the business plans of RES investors.**

## **3) Measures for technical integration of RES into the power system of Ukraine**

A range of possible solutions includes tenders for the construction of flexible generating capacity and the implementation of demand management activities, the development of storage systems and smart grids as well as the improvement of technology for weather forecasting and forecasting RES electricity production. Another potential tool is redispatching, not only for the RES sector but for all types of generation. Not the least role is played by the planning of RES development, location and connection of facilities in the context of better planning of the electricity transmission and distribution networks development.

The use of such methods will all to **strengthen the operational safety of the Integrated Power System of Ukraine** and not to stop (limit) the issuance of technical conditions for the connection of RES installations. It is also important to introduce producer responsibility for imbalances in a timely manner. The relevant regulation should be introduced from the beginning of 2021 without delay.

---

<sup>29</sup> For solar and wind facilities – at the level of 9 eurocents/kWh (until December 31, 2024) and 8 eurocents/kWh (effective January 1, 2025); for other technologies – 12 eurocents/kWh.

<sup>30</sup> E.g., due to increased regulatory requirements in May 2019 in Germany, only 45% of the quotas were allocated at auctions.

<sup>31</sup> <http://www.nerc.gov.ua/?id=51838>

<sup>32</sup> <https://ua.energy/renewables/ukrenergo-testuye-systemu-keruvannya-obmezhenyamy-vde/>



#### **4) Cancellation of subsidies for fossil energy sources, introduction of an effective tax on CO<sub>2</sub> emissions**

The gradual elimination of subsidies and the introduction of a rather high tax on emissions in the cost price of electricity from coal-fired (and other working on fossil energy sources) TPPs are most likely to have a **positive impact on the business case of RES projects in investment decision-making and create the possibility of selling electricity from RES without subsidization**. These steps would make it possible to accumulate part of the money (for example, through trust funds) and develop appropriate mechanisms to support RES, including small distributed generation.

The introduction of such a mechanism is also important in view of the European Green Deal strategy implementation. In particular, this document provides for the introduction of a carbon border adjustment mechanism<sup>33</sup>, which may significantly complicate the export of electricity and energy-intensive goods from Ukraine to the EU, as well as have an impact on the competitiveness of export-oriented sectors of the Ukrainian economy<sup>34</sup>.

---

<sup>33</sup> Public consultations in the EU on the carbon border adjustment mechanism began in July 2020, with further implementation of relevant legislative initiatives in the second quarter of 2021.

<sup>34</sup> As of 2019, the energy intensity of GDP of industrial products in Ukraine is more than four times higher than the similar average indicator in the EU.

## **Annex 1. Overview of amendments to the legislation on improving the conditions for supporting electricity production from RES**

While being considered, the draft law No. 3658 received 1,281 amendments from MPs, with 30 included (also partially) and the rest rejected. Regarding the draft law adopted in the first reading, the adopted Law No. 810-IX includes certain different provisions and supplements:

- The concept of “green” electrometallurgy enterprise, qualification criteria and the validity period of the provision (amendments by MP Kysylevskyi) were introduced.
- Expenditures of the state budget for financial support to Guaranteed Buyer to pay for electricity produced from alternative sources in accordance with the budget requests of the Ministry of Energy and on the basis of the bills provided by the NEURC in the amount of at least 20% of electricity production from RES according to the forecasted electricity balance in the corresponding year (amendments by MP Gerus). Thus, RES funding goes beyond the perimeter of the redistribution of funds in the electricity market (from revenues from the electricity transmission tariff and revenues of Guaranteed Buyer) and is partially transferred to taxpayers.
- Amendments were made to the guarantee of foreign investment for the validity period of the feed-in tariff on the non-extension of such guarantees to changes in tax legislation.
  - According to the practice of international arbitration, changes in taxes and fees are usually not an argument in favour of investors in terms of protection of legitimate expectations and fair and equitable treatment. This amendment can be attributed not only to potential fiscal changes but also to the excise duty on electricity from RES already proposed by the NEURC, which was noted by the Regulator’s representatives at the meetings on revision of the electricity transmission tariff in June-July 2020.
- The possible maximum amount of the surcharge to the feed-in tariff was increased up to 20%, provided that Ukrainian equipment is used with a share of 70% or more in the first 6 years of operation of a RES facility (after that, a surplus of up to 10%).
- The current norm on limiting the share of the final beneficiary, which has the right to receive no more than 25% of the annual support quota for a corresponding year, was preserved (35% was proposed in the first reading).
- The duration of pre-PPA on the feed-in tariff for bioenergy facilities was prolonged until January 1, 2023.
- Increasing the maximum capacity of household RES facilities from 30 kW to 50 kW, on which there is the obligation to purchase electricity at the feed-in tariff (net production, after deducting own consumption), as well as the priority of such payments is indicated in each settlement period.
- 70% of the funds received by the transmission system operator (Ukrenergo) from the allocation of cross-border capacity as of July 1, 2020, are used to repay the debt to Guaranteed Buyer for the services provided to ensure an increase in the share of electricity production from alternative sources. Guaranteed Buyer is obliged to transfer 50% of these funds to Energoatom, another 50% – to RES producers.
- It is proposed to develop a draft law on debt repayment (as of August 1, 2020) to RES producers in 2021-2022 by issuing domestic government loan bonds with a maturity of 5 years.
- Rates of the feed-in tariff, responsibility for imbalances and terms of repaying the debt of Guaranteed Buyer are envisaged (see the table below).

Type of energy	Capacity	Commissioning period	Proposed amount of reduction according to the memorandum between the investors and the Cabinet of Ministers (and related government agencies) <sup>35</sup>	text of the draft Law No. 3658	text of the Law of Ukraine No. 810-IX
<b>1. Reduction of the feed-in tariff</b>					
1.1. commissioned from 1 January 2020					
Solar	≥ 1 MW	1 January 2020 to 31 July 2020	RES producers accept the conditions of limiting the terms of commissioning new solar facilities at the feed-in tariff until 31 July 2020	2.5%	–
		from 1 August 2020		60%	
	≥1<75 MW	1 January 2020 to 31 October 2020		–	2.5%
		1 November 2020 to 31 March 2021			30%
	≥75 MW	from 1 April 2021		60%	
		from 1 November 2020		60%	
	<1 MW	from 1 January 2020		2.5%	
not specified	from 1 January 2020	2.5%	–		
Wind	not specified	from 1 January 2020	2.5%		
1.2. commissioned before 31 December 2019					
Solar	≥ 1 MW	1 July 2015 to 31 December 2019	15%		
Solar	<1 MW	1 July 2015 to 31 December 2019	10%	7.5%	
Wind	≥ 2 MW (individually installed)	1 July 2015 to 31 December 2019	7.5%		

<sup>35</sup> The Memorandum does not apply to electricity consumers, including energy cooperatives and private households, whose generating units produce electrical energy from alternative energy sources and for which a “green” tariff has been set as of the date of signing the Memorandum

all types	not specified	before 30 June 2015	a marginal (maximum) feed-in tariff at the level of the tariff set for ground-mounted solar facilities with an installed capacity exceeding 10 MW and put into operation before 31 March 2013 inclusive, reduced by 15 percent. If the feed-in tariffs for facilities, taking into account the above-mentioned restructuring conditions, exceed the marginal feed-in tariff, the feed-in tariffs for such facilities are reduced to the level of the marginal feed-in tariff.	a marginal (maximum) feed-in tariff that equals the feed-in tariff set for ground-mounted solar facilities with an installed capacity exceeding 10 MW, which were put into operation before 31 March 2013 inclusive, multiplied by a reduction factor of 0.85.	a marginal (maximum) feed-in tariff is equal to the feed-in tariff set for ground-mounted solar facilities with an installed capacity of more than 10 MW, which were put into operation before 31 March 2013 inclusive, multiplied by a reduction factor 0.95.
<b>2. Responsibility for imbalances</b>					
Memorandum		text of the draft Law No. 3658		text of the Law of Ukraine No. 810-IX	
Responsibility of RES producers for imbalances: 50% – from 1 January 2021; 100% – from 1 January 2022		1) for RES producers with capacity over 1 MW: before 31 December 2020 – 0%; from 1 January 2021 – 50%; from 1 January 2022 – 100%; 2) for RES producers with capacity 1 MW or below: before 31 December 2020 – 0%; from: 1 January 2021 – 10%; 1 January 2022 – 20%; 1 January 2023 – 30%; 1 January 2024 – 40%; 1 January 2025 – 50%; 1 January 2026 – 60%; 1 January 2027 – 70%; 1 January 2028 – 80%; 1 January 2029 – 90%; 1 January 2030 – 100%			
The amount of the permissible possible error in forecasting (tolerance margin) for wind is 10%; for solar – 5%					
<b>3. Terms of repayment of Guaranteed Buyer debt to RES producers</b>					
Memorandum		text of the draft Law No. 3658		text of the Law of Ukraine No. 810-IX	
40% in 4Q2020, 15% each quarter in 2021		in 2021-2022 by issuance of domestic government loan bonds			

## Annex 2. Joint implementation projects in the metallurgical industry under the Kyoto Protocol

Company	Joint project	Funds raised, thousand USD	Emissions reduction in 2008-2012, equivalent to 1 ton of CO <sub>2</sub>	Project data sheet
<b>Electric arc steel production</b>				
Elektrostal	Implementation of Arc Furnace Steelmaking	N/A	1570285	<a href="https://ji.unfccc.int/JIITLProject/DB/4THB9WT0PK6F721UQA5H6PTHZEXT4C/details">https://ji.unfccc.int/JIITLProject/DB/4THB9WT0PK6F721UQA5H6PTHZEXT4C/details</a>
Energomashspetsstal <sup>36</sup>	Improvement of the Energy Efficiency	40.2		<a href="http://ji.unfccc.int/JIITLProject/DB/YOUSNWZU9QFKA K57O4JCZ5391FTGK5/details">http://ji.unfccc.int/JIITLProject/DB/YOUSNWZU9QFKA K57O4JCZ5391FTGK5/details</a>
<b>Blast furnace steel production</b>				
Dniprovsky Integrated Iron and Steel Works	Revamping of Sintering and Blast-Furnace Production	20	3526662	<a href="http://www.carbonunitsregistry.gov.ua/en/publication/281">http://www.carbonunitsregistry.gov.ua/en/publication/281</a>
Dniprovsky Integrated Iron and Steel Works	Installation of two billet continuous casting machines and two ladle furnaces	20	1770205	<a href="http://www.carbonunitsregistry.gov.ua/en/publication/277">http://www.carbonunitsregistry.gov.ua/en/publication/277</a>
Azovstal	Introduction of Energy Efficiency Measures	N/A	4123407	<a href="https://ji.unfccc.int/JIITLProject/DB/SH8R5WAZQ92CWBIXEZIPMSGCVXT2KS/details">https://ji.unfccc.int/JIITLProject/DB/SH8R5WAZQ92CWBIXEZIPMSGCVXT2KS/details</a>
Enakievo Metallurgical Works	Introduction of Energy Efficiency Measures	N/A	1749295	<a href="http://ji.unfccc.int/JIITLProject/DB/FX1G65CCXNL6DMJKCKODRF3QL2Z3EF/details">http://ji.unfccc.int/JIITLProject/DB/FX1G65CCXNL6DMJKCKODRF3QL2Z3EF/details</a>
Donetsksteel-Metallurgical Plant <sup>37</sup>	N/A	N/A		<a href="https://ji.unfccc.int/JIITLProject/DB/CCTIDAF9UUF942RRWVV5D0NCO5GJOI/details">https://ji.unfccc.int/JIITLProject/DB/CCTIDAF9UUF942RRWVV5D0NCO5GJOI/details</a>
ArcelorMittal Kryvyi Rih	Energy Efficiency Investment Program	20	354626	<a href="https://ji.unfccc.int/JIITLProject/DB/JQ756K3VCDKV3E8T8G4GGFNP4C4IDC/details">https://ji.unfccc.int/JIITLProject/DB/JQ756K3VCDKV3E8T8G4GGFNP4C4IDC/details</a>
Alchevsk Steel Mill	Revamping and Modernization	N/A	3893882	<a href="http://ji.unfccc.int/JIITLProject/DB/V75OZ8TQOFTB325LEDME2628ZD548/details">http://ji.unfccc.int/JIITLProject/DB/V75OZ8TQOFTB325LEDME2628ZD548/details</a>
Alchevsk Steel Mill	Revamping and Modernization	20	3377745	<a href="http://ji.unfccc.int/JIITLProject/DB/SH71YMI81FDOBHK65V7RHU1AOSQCX1/details">http://ji.unfccc.int/JIITLProject/DB/SH71YMI81FDOBHK65V7RHU1AOSQCX1/details</a>
Alchevsk Steel Mill	Installation of a New Waste Heat Recovery		913794	<a href="https://ji.unfccc.int/JIITLProject/DB/1D4N29Y8OQJEF2BPYY0WSRW4WWDWGT/details">https://ji.unfccc.int/JIITLProject/DB/1D4N29Y8OQJEF2BPYY0WSRW4WWDWGT/details</a>

<sup>36</sup> Electric arc equipment of the Soviet period

<sup>37</sup> Not commissioned

	System in Alchevsk Coke Plant			
Alchevsk Steel Mill	Revamping of Sintering and Blast-Furnace Production	20	9246556	<a href="https://ji.unfccc.int/JIITLProject/DB/SH71YMI81FDOBH K65V7RHU1AOSQCX1/details">https://ji.unfccc.int/JIITLProject/DB/SH71YMI81FDOBH K65V7RHU1AOSQCX1/details</a>
Zaporizhstal	Energy Efficiency Increase in Steelmaking and Sinter Plants	20	434176	<a href="http://ji.unfccc.int/JIITLProject/DB/JOQRPTLWUXD0B 7CWP2ZLYT47D3YXW1/details">http://ji.unfccc.int/JIITLProject/DB/JOQRPTLWUXD0B 7CWP2ZLYT47D3YXW1/details</a>

References in the media concerning the sale of quotas:

- ISTIL Ukraine (Donetsk Electrometallurgical Plant)<sup>38</sup>
- Interpipe Steel<sup>39</sup>

<sup>38</sup> <https://www.epravda.com.ua/publications/2007/02/14/152431/>

<sup>39</sup> <https://www.epravda.com.ua/publications/2007/02/28/151911/>