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DEBT CRISIS IN THE ELECTRICITY MARKET: CAUSES AND THREATS TO THE ECONOMIC SECURITY OF ELECTRICITY COMPANIES

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The article states that one of the main sector conditions for Ukraine's accession to the European Union is the launch of a full-fledged energy market, for which purpose a number of institutional, economic and regulatory reforms have been implemented since 2015. It is proved that despite the government's conscientious efforts to make a transition to the European model of energy markets, Ukraine has failed to do so due to a large number of regulatory restrictions on wholesale prices (price caps), an unbalanced policy of supporting renewable energy industry, the absence of market prices for households and the existing mechanisms for imposing special obligations, which together have led to the formation of a chain of debts "all to all" in the electricity market. It is substantiated that the debt crisis currently observed in the energy sector of Ukraine requires urgent measures. Further ignoring it is unacceptable, as it poses significant threats to both the country's energy security and the financial viability of electricity companies. The article considers the chain of debts of electric power enterprises formed through the Public Service Obligations (PSO) model. The causes of the debt crisis in the Ukrainian electricity market are identified, including: incorrect operation of the PSO mechanism; significant underfunding of tariffs for households, as well as tariffs for electricity transmission services via the high-voltage trunk network and power system management (dispatching); granting debtors a preference - depriving them of «punishment» for late payment of the cost of consumed services. The author analyses the proposed measures to mitigate the crisis by: compensation of debts at the expense of the State budget; attraction of loans from State and international banks; cancellation of price restrictions established by the National Commission for State Regulation of Energy and Public Utilities (NCSREPU), the so-called price caps; allocation of part of the excise tax revenues to repay the debts incurred in the electricity market; increasing the volume of clean electricity exports to the EU; introduction of a market for guarantees of origin, under which each renewable energy producer will receive guarantees, i.e. an asset that can be sold. The advantages and disadvantages of each of the proposed measures are indicated.

Keywords: debt crisis, debt chain of "all to all", mechanism of imposing special obligations, "distortions" in financial settlements between electricity market participants.

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Introduction and statement of the problem

One of the key requirements for Ukraine's accession to the European Union is the establishment of a comprehensive energy market. To meet this objective, a range of economic, institutional, and

regulatory reforms have been implemented since 2015. Unfortunately, Ukraine has not been able to transition to the European energy market model due to numerous regulatory restrictions on wholesale prices (price caps), an ill-conceived renewable energy support policy, the

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Debt crisis in the electricity market: causes and threats to the economic security of electricity companies

lack of market prices for the general population, and the current Public Service Obligation (PSO) mechanism. This has led to the creation of a debt chain in the electricity market, totaling over UAH 60 billion, and posing a significant threat to the economic security of electricity producers.

Analysis of recent research and publications

The latest research and publications show that the reform of the electricity market and its consequences interest government officials, scientists, and practitioners. In particular, the specified problems are comprehensively addressed in the works of domestic scientists including Plotkin J., Levchenko N., Shyshkanova G., Levchenko S. [1], Manzhelo O. [2], Chaika O. [3], Kryvolap K. [4], Korolchuk Yu. [5], Topalov M. [6], Hryb V. [7] and Dubovskyi O. [8]. The authors focus on the new PSO (Public Service Obligation) model, which imposes special obligations to protect public interests. They specifically examine the mechanisms for implementing this model, including PSO's role in ensuring affordable electricity supply to households and PSO's supporting production from renewable energy sources (RES).

However, despite the work of a broad range of specialists, there is still a lack of research on “distortions” in financial calculations between participants in the electricity market. These distortions have led to a significant debt crisis in the market, and there is an urgent need for research to explore ways to mitigate them. Nevertheless, determination of such factors requires a comprehensive analysis of the causes of the debt cycle, underscoring the significance of the selected research topic.

The aim of the article

The article aims to conduct a comprehensive analysis of the factors underlying the debt crisis in the electricity market of Ukraine, exploring potential measures to mitigate it.

Presenting the main content

The strategic direction of Ukraine is towards European integration, signaling the country's unwavering commitment to further EU integration. As such, Ukraine will transition its electric energy market to the European model which prioritizes liberalization, transparency, and integrity. Additionally, the country will focus on promoting competition and enabling the free formation of energy prices, while adopting European market practices and culture [7].

Therefore, since 2015, Ukraine has undertaken reforms in the electricity market, including the adoption of legislative acts and introduction of the PSO model, resulting in a transition from a commodity to a financial implementation mechanism. However, the complete integration of Ukraine's electricity market

requires the elimination of regulated non-market electricity tariff formation. This structure is a stable remnant of the Soviet era that the government was unable to abolish due to various socio-economic factors, primarily the inability of a significant portion of the population to afford the full electricity cost.

In August 2021, the Cabinet of Ministers of Ukraine (CMU) adopted amendments to Resolution No. 483 dated June 5, 2019 [10], according to which a new model of PSO was introduced from October 1, 2021, which provided for the transition from a commodity to a financial mechanism for its implementation. According to the financial model of the PSO, producers of electric energy, who are assigned special duties, sell 100% of electric energy under market conditions, and at the expense of the received income provide compensation for the difference between the tariffs for the population and the market price of electric energy for the universal service provider (USP) [2]. So, currently the household consumer in Ukraine pays only half of the real cost of production, transmission and distribution of electricity. And if under the previous market model, this burden was distributed among all other categories of consumers, as a result of which the cost of electricity for the country's economy increased. Under the current model, price distortions are compensated at the expense of the most important electricity producers and market entities, which are determined by the participants of the PSO mechanism - State Enterprise National Nuclear Energy Generating Company “Energoatom” (commonly known as just Energoatom) and PrJSC “Ukrhydroenergo” [2]. But, as noted in the materials of the National Commission for State Regulation of Energy and Public Utilities (NCSREPU), Energoatom, which has to cover about 90% of the financial burden of providing a preferential electricity tariff for the population, is financially unable to do so in full. Since after deducting the costs for the PSO service from the net income for operating activities, only 11.5 billion UAH remain in Energoatom with operating costs of 18.4 billion UAH [2].

So, as of the end of October 2023, a chain of debts of «all before all» was formed on the electricity market, totaling more than UAH 60 billion. In the list of debtors and those to whom they owe money, the biggest players are Energoatom, Ukrenenergo, Guaranteed Buyer, DTEK, Centerenergo, suppliers, regional energy, exporters, consumers [6] (Fig.).

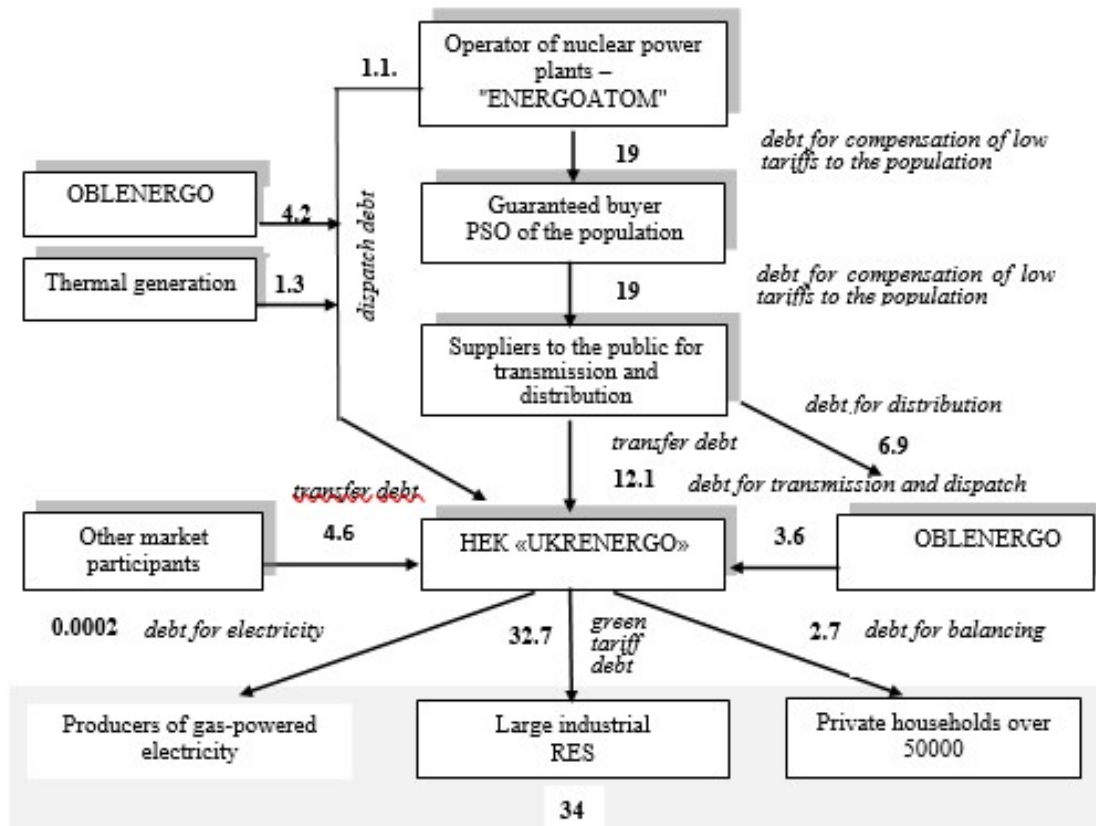
The reasons for the emergence of large-scale debts were.

First. Incorrect operation of the PSO mechanism. Thus, due to the pile of debts, in June 2023, the operator of the Ukrainian nuclear power

plants (NPP) Energoatom received a lawsuit for a record 32.5 billion UAH from another state company – Guaranteed Buyer. As you know, since October 2021, by the government’s decision, the Energoatom NPP will subsidize a low tariff for the population by compensating suppliers for the difference between the market price of electricity and the established tariff for the population. In 2022, the turnover of Energoatom, as noted in the YouControl system, amounted to UAH 134 billion. This year, according to Energoatom, the amount of compensation for low tariffs for the population is expected to be UAH 130 billion, and the cost of electricity production is UAH 53 billion. Therefore, the company’s capabilities are not enough, and as a result, debts are generated [3].

To correct the situation, in May 2023, the government increased tariffs for the population by

57–83%, from UAH 1.44 per kWh to UAH 2.64 per kWh. This allowed the Energoatom NPP to cover the previous debts to the «Guaranteed Buyer» for almost UAH 2.1 billion in September, and the same amount in October. However, the new tariff for the population is UAH 2.64/kWh, if we consider all the components from which it is formed (the wholesale price at which the supplier purchases electricity in various segments of the wholesale market; the transmission tariff; the distribution tariff; the supplier’s margin (USP tariff for the supply of electricity is approved by the NCSREPU); taxes, etc.) again does not cover even half of the market-determined price of electricity for the population as of June 2023 [2]. Therefore, companies continue to be forced to supply electricity to household consumers at a price that is almost half below the market price [3].



Formation of a chain of debts of electric power enterprises through the PSO model as of the end of 2023

The increase in the tariff for the population was only a prerequisite for the regulator’s decision to increase the maximum prices on the wholesale electricity market by 50-80 % (depending on the hours of consumption). This, in turn, can lead to higher prices for industrial consumers and, accordingly,

will become an additional burden on everyone, including the population, with whom business will share the burden due to higher prices for goods and services. Therefore, the formation of «distortions» in financial calculations between participants of the electricity market will continue in the future, which

sooner or later will put the government in front of the need to equalize them at the expense of the next increase in electricity tariffs for both the population and businesses. Therefore, tariffs and price tags for goods will inevitably creep up to the upper limits. However, whether this will have the expected effect on mitigating the debt crisis in the electricity market is quite difficult to predict, since it is currently difficult to assess and predict the solvency and payment discipline of consumers, taking into account the significantly destroyed economy of the country, migration and deterioration of the economic well-being of the population [2].

Therefore, in order to close the hole and compensate the Guaranteed Buyer for the costs of supporting low tariffs for the population, Energoatom called on the government to allocate UAH 34.9 billion from the budget for 2024. However, funds for subsidizing a low tariff for the population are not provided for in next year's budget [3].

Second. Significant underfunding of the tariffs of PJSC «National Energy Company "Ukrenergo" (hereinafter – Ukrenergo). The main sources of income of Ukrenergo are payment by market participants for the services provided in the transmission of electricity through the high-voltage main network and power system management (dispatching). At the same time, Ukrenergo must spend more than 80% of its revenues on payment for energy system balancing services (fee for provision of reserves in the market of auxiliary services) and implementation of PSO, which is practically impossible due to a significant reduction in electricity consumption, rapid growth of costs and significant losses due to the full-scale invasion of the Russian Federation on the territory of Ukraine. Therefore, debt obligations to compensate the Guaranteed Buyer for the difference between the "green" tariff and the market price of electricity for solar and wind power plants as of October 24, 2023 amounted to UAH 31.2 billion [11]. At the same time, market participants' debts to Ukrenergo for payment of tariffs for transmission, dispatch management and services on the balancing market as of the same date amounted to UAH 48.8 billion [11].

Understanding the complexity of the situation, the Ukrenergo intensified its claim-lawsuit work with its debtors. Currently, the courts are considering 443 such cases for the total amount of the principal debt – about UAH 50 billion. However, market participants are in no hurry to settle with the Ukrenergo for services and are accumulating debts. The reason is that by its decisions, the NCSREPU actually gave the debtors preferences – the deprivation of their "punishment" for late payment of the Ukrenergo for

the services consumed. Therefore, in particular:

– Resolution of the NCSREPU No. 332 dated 25.02.2022 [12], namely Clause 16 prohibits the calculation and collection of fines provided for in contracts concluded in accordance with the Law of Ukraine "On the Electricity Market" No. 2019-VIII dated 13.04.2017 [13] between participants of the electric energy market";

– Resolution of the NCSREPU No. 1231 dated 07.05.2023 [14] deferred payments for electricity transmission services for the largest debtors.

Therefore, it is not worth waiting for debt repayment in the near future.

It should be noted that the peculiarity of the electricity market is that there is a complex settlement mechanism between its participants, and if one person stops paying, then debts begin to form throughout the chain [6].

The insane debts owed by the Ukrenergo and the Energoatom affect the entire energy sector, lead to a large liquidity deficit in the market and create significant threats to the economic security of electric power enterprises. Therefore, there are currently active discussions among government officials, scientists and practitioners regarding possible ways to overcome the debt crisis in the electricity market, which boil down to the following:

– debt compensation with state budget funds. However, in this way, it is possible to solve only the problem of current debt. In the future, the Energoatom will continue to accumulate debts for PSO;

– the attraction of loans from state and international banks, which, in our opinion, will only lead to a change in the creditors of the Energoatom, an increase in the company's financial dependence due to bank interest, payment of the cost of bank loan servicing services, etc. But the causes of the debt crisis cannot be avoided in this way, and therefore, debts will continue to exist;

– annulment of the price restrictions established by the NCSREPU, the so-called price caps. The established price restrictions create a situation in which, in times of shortage in the energy system, it is difficult to balance it at the expense of imports, since it is unprofitable for electricity suppliers to import the resource into Ukraine due to low tariffs. According to the JSC "Market Operator", if in February 2023 the average prices for electricity at day-ahead market (DAM) in Ukraine were lower than the average prices for DAM in Romania, Slovakia and Hungary by more than 1.9 times, then already in March a similar ratio was 1.4, in April – 1.5, in May – 1.2 times [2]. Therefore, under such conditions, the system operator of Ukrenergo is forced to cover the deficit in the

energy system using emergency assistance. But there are several nuances here:

– firstly, emergency aid is much more expensive than importing electricity, due to which Ukrenergo is forced to spend additional funds to cover the deficit, while this money could be directed to strengthening Ukraine's energy security or repaying debts in the energy sector;

– secondly, emergency assistance is not always available [5]. Currently, European neighbors are providing assistance to Ukraine, but in winter they may not have capacity reserves and will not be able to do so;

– thirdly, if all the financial conditions are created to ensure commercial imports, traders will be able to negotiate in advance with European suppliers about the necessary volumes of electricity, which will be stably supplied to the Ukrainian energy system [4];

– fourthly, channeling part of the revenues from the payment of the excise tax (which is paid by electricity producers for the electricity produced) to finance budget programs aimed, in particular, at the repayment of debts incurred on the wholesale electricity market;

– fifthly, increasing EU exports of «clean» electricity, which is trying to accelerate Europe's transition to clean electricity, as envisaged in the RepowerEU plan. Ukraine has significant RES potential, which has been growing at an accelerated rate in recent years due to incentives based on the "green" tariff model. This model itself led to the emergence of a debt chain in the electricity market. Therefore, in order to stimulate the increase of RES, the government should take a number of measures to introduce the latest tools for regulating the domestic electricity market [8]. One of them is the introduction of the Guarantee of origin (GO) market. In addition, according to the EU RED II directive, Ukraine is obliged to implement a mechanism for issuing and circulating guarantees of origin for electric energy from RES, biomethane and other types of renewable gases. To this end, at the end of June 2023, the Verkhovna Rada of Ukraine adopted the Law of Ukraine "On Amendments to Certain Laws of Ukraine Regarding the Restoration and "Green" Transformation of the Energy System" No. 3220-IX dated June 30, 2023 [15], which provides for the implementation of the system confirmation of the origin of electricity from RES - the register of guarantees of origin, for the formation and maintenance of which will be the responsibility of the NCSREPU [8].

Therefore, with the introduction of the market of guarantees of origin, each RES producer will receive

guarantees for the amount of electricity they release to the network or for their own consumption. That is, each renewable energy producer will receive an asset that he can sell and thereby ensure his premium for producing «clean» electricity. However, for this market to really work, it is necessary that:

– firstly, the EU countries recognized Ukrainian guarantees. That is, in order for Ukraine to be able to export its green electricity, receiving, accordingly, a higher price for it, or to sell its guarantees abroad, it is necessary to resolve the regulatory limitation in RED II, because European countries do not recognize guarantees issued outside the EU, except for cases when The EU concluded an agreement on mutual recognition of guarantees with this third country [8];

– secondly, the government of Ukraine contributed to the creation of a favorable environment and an effective mechanism capable of providing support for RES;

– thirdly, the energy exchanges in the guarantee market ensured the free circulation of guarantees, as envisaged by the European market model. Exchange trade in guarantees, unlike bilateral trade, should be carried out according to clear rules that will help protect participants' deals and level trading risks. The same producers who will continue to work under the «green tariff» will transfer their guarantees to the Guarantee Buyer, who will ensure their trading to form a financial reserve for tariff compensation [8];

– fourthly, implementation of European standards. One of them is the Regulation on Wholesale Energy Market Integrity and Transparency (REMIT), aimed at preventing abuses in wholesale energy markets and foreseeing the responsibility of market participants for alleged manipulations [7].

Therefore, as we can see, there is no perfect recipe for mitigating the debt crisis in the electricity market. However, its reform should continue, be gradual and transparent, based on the adoption of measures that will not only temporarily solve the problems of equalizing «distortions» in financial calculations between market participants, but also ensure the complete rejection of the rudimentary mechanism of PSO and the right of consumers to freely choose the best for company and conveniently meet your electricity consumption needs.

Conclusions

Thus, we come to the conclusion that the electricity market in Ukraine cannot be considered mature and capable of a full-fledged transition to the European model of energy markets. Ideally, the Ukrainian market will move to the European model when: it completely gets rid of the regulated non-market formation of electricity tariffs - one of the

most stable vestiges of the Soviet era, which the government was never able to eliminate due to a number of socio-economic factors, and first of all, due to the inability of a significant part of the population to pay in full cost of electricity;

the block tariff for electricity with consumption thresholds will be maintained, after the last of which the market price should be applied;

consumers will be able to freely choose the best company for themselves and conveniently satisfy their needs in working with it, and suppliers will be able to compete for the consumer.

Only in this way will the Ukrainian electricity market be able to get rid of «distortions» in financial calculations between market participants, avoid debt chains and ensure the economic security of electricity producers.

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БОРГОВА КРИЗА НА РИНКУ ЕЛЕКТРОЕНЕРГІЇ: ПРИЧИНИ ВИНИКНЕННЯ ТА ЗАГРОЗИ ЕКОНОМІЧНІЙ БЕЗПЕЦІ ПІДПРИЄМСТВА ЕЛЕКТРОЕНЕРГЕТИКИ

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У статті констатовано, що однією з основних галузевих умов вступу України до Європейського Союзу є запуск повноцінного енергетичного ринку, задля чого, починаючи з 2015 року здійснено низку інституційних, економічних і регуляторних реформ. Доведено, що не дивлячись на сумлінні намагання уряду здійснити перехід до європейської моделі енергетичних ринків, Україна це так і не вдалось через велику кількість регуляторних обмежень оптових цін (price caps), невважену політику підтримки ВДЕ, відсутність ринкових цін для населення та діючі механізми покладання спеціальних обов’язків, які в сукупності й призвели до утворення на ринку електроенергії ланцюга боргів “усіх перед усіма”. Обґрунтовано, що боргова криза, яка нині спостерігається в енергетиці України, потребує на термінове вжиття заходів. Її подальше ігнорування недопустиме, оскільки створює значні загрози як для енергетичної безпеки країни, так і фінансової спроможності підприємств електроенергетики. Розглянуто утворений через модель ПСО ланцюг боргів підприємств електроенергетики. Встановлено причини виникнення боргової кризи на ринку електроенергії України, серед яких: некоректна робота механізм «покладання спеціальних обов’язків» (ПСО); суттєве недофінансування тарифів для населення, а також тарифів за надані послуги з передачі електроенергії високовольтною магістральною мережею та управління енергосистемою (диспетчеризацію); надання боржникам префе-

ренції – позбавлення їх “покарання” за несвоєчасну сплату вартості спожитих послуг. Проаналізовано запропоновані заходи з пом’якшення кризи шляхом: компенсації заборгованості коштами держбюджету; залучення кредитів державних та міжнародних банків; анулювання, встановлених НКРЕКП цінкових обмежень, так званих прайс-кепів; спрямування частини надходжень від сплати акцизного податку на погашення заборгованості, що утворилася на ринку електричної енергії; нарощування обсягів експорту ЄС «чистої» електроенергії; запровадженням ринку гарантій походження, за якого кожен виробник ВДЕ отримує гарантії, тобто актив, який зможе реалізувати, забезпечуючи у такий спосіб отримання премії за вироблену “чисту” електроенергію. Вказано на переваги та недоліки кожного із запропонованих заходів.

Ключові слова: боргова криза, борговий ланцюг «усіх перед усіма», механізм покладання спеціальних обов’язків, “перекоси” у фінансових розрахунках між учасниками ринку електроенергії.

DEBT CRISIS IN THE ELECTRICITY MARKET: CAUSES AND THREATS TO THE ECONOMIC SECURITY OF ELECTRICITY COMPANIES

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The article states that one of the main sector conditions for Ukraine’s accession to the European Union is the launch of a full-fledged energy market, for which purpose a number of institutional, economic and regulatory reforms have been implemented since 2015. It is proved that despite the government’s conscientious efforts to make a transition to the European model of energy markets, Ukraine has failed to do so due to a large number of regulatory restrictions on wholesale prices (price caps), an unbalanced policy of supporting renewable energy industry, the absence of market prices for households and the existing mechanisms for imposing special obligations, which together have led to the formation of a chain of debts “all to all” in the electricity market. It is substantiated that the debt crisis currently observed in the energy sector of Ukraine requires urgent measures. Further ignoring it is unacceptable, as it poses significant threats to both the country’s energy security and the financial viability of electricity companies. The article considers the chain of debts of electric power enterprises formed through the Public Service Obligations (PSO) model. The causes of the debt crisis in the Ukrainian electricity market are identified, including: incorrect operation of the PSO mechanism; significant underfunding of tariffs for households, as well as tariffs for electricity transmission services via the high-voltage trunk network and power system management (dispatching); granting debtors a preference – depriving them of «punishment» for late payment of the cost of consumed services. The author analyses the proposed measures to mitigate the crisis by: compensation of debts at the expense of the State budget; attraction of loans from State and international banks; cancellation of price restrictions established by the National Commission for State Regulation of Energy and Public Utilities (NCSREPU), the so-called price caps; allocation of part of the excise tax revenues to repay the debts incurred in the electricity market; increasing the volume of clean electricity exports to the EU; introduction of a market for guarantees of origin,

under which each renewable energy producer will receive guarantees, i.e. an asset that can be sold. The advantages and disadvantages of each of the proposed measures are indicated.

Keywords: debt crisis, debt chain of “all to all”, mechanism of imposing special obligations, “distortions” in financial settlements between electricity market participants.

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