

D2.2-UA, October 2020

Auctions for the support of renewable energy in Ukraine

Auction design for the planned 2020 RES auctions





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1 Introduction

On 22 May 2019, Ukraine adopted the law 2712-VIII “on promotion of competitive conditions for producing electric power from alternative energy sources” (IMEPOWER 2019; IEA 2019b), thus introducing auctions as the main instrument for the support of electricity from renewable energy sources (RES). Increasing support expenditures in the previous RES support scheme that was based on (high) administratively-set feed-in tariffs (FITs), as well as obligations/propositions by EU legislation were the main motivations for switching to the new auction-based support scheme. Although a first pilot auction could have been conducted in 2019, the newly elected government in Ukraine did not hold any auctions so far, due to ongoing negotiations on possible cuts on the level of the already allocated feed-in tariffs. These negotiations ended with the adoption of Law 810-IX (former Draft Law 3658), “on Amending Certain Laws of Ukraine to Improve Support of the Production of Electric Power from Renewable Energy Sources” (UWEA 2020; IMEPOWER 2020), that indeed implemented those (retroactive) cuts, among other provisions. Now, the first auctions are expected to be conducted in 2021.

Nevertheless, it is worthwhile looking into the Ukrainian auction scheme and providing a first analysis based on the proposed design elements¹. The remaining of this case study is structured as follows. Chapter 2 provides an overview on the overall electricity sector and the role of RES in Ukraine. Chapter 3 gives an overview of the preceding administratively-set feed-in tariff scheme. Chapter 4 describes and analyses the proposed RES auction scheme, while chapter 5 provides conclusions.

¹ We would like to thank the Ukrainian energy market expert Oleksii Mykhailenko from Low Carbon Ukraine for his contribution. His remarks, feedback, and explanations improved the quality of the report significantly.



2 Renewable energy sources and the electricity market in Ukraine

After the collapse of the Soviet Union, Ukraine fell into a severe recession. Declines in output and hyperinflation were common for former Soviet countries, however, the Ukraine was one of the most affected countries (The Economist 2014). As the GDP fell by more than half in constant dollar terms during the 1990s, also the primary energy supply decreased from 252.3 to 135.1 mtoe. After a period of recovery in the early 2000s, the economy underwent shocks due to the global financial crisis in 2008, the annexation of Crimea by Russia in 2014 and the war in Donbass. Therefore, the total primary energy supply fell further to 89.6 mtoe in 2017 as shown in Figure 1 (OECD 2019).

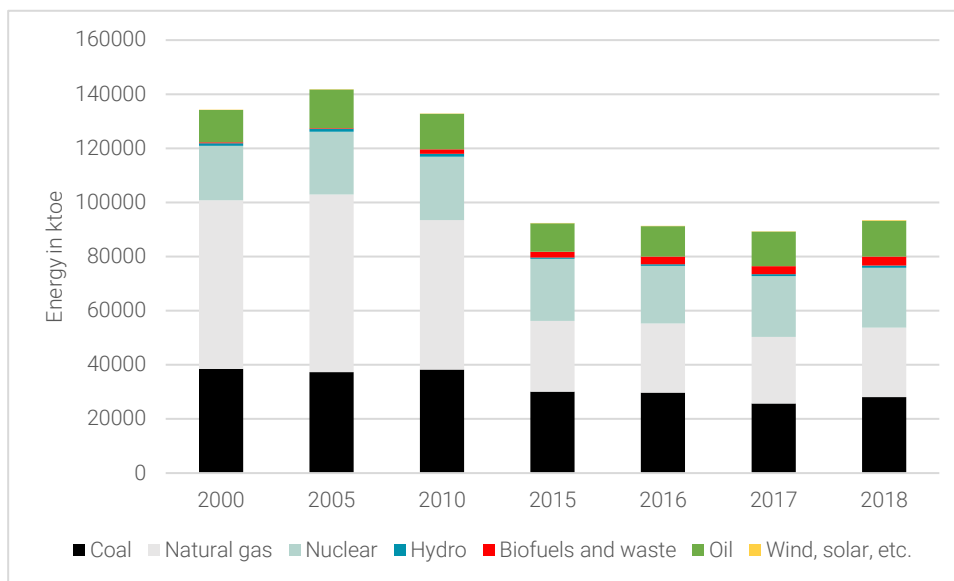


Figure 1: Total primary energy supply in Ukraine, source: IEA (2019a)

The war in Donbass led to a decline in coal production in the Ukraine by about 50%, as most coal mines are located in the Donbass region (OECD 2019). Consequently, the electricity generation by coal power plants decreased from 81.0 TWh in 2013 to just 46.5 TWh in 2019. This loss was partly absorbed by nuclear electricity generation, but the overall consumed electricity declined in this period as well.

Figure 2 shows Ukraine's electricity generation in 2019. Nuclear energy accounted for 55% of total electricity production, coal for 31%, and natural gas for 7% (IEA 2019a). Electricity from renewable energy sources (RES) plays only a minor role in the electricity generation mix (see Figure 2). Hydro energy is the largest source of renewable energy in the Ukraine, as it accounts for 5% of the generated electricity. The modernization and construction of hydro energy plants is part of the energy strategy of the Ukrainian government: in the period from 2014 to 2018, the energy production by hydro plants has risen by around 30%. However, only small hydro plants with a power output of up to 10 MW are subsidised by the feed-in tariff. Wind and solar energy contribute only a small, combined share of 1.6% to the generated electricity in 2019.

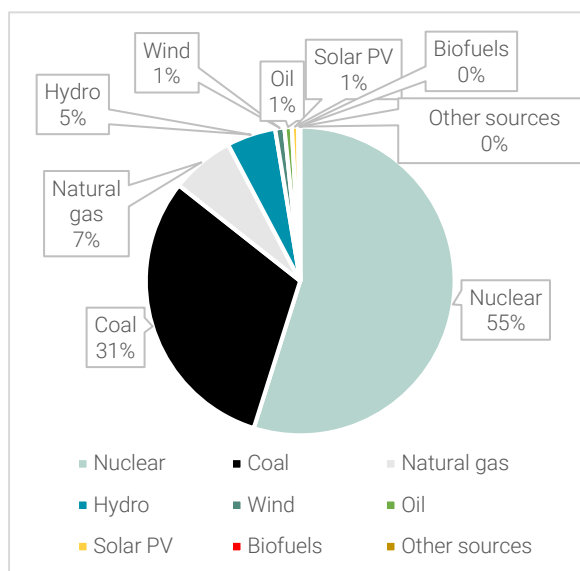


Figure 3 shows the installed RES capacity from 2010 to 2019. Here, a similar composition can be observed. Ukraine has historically had a large amount of hydro power capacities, which were between 4 GW and 4.7 GW from 2010 to 2019. Since 2018, solar capacities have been increasing significantly, with almost 6 GW of installed capacity in 2019, whereas wind power has not been deployed as intensively. A possible explanation of this increase is the discussion and ultimately the introduction of RES auctions in 2019. As investors and project developers might have expected the change of the support scheme towards an auction-based mechanism, they had the incentive to realise their planned project in the short-term so that they can take advantage of the relatively high FITs that would certainly decline due to the competitive nature of the auction mechanism. Furthermore, in contrast to the auction-related risk of not being awarded, the FIT scheme provides security in this regard, as project developers "only" need to realise their projects to receive the FIT. All of these reasons might have led to the surge in installed RES capacity in 2018 and 2019. Moreover, as of August 2020, a total capacity of around 12 GW of pre-PPAs – which entitle the RES generators to an administratively-set FIT without participating in the auctions – have been signed, with around 4 GW expected to become operational in 2020 (CEE Legal Matters 2020). Bioenergy and waste play rather a minor role, with only 340 MW of installed capacity.

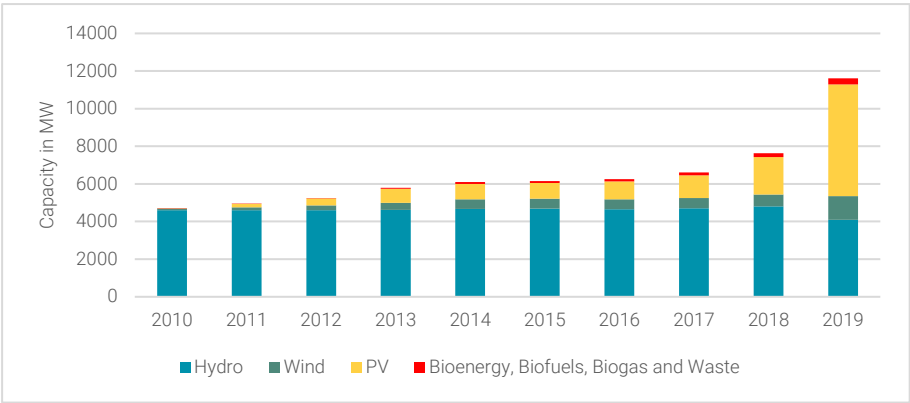


Figure 2: Development of total installed renewable energy power capacity, source: IRENA (2020)

When looking at the total primary energy supply, the mix is more evenly distributed with a share of less than 30% for coal, nuclear energy and natural gas respectively (OECD 2019). However, there is a positive development: Since 2010 the share of RES (hydro, biofuels and waste, wind and solar) in the total primary energy has increased from 2.1% to 4.6% in 2018 (see Figure 1).

The economic issues supported the reduction of carbon emissions, as the consumed energy decreased. However, the CO2 intensity of Ukraine's electricity mix has not declined significantly since 1990 (IEA 2019a). The low share of RES within the electricity mix are only one part of the problem. Furthermore, Ukraine's energy sector also struggles with the efficiency of the transformation from primary to secondary energy. In Ukraine, 45% of the total primary energy supply was used for energy transformation and distribution. This energy cannot be used purposeful and reduces the overall efficiency. Compared to the EU-28 states, where this rate is on average 38%, there is still room for improvement. All in all, the Ukraine is using nearly three times the energy per unit of GDP compared to the OECD average (OECD 2019).

The Electricity Market Law (passed in 2013), which organizes the electricity market reforms, was implemented in 2017 and its changes took effect in 2019. Ukraine's inefficiency and the energy intensity of its economy show the need for adaption in the regulatory environment of its electricity sector. Until July 2019, the wholesale electricity market was entirely run by a state-owned single buyer, Energorynok. In order to account for new regulatory and technical reforms and to adapt to the new electricity market design, the single buyer was split up into three firms. Additionally, the single buyer market model was replaced with a free market consisting of bilateral, intraday, day-ahead and balancing markets. On these markets, participants are supposed to be able to trade energy freely. Furthermore, nowadays, household electricity consumers are able to choose their supplier freely, but in practice, due to subsidised prices, most of the power to households is



supplied by the universal suppliers. These adaptations to Ukraine's regulatory environment were demanded by the Energy Community Treaty, with the Ukraine being the last contracting party to reform its electricity market. However, there were "numerous unresolved issues" upon the start of the free market model, including problems with IT platforms, transparency, data publication, transmission tariffs, financial guarantees and debts of energy companies. The single buyer model was not replaced entirely: In the first two months only 53% of electricity were traded in the new model and competition could not develop due to price caps and Public Service Obligations (PSOs) (Energy Community 2019).



3 Feed-in tariffs as the main renewable energy support instrument until 2020

3.1 RES targets, regulatory framework and available support instruments in Ukraine

The Energy Strategy of Ukraine (ESU), published in 2017, has outlined the technically achievable potential of RES generation in the Ukraine in 2035 (Cabinet of Ministers of Ukraine 2017). In 2035, bioenergy is expected to have the largest contribution with 11 Mtoe – having a share of 11.5% of total primary energy supply, followed by wind and solar energy with 10 Mtoe together – a combined share of 10.4%. In total, the ESU sets the target for renewables in the Ukraine at 25% of total primary energy supply in 2035, while RES are expected to provide around 19.5%, i.e. 35 TWh. of the total electricity generation in 2035 (OECD 2019).

The regulatory responsibility for the energy sector is split upon different institutions in the Ukraine. The most relevant are the Parliament of Ukraine, the Government of Ukraine, the National Electricity Regulatory Commission of Ukraine and the State Agency on Energy Efficiency and Energy Saving of Ukraine (Kurbatova et al. 2014). These institutions are able to set the boundaries for achieving the prior mentioned technical potentials of RES. In the Ukraine, a wide range of energy policy instruments and mechanisms are in place to support the expansion of RES in the electricity generation (Trypolska 2012; Kurbatova et al. 2014):

- Waivers from import duties for imported equipment and machinery for the construction of RES plants,
- waivers from VAT for plants generating green energy,
- a feed-in tariff (FIT)-scheme, which is called “Green Tariff”, and
- starting in 2020, a RES auction scheme for large-scale RES projects.

3.2 “Green Tariff”

In Ukraine, a FIT for solar power facilities (both ground-mounted and roof-installed), wind power plants, small hydro power plants and biomass power plants (only plant-based fuels) has been introduced in 2009 (Trypolska 2012). The tariff used to be only obtainable by selling the electricity to the wholesale energy market, run by the state-owned single buyer “Energoynok”.

After the reorganization and liberalisation of the electricity market, this obligation was passed on to the Guaranteed Buyer, a state enterprise, which is obliged to buy the whole amount of energy produced by RES and to subsequently sell this electricity at the (now liberalised) wholesale electricity market. The Guaranteed Buyer receives the funds needed to cover the difference between the FIT levels paid out to generators and the (usually lower) electricity market prices from the TSO Ukrenergo, which finances these payments through electricity tariff surcharges. In theory, due to the obligation to buy all electricity from RES, the government guarantees that the full amount of RES is subsidized during the support time. Nevertheless, in the first half of 2020, the Guaranteed Buyer was unable to meet this requirement due to a lack of funds, mainly due to lower electricity market prices and the inflexible design of the aforementioned levy system. This resulted in an accumulated debt of the Guaranteed Buyer towards RES producers of almost 500 mn EUR as of July 2020. Even after the recent cuts to the FIT levels, the TSO surcharge is still not expected to be sufficient to cover the Guaranteed Buyer's expenses (Mykhailenko 2020). Nevertheless, it remains to be seen whether the additional provisions in law 810-IX will be able to decrease the accumulated debt (see section 3.3).

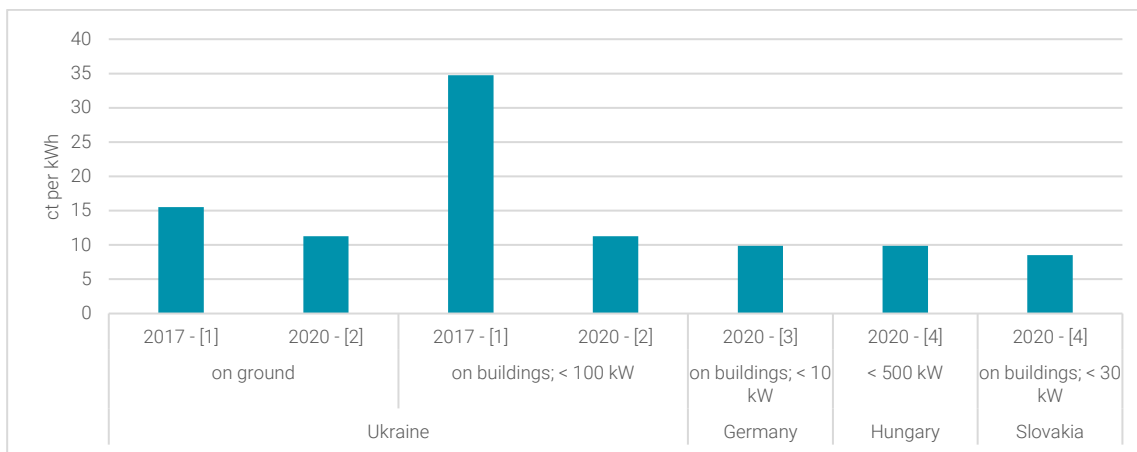


Figure 3: FITs in selected countries in Euro cents per kWh (Ukrainian FIT levels prior to the reductions foreseen in Law 810-IX) sources: [1] (PV Europe 2017), [2] (Sayenko Kharenko and Ukrainian Wind Energy Association 2019), [3] (Fraunhofer ISE 2020), [4] (RES Legal 2020)

After a first period of fixed FITs for power plants commissioned until 2013, the tariffs started to be reduced gradually until 2017. Between 2017 and 2020 the FITs underwent a more significant reduction due to the increasingly burdensome payment obligations. As RES auctions are expected to replace the FIT scheme, there is an ongoing transitional period of decreasing FIT levels until 2025 and 2030. The initial FITs for RES were at a remarkably high level, when comparing them to other European countries. Nevertheless, it should be noted that in contrast to most other European countries, where support payments are guaranteed for a fixed period of time, e.g. 15 or 20 years, the Green Tariff in Ukraine is only paid out until the end of 2029, irrespective of the project's date of commission. In order for RES producers to enjoy a longer support period, the FIT needs to be accessed through the new auction scheme (see below).

In 2013, Ukraine's FITs for PV plants laid well above the FITs of other European countries (Campoccia et al. 2014), which encouraged initial investment in the sector. Figure 4 displays the FITs in the Ukraine in 2017 and 2020 and in other European countries in 2020. In 2017 Ukraine's FITs for PV plants installed on buildings was 347.6 EUR/MWh, which was reduced in 2020 to 112.5 EUR/MWh, making the FIT level for small-scale projects comparable to FITs in Germany, Hungary and Slovakia. Nevertheless, the FIT levels for large-scale projects are still rather on the high end of FITs in Europe – especially compared to countries with RES auctions in place.

3.3 Retroactive feed-in tariff cuts and other provisions in 2020

Since late 2019, the RES industry in the country feared retroactive FIT cuts, after the government started related discussions. The surge in finished RES projects in 2019 led to a significant increase in support expenditures for RES, which led to an increasing debt of the Guaranteed Buyer towards RES producers. During the discussion, a complete cut of FITs was mentioned, however, the government started to negotiate with investors and other stakeholders (PV Magazine 2019).

After several months of negotiations, the government and the RES industry came to a conclusion and signed a Memorandum of Understanding in June 2020, which culminated in the passing of law 810-IX. The law foresees the following provisions and changes to the FIT levels of the Green Tariff (PV Magazine 2020):

- All RES plants commissioned before 30.06.2015: FIT capped at 245.9 EUR/MWh
- Wind power plants (with a wind turbine capacity of more than 2 MW)
 - Commissioned between 01.07.2015 and 31.12.2019: FIT reduction of 7.5% (FIT level of 94.1 EUR/MWh)
 - Wind power plants commissioned between 01.01.2020 and 31.12.2022: FIT reduction of 2.5% (FIT level of 88.2 EUR/MWh)
- Small-scale, ground-mounted solar PV projects (up to 1 MW):
 - Commissioned between 01.07.2015 and 31.12.2019: FIT reduction of 7.5% (FIT level between 156.9 EUR/MWh and 138.9 EUR/MWh)

- Commissioned after 31.12.2019: FIT reduction of 2.5% (FIT level 102.4 EUR/MWh and lower)
- Large-scale, ground-mounted solar PV plants (above 1 MW):
 - Commissioned between 01.07.2015 and 31.12.2019: FIT reduction of 15% (FIT level between 144.1 EUR/MWh and 127.7 EUR/MWh)
 - Commissioned between 01.01.2020 and 31.10.2020: FIT reduction of 2.5% (FIT level of 109.7 EUR/MWh)
 - Commissioned between 01.11.2020 and 31.03.2021:
 - FIT reduction of 30% (FIT levels between 78.8 EUR/MWh and 76.2 EUR/MWh) - capacity up to 75 MW
 - FIT reduction of 60% (FIT levels between 45 EUR/MWh and 43.5 EUR/MWh) - more than 75 MW
 - Commissioned between 01.04.2021 and 31.12.2021: FIT reduction of 60% (FIT level of 43.5 EUR/MWh)
 - No administratively-set FIT foreseen for PV projects larger than 1 MW with a commissioning date later than 31.12.2021

Although all of the cuts in the FIT levels have led to an increased uncertainty and a negative impact on the investment climate in the Ukrainian RES industry, it is still worthwhile looking in detail at the reductions for upcoming projects to assess their impact on project realisation.

The 2.5% reductions for upcoming onshore wind projects and small-scale PV projects below 1 MW are relatively minor and thus these projects can be expected to be realised.

On the contrary, the reductions in the FIT levels for large-scale PV projects are much more significant: for projects that are commissioned between 01 November 2020 and 31 December 2021, the reductions amount to 30% and 60% of the initially foreseen FIT levels, respectively.

It should be noted that these commissioning dates are mainly relevant for projects that have signed a pre-PPA. Until 31 December 2019, project developers of solar and onshore wind projects were allowed to sign a pre-PPA with the government that grants an exemption from the participation in the auctions and entitles those to an administratively-set FIT/Green Tariff. The main prerequisite is that these projects need to be commissioned within two (solar PV) or three years (onshore wind) from the signing date of the pre-PPA. Thus, looking at the aforementioned commissioning dates, especially large-scale PV projects are negatively affected by the FIT reductions: project developers are forced to either commission their projects by 31 October 2020 or to face a significant FIT reduction. Thus, these projects have practically a realisation period of 17 months in the best case (if the pre-PPA has been signed in June 2019) or of only 10 months in the worst case (if signed in December 2019), so that they face a reduction of the initially foreseen FIT of "only" 2.5%.

In case these projects need a longer realisation period, the 30-60% FIT reduction will most probably render them unprofitable. Taking into account the general, reduced support period for projects under the FIT scheme of around 9-10 years (the payments under the Green Tariff will end by 31 December 2029), we can expect the majority of large-scale PV projects with pre-PPAs to not be realised. It remains to be seen whether these projects will be completely abandoned, or whether project developers will opt to participate in the upcoming RES auctions scheme with those – thus possibly increasing the level of competition in the auctions significantly.

Furthermore, law 810-IX included several provisions that aim at ensuring investor confidence after the turmoil of retroactive cuts. One is the stabilization clause that ensures that the revised FIT levels will not be further changed. Furthermore, there are several possible mechanisms foreseen that should support the Guaranteed Buyer in meeting its payment obligations towards RES producers: increased payments by the TSO (35% of the income from cross-border capacity allocations), as well as public financing through the state budget and possibly the issuance of government bonds (IMEPOWER 2020).



4 The current state of RES auctions in Ukraine

In May 2019, Ukraine has adopted law 2712-VIII that sets the framework for the implementation of RES auctions and which was amended by law 810-IX. The resulting RES auction design, the main design elements, as well as the reasons for the delayed implementation of the auctions are described and analysed hereinafter.

4.1 Objectives of RES auction implementation

Regarding the government's motives for the implementation of auctions for RES, several reasons can be found. On the one hand, the FITs have become (too) expensive for the governmental agencies and thus the electricity consumers and on the other hand Ukraine's electricity grid faces stability problems with too high and possibly unlimited shares of RES and the resulting need for flexibility. Additionally, EU Guidelines on State aid for environmental protection and energy by the European Commission only allow support for RES operators that have been selected under the help of market instruments, such as auctioning/competitive bidding processes².

Prior to the recent cuts, the high FITs and the substantial growth in the RES sector would have resulted in annual payment obligations of 1.8 billion EUR from 2020-2030³ (Balkan Green Energy News 2019). A further issue with the FIT is the financial situation of the Guaranteed Buyer. In Ukraine, the payment obligations for RES are passed through to electricity consumers by the TSO Ukrenergo, which makes electricity more expensive for consumers. However, after the surge in the installation of RES in 2018 and 2019, that nearly tripled the non-hydro RE capacity in just one year, and the plumbing prices at the wholesale electricity market due to the Covid-19 pandemic, the Guaranteed Buyer has run deficits in 2020 and could not meet its payment obligations towards RES producers (see section 3.2).

The FIT support scheme only provides limited options for policymakers to regulate the volume of newly installed RES projects in an efficient manner. By using RES auctions this problem can be addressed, as the volume for auctions is usually fixed and thus gives full discretion to the auctioneer/regulator. The volume is set by the Cabinet of Ministers of the Ukraine (CMU) in consonance with a proposal by the TSO (see Table 1) and should therefore be orientated according to the capability of the electricity grids and the goals for RES of the Ukraine.

4.2 General economic environment and cost of financing

The investment in a developing country like Ukraine, that has seen political turmoil in recent years and is still in political tensions, is generally linked to higher risks than developed countries. Investment risks for RES projects in Ukraine include: little security for foreign investors (in terms of intellectual property rights and a high level of endemic corruption); the dependency on Russia and ongoing diplomatic tensions with it; a long-term decline in industrial production since 2009; a high rate of inflation at 14% in 2017 (Société Générale 2020). In the "doing business" score, which is measured by the World Bank and which reflects the regulatory environment and the protection of property rights in a country, Ukraine scored 64th out of 190 economies. This rank has increased from 76th in the 2018 report (World Bank Group 2020).

Ukraine's high interest rate on bank loans are a further hurdle for RES investments. In the period from 2010 to 2020, bank lending rates have been between 12% and 18.5% (Trading Economics 2020), which imposes high costs of debt on companies. Moreover, it remains to be seen how large the negative impact of the recent retroactive FIT cuts will affect the cost of financing in Ukraine.

² The guidelines allow to exclude developers of small-scale RES, as auctions may not be practical, or RES technologies, that are still in a demonstration phase and therefore need specific funding.

³ It should be noted that these are the gross payment obligations to RES producers based on their FIT levels. The actual net payments/subsidies that need to be financed via the TSO surcharges is much lower, as the Guaranteed Buyer sells the procured electricity on the wholesale electricity markets and thus gains additional income.



4.3 De-risking policies for RES projects

Whereas the World Bank offered loans mainly to hydro power and grid related projects to improve Ukraine’s energy situation, the European Bank for Reconstruction and Development (EBRD) concentrates on RES projects. The Ukraine Sustainable Energy Lending Facility (USELF), a loan program by the EBRD, supports the fulfilment of the goals of the Ukrainian government on its path to higher shares of RES and introduce more competition in Ukraine’s electricity sector that is dominated by state-owned enterprises. Loans within the USELF are available to local and international project developers in the renewable energy business. Programs like the USELF, which is already in its third round, have led to a total investment of 1 billion EUR by the EBRD in Ukraine’s power sector. The EBRD aims at continuing its engagement in the Ukraine through the transitional period from the FIT to the auction scheme. Similar to the FIT scheme, investments from international financing institutions will play a crucial role in de-risking auctions in Ukraine (EBRD 2018).

Auctions and PPAs are executed in the currency EUR, giving project owners more financial stability. The price for purchase of the produced power, which was agreed upon in the PPA, will be paid out in EUR as of the date of the auction, in accordance with the official exchange rate of the National Bank of Ukraine. These payments are expected to be paid by the Guaranteed Buyer on a monthly basis (Balkan Green Energy News 2019).

4.4 Characteristics and design elements of the RES auctions

This chapter highlights the characteristics and design elements of the RES auctions in the Ukraine according to the law 2712-VIII “on promotion of competitive conditions for producing electric power from alternative energy sources” from May 2019 (IEA 2019b; IMEPOWER 2019) with amendments foreseen in the recently introduced law 810-IX “On Amendments to Certain Laws of Ukraine on Improving the Conditions for Promoting Electricity Generation from Renewable Energy Sources” from July 2020 (IMEPOWER 2020).

Table 1: Main characteristics of auctions and framework conditions

Characteristics	Description
Contractual counterparty	The state enterprise “Guaranteed Buyer” buys the electricity from the producer at the awarded auction price under a Power Purchase Agreement (PPA). The PPA needs to be signed within 15 working days after the auction results are published.
Main features	The planned RES auctions in the Ukraine are multi-unit, one-stage, sealed-bid auctions. Bids contain a price offer (EUR/kWh) and the size (kW) of the power plant that the bidder wants to receive support for.
Technology focus and differentiation (eligible technologies)	The annual quotas are set for the wind, solar and other RES technologies separately. In addition, when setting the annual quotas, the CMU can decide whether to conduct multi-technology or site-specific auctions, as law 810-IX specified. The quotas for the technologies are based on proposals of the TSO and the State Agency on Energy Efficiency and Energy Saving of Ukraine.

Competition rules	<p>In order to ensure competition, the following rules are set:</p> <ul style="list-style-type: none"> • The total capacity that can be awarded may not exceed 80% of the aggregate capacity of submitted bids • The share of the annual quota (within the two annual auctions) that can be rewarded to one participant or multiple participants, that are related parties or have the same beneficial owner, may not exceed 25% of the annual volume
What is auctioned?	Installed capacity (MW)
Budgetary expenditures per auction and per year	No maximum budgetary expenditures are explicitly stated
Frequency of auctions	<p>Originally foreseen to take place twice annually before 01 April and 01 October</p> <p>Law 810-IX abolished these provisions and gives the CMU full discretion regarding the auction schedule and dates</p>
Volume of the tender	<p>Volumes are to be set annually for a five-year period by the Cabinet of Ministers of Ukraine. Specific volumes for the technologies wind, solar and other RES should not be less than 10% (reduced by law 810-IX from initially 15%) of the total volume.</p>
Grid connection/access related costs	<p>Grid connection have to be borne by the project developer who is eligible for support under the FIT scheme or the auction scheme. However, as a pre-qualification requirement a concluded grid connection agreement needs to be submitted.</p>
Balancing and profile costs	<p>As stated in the law 810-IX, from 01 January 2021 RES operators (with projects >1 MW) will have to bear 50% of the cost for imbalances created by their RES projects, while starting from 2022, they will have to bear the full cost.</p> <p>Until the end of 2029, RES producers are exempted from balancing costs in hours during which their imbalance rate is below 10% for wind operators, 5% for solar and 5% for all other RES operators.</p>

Table 2: Design Elements

Design elements	Description
Auction format	Static, sealed-bid auction with pay-as-bid as the pricing rule
Eligible technologies and obliged technologies	<p>Wind power plants with more than 5 MW (Law 810-IX deleted the exception of projects with up to 3 turbines) and solar plants with more than 1 MW are obliged to take part in the auctions.</p> <p>All other RES types can take part on a voluntary basis regardless of their power capacity in the auctions or use the FIT-scheme with support until the end of 2029.</p>
Auction procedure	<p>Bidders submit their sealed bids to the ProZorro system, the Ukrainian state-run e-auction platform. The bids include the technical proposal (power capacity) and the price offer (price per kWh). The winners are determined by opening the bids simultaneously, with price offers being the only criterion. The results are published electronically.</p> <p>Within 15 working days the auction winners and the Guaranteed Buyer must sign a PPA, which is also published in the electronic trade system.</p>
Pre-qualification requirements	<p>Pre-qualification requirements are set to achieve a higher realisation rate. These are:</p> <p>Material pre-qualification:</p> <ul style="list-style-type: none"> • confirmation of a right for land ownership/use • concluded grid connection agreement for the project • disclosure of beneficial owners, information about management and related parties • extract from the Unified State Register of Legal Entities, Individual Entrepreneurs and Public Organizations of Ukraine <p>Financial pre-qualification:</p> <ul style="list-style-type: none"> • Bid bond of 5 EUR/kW. It is refunded to unsuccessful bidders after the auction and to successful bidders after signing the PPA. • Additionally, successful bidders must submit a performance bond of 15 EUR/kW after signing the PPA
Auction volume	The auction volumes have not yet been announced.
Pricing rule	Pay-as-bid

Award procedure	Price only
Price limits	<p>Initially, ceiling prices would have been set for wind and solar by their respective FITs at the time of the auction. For other RES, the FIT for biomass as of 01.01.2020 would have acted as the ceiling price.</p> <p>After the adoption of Law 810-IX, the ceiling prices for PV and wind are fixed at 9 ct/kWh until the end of 2024 and at 8 ct/kWh starting from 2025. The ceiling price for other RES technologies is set at 12 ct/kWh, irrespective of the year.</p>
Support period	Support is granted for 20 years after the project is commissioned.
Local content rules	<p>The local content rule of the FIT scheme stays in place. Projects with more than 30% local equipment get a 5% increase in the awarded bid price. If more than 50% are of local origin the support increases by 10%.</p> <p>In addition, Law 810-IX introduced a 20% increase in support if more than 70% of the equipment are from local origin.</p> <p>After 6 years of operation of the power plant, the increase of the FIT level is capped at 10%.</p>
Realisation time limit	<p>2 years for solar 3 years for wind and other RES</p> <p>A one-year extension is possible, when a further performance bond of 30 EUR/kW is paid.</p>
Penalties	<p>The bid bonds (5 EUR/kW) of successful bidders, that do not sign a PPA, are retained and transferred to the Guaranteed Buyer. Additionally, the bidders are banned from taking part in auctions for one year.</p> <p>Similarly, the performance bonds (15 EUR/kW) of RES developers, that have signed a PPA, but do not finish the construction of their power plant, are retained.</p>
Form of support auctioned	Feed-in tariff with the Guaranteed Buyer as the counterparty
Support level adjustments	No
Transferability of support right	n/a
Other	The CMU can decide to conduct project-specific auctions in designated areas (e.g. in Chernobyl Exclusion Zone) for pre-developed projects in which the land and the grid connection are provided by the government.

The flexibility of **volume announcements and thus auction schedule** can be an issue for the long-term planning of RES developers and investors, as the volumes can be changed annually. A change of policy makers due to elections or shifts in politics can therefore easily lead to a loss of the sunk costs that incur for companies before the auctions. A predetermined and unchangeable definition of yearly quotas several years in advance would give investors more certainty.

This issue is worsened by the retroactive FIT cuts, as it serves as a precedent for the unreliability of volume announcements in Ukraine.

Within the auction scheme two rules are in place to **promote competition** among bidders. On the one hand, during a single auction, the capacity that is rewarded to the winners of the auction may not exceed 80% of the capacity submitted by all bidders during the auction round. Thereby, a sufficiently high number of RES developers is not successful in the auctions, which promotes competition. However, it is not entirely ensured that participants do not propose “fake bids” with unrealistically high prices to fulfil this rule and thus secure an award for their “real projects”. Furthermore, such an automatic volume adjustment might have mid- to long-term negative effects on the investments and further worsen the issue of low competition (AURES II 2020). On the other hand, the share of the annual quota (within the two annual auctions) that can be rewarded to one participant or multiple participants, that are related parties or have the same beneficial owner, may not exceed 25% of the annual quota. Thereby, the legislation ensures actor diversity and enough competition in the short- and mid-term, so that there are enough different firms that compete against each other for the support. Nevertheless, this rule appears to be technology-neutral and therefore it is still possible that a single firm has a monopolistic position within one technology.

The preceding **FIT scheme** stays in place in an adapted form until 2030 and **interacts with the auction scheme**. Developers of solar power plants with a capacity of more than 1 MW and developers of wind power plants with more than 5 MW are obliged to take part in the auction and may not receive support from the FIT scheme. However, all other RES developers are free to participate in the auctions or choose the adapted FIT. Therefore, developers of small-scale RES projects will have to decide whether they use the FIT until 2030 or participate in the auctions with a support period of 20 years. This exemption from mandatory auction participation for small-scale RES projects (de-minimis rule) aims at ensuring actor diversity in the RES landscape and at supporting smaller players, but it comes with one caveat: large project developers might try to circumvent the threshold for participation in the RES auctions by dividing their projects into smaller ones. Currently, in Ukraine, there is no regulation in place, which addresses this issue, such as e.g. in Greece⁴. However, the recent decrease of FITs in Law 810-IX might have decreased the incentives and thus the risk of project developers behaving in this manner.

In the Ukrainian RES support system, all RES producers – irrespective of their project's size – can **voluntarily participate in the RES auctions**. Combined with the reduced support period of the administratively-set FIT, this might lead to a high number of small projects (below the mandatory auction threshold) to submit bids in the auctions. This can lead to an unfavourable outcome in the auctions: if the market players are significantly different (strong vs weak), especially in terms of financial capacity (access to capital and economy of scale), then under insufficient competition, the strong players might bid higher and lean their bids towards the weaker bidders, that tend to have higher cost and thus higher bid prices. This leads to an unnecessary overcompensation of the larger bidders. Hence it would be better to have these diverse players compete in different segments, i.e. conduct separate auction rounds for small- or medium-scale and large-scale projects – so that the risk of such overcompensation is reduced. The lack of a maximum size in the Ukrainian auction scheme makes such a division even more relevant.

In Ukraine's RES auction law **several pre-qualification criteria** are in place to reduce the risk of undesired strategic behaviour and to guarantee the seriousness of bidders. **Bid bonds** in Ukraine are set at a 5 EUR/kW, which is refunded to unsuccessful bidders after the auction and to successful bidders after signing the PPA. Additionally, successful bidders must submit a **performance bond** of 15 EUR/kW when signing the PPA. The

⁴ In Greece, a company or their individual shareholders are only allowed to have two projects in the administratively-set FIT/FIP scheme, thus disincentivizing project developers from splitting up their projects (<https://www.internationallawoffice.com/Newsletters/Energy-Natural-Resources/Greece/Rokas-Law-Firm/RES-sector-reform-regulatory-update>). Nevertheless, this provision obviously limits smaller actors from developing a portfolio of small-scale projects that would typically not participate in the auction scheme anyway.



goal of the bid bond is to discourage strategic fake bids, which block competitors by outbidding them without realising the project, and to ensure project completion through the performance bond. In comparison to other countries however, these bonds might be too low to be effective. In Germany, in onshore wind auctions, the bid bond amounts to 30 EUR/kW (without a performance bond), while in the PV auctions, the bid bond is 5 EUR/kW and the performance bond 45 EUR/kW. In Greece, the bid bonds are 10 EUR/kW for PV and 12.5 EUR/kW for onshore wind, with the performance bonds amounting to 40 EUR/kW and 50 EUR/kW respectively.

Additionally, auction participants need to provide a **confirmation of land ownership** or the right to use the land. Thereby, the cost for fake bids is heightened and the realisation of projects becomes more likely, as it decreases the risk of legal disputes regarding the land after the auction. However, this requirement imposes risks on the developers as it is still possible that they might lose within the auction and still face the costs of land ownership. This risk is likely to be priced in within the bids, making the support more costly. In addition, the participants need to provide a **concluded grid connection agreement**.

The Electricity Market Law of Ukraine (11 June 2017) defines the imbalance responsibility for RES producers. The Guaranteed Buyer will be responsible for the imbalance settlement of RES producers belonging to its balancing group while RES producers outside this balancing group will be responsible for covering the costs of their imbalances on their own. Till the end of 2029 wind generators have financial liability for their imbalances only if their hourly imbalance rate exceeds 10%. In case of solar power plants this rate is 5%, the same as for other RES producers. Furthermore, Law 810-IX ended an ongoing discussion on the imbalance costs: from 2021, RES producers (with projects larger than 1 MW) need to cover 50% of their balancing costs, and from 2022 on, they need to bear full responsibility for their balancing costs, i.e. 100%.

A key question arises concerning the balancing costs of RES producers: How can potential bidders incorporate the imbalance settlement costs in their bids in future RES auctions, if the cost of imbalances is not known in advance (as no liquid balancing market exists yet)? Even if the introduction of this cost element is gradual, this brings uncertainty in the revenue stream of the project owners. One way to handle this issue is to include a high-risk premium element in their calculated bids, which, however, increases auction prices and entail additional burden for electricity consumers.

One related issue is the **RES curtailment** required for system balancing purposes. The Electricity Market Law also provides for compensation to RES producers in case of any curtailment. However, although the methodology is already drafted, it is not yet implemented but expected to start in 2021. RES producers will be compensated for curtailed electricity production based on their level of FIT, while the occurring compensation expenditures will be socialised via the TSO tariffs. This mechanism is expected to strengthen investor confidence as it decreases the risk of monetary losses due to curtailment.

4.5 Delays in the implementation of RES auctions

Although the RES auction law has laid a clear path for the timing of auctions in the country, no auctions have taken place so far. A non-mandatory pilot auction could have been conducted until 31 December 2019, while the regular auctions were supposed to start in 2020.

Ukraine's RES auction law was passed in May 2019, shortly before a snap election was called by the newly inaugurated president Zelensky. After his landslide victory with a one-party majority in the parliament, his government does not seem to prioritize RES support: the deadlines on publishing support quotas/auction volumes by the CMU, which are a prerequisite for the auctions, have been missed and thus no auctions have been held until now. One of the reasons is the aforementioned surge in RES in 2018 and 2019 under the FIT-scheme that have led to a large financial liability for the Guaranteed Buyer, as well as the large amount of concluded pre-PPAs that would worsen this issue. Thus, Zelensky's government started discussions about retroactive FIT cuts and cut-off dates for pre-PPAs eligible for FIT after 2020 which ended with the adoption of law 810-IX.

Although the auction scheme itself seems to be suitable to ensure an efficient and effective RES expansion, the greatest challenge will be to win back investor confidence after the recent FIT cuts, as well as the delayed auction implementation. Otherwise, it will be difficult to ensure a sufficiently high level of competition in the upcoming RES auctions. The stabilization clause and refinancing mechanisms in law 810-IX are a good first



step, nevertheless, it will be crucial that 1) the government and mainly the Guaranteed Buyer will be able to meet their payment obligations towards RES generators soon, 2) the CMU will announce the auction volumes for 2021 and beyond, and 3) investors and project developers are going to trust the government's promises after the recent turmoil in the Ukrainian RES sector.



5 Conclusions

The situation of RES support in the Ukraine can be concluded as the following:

- Ukraine's FIT scheme boosted RES to about 5% of electricity generation in 2019. However, the comparatively high levels of FIT led to massive support expenditures and thus a high debt towards RES producers.
- The RES auction scheme aims at being more cost-efficient than the preceding administratively-set FIT scheme ("Green Tariff"), while still allowing Ukraine to reach its 2035 targets.
 - The overall auction design seems to be suitable to ensure an efficient and effective RES expansion.
 - Pre-qualification criteria, such as bid bonds, a confirmation of land ownership and a grid connection agreement, lower the possibility of project non-realisation and make fake bids more costly.
 - From January 2021 on, RES developers will bear (partial) financial responsibility for imbalances incurred by their RES projects, which can be expected to lead to higher bids, as these risks are priced in.
- The discussions and the FIT cuts in law 810-IX, the outstanding debt of the Guaranteed Buyer, as well as the delays in the auction implementation might have a severe negative impact on the RES sector in Ukraine. It remains to be seen how this will impact the level of participation and thus the competition in the first RES auctions.



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AURES II is a European research project on auction designs for renewable energy support (RES) in the EU Member States.

The general objective of the project is to promote an effective use and efficient implementation of auctions for RES to improve the performance of electricity from renewable energy sources in Europe.

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