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TOOLKIT FOR PROVIDING ECONOMIC AND SAFE FUTURE OF ENERGY ENTERPRISES

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The article states that the high pace of global transformational changes, the priority of reducing dependence on fuel and energy imports, the development of renewable energy sources, energy price fluctuations (caused by political instability and military confrontations), the instability of the environment for the functioning of energy enterprises and their positions. and the European energy market, the partial decommissioning of thermal power plants, the closure of mines and the reconversion of coal regions in accordance with international obligations require the search for effective tools to ensure an economically secure future of energy enterprises. It is substantiated that ignoring or not properly addressing the solution of this issue in the short term can lead to the destruction of the entire energy supply system of the country, which will have catastrophic consequences. The first steps to reform the electricity market and the results of their implementation are analyzed. New challenges to energy enterprises as a result of the full-scale invasion of the Russian Federation into the territory of Ukraine were noted. It is emphasized that a number of regulatory changes introduced by the government, designed to stabilize the industry and solve critical problems, are not effective enough and did not provide the expected results. It is substantiated that the efforts of the Ukrainian government to reform the energy sector and ensure the construction of an economically secure future of energy enterprises should be based on four key global trends - decarbonization, decentralization, digitalization and ESG-investment. Based on the data of DTEK Group's integrated reports for 2016–2021, the importance of ESG-investment in the development and economically secure future of the Group's enterprises has been proven. It is noted that it is possible to accelerate the process of ESG-investment of energy enterprises by creating a favorable investment environment. The priority vectors for the formation of the ESG-investment environment for energy enterprises are determined and the expediency of their implementation is substantiated.

Keywords: economically secure future of energy companies, decarbonization process, ESG-investment.

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Introduction and problem statement

Energy of Ukraine, as stated in the Energy Strategy of Ukraine for the period until 2035 «Security, energy efficiency, competitiveness», approved by the order of the Cabinet of Ministers dated 18.08.2017 No. 605-p [1], is an economic guarantee of state sovereignty, an element of proper governance, a reliable basis sustainable development of a competitive economy and an integral part of the European energy space [1]. The vital activity and quality of most spheres of society's life, as well as the welfare of citizens, depend on its safe and stable functioning.

It is common knowledge that the energy industry of Ukraine has significant potential for growth. However, for a long period it lacked transparent, competitive and clear rules of the game for market participants, monopolies and regulation

prevailed. This hindered the progressive development and modernization of the Ukrainian energy industry. And the system of cross-subsidization and subsidies from the budget restrained the growth of energy prices for the population, while at the same time laundering huge funds from the budget, hindering modernization and development, the introduction of new technologies at energy enterprises [2]. Therefore, the issue of finding and developing effective tools to ensure the economically safe future of energy enterprises is topical, which is what actualizes the topic of this study.

Analysis of recent research and publications

The analysis of the latest researches and publications proves that the question of ensuring the economic and safe future of the enterprises of the energy sector has not left indifferent both practitioners and scientists for a long time. In particular, in the works of such scientists as Busarev D. [3], Omelchenko V., Chekunova S., Bilyavskyi M., Khytryk T., Konechenkov A., Mishchenko M. and Dobrovolskyi D. [4], Donchenko O. [11], Gutarevich N. [13], Koshelok G., Pudycheva G. [14], Omelchenko V., Chekunova S., Bilyavskyi M. [15], Maiboroda M.M., Brych V., Liakhovych G., Barna S., Halysh N., Kliuchenko A. [16], Ereshko F., Karanina E. [17], and others, the specified problem is comprehensively considered. Instead, the high pace of global transformational changes, the priority of reducing dependence on fuel and energy imports, the development of renewable energy sources, fluctuations in the price of energy carriers (caused by political instability and military confrontations), the instability of the operating environment of energy enterprises and their positions, both in Ukrainian and the European energy market [3, p. 61], partial decommissioning of TPPs, closure of mines and conversion of coal regions in accordance with international obligations, as well as the urgent need to create favorable conditions for attracting investments in the electric power sector (in particular, to create highly maneuverable capacities, including energy storage), require the search for an effective toolkit to ensure the economically secure future of energy enterprises, and first of all, electric power enterprises [4, p. 18]. Ignoring or improperly treating this issue in the near future may lead to the destruction of the country's entire energy supply system, which will have catastrophic consequences.

Purpose of the article

The purpose of the article is to find an effective toolkit to ensure the economically secure future of energy enterprises in the medium and long-term time horizons.

Presentation of the main material of the study with a full justification of the obtained scientific results.

The basis of the state's energy system is the United Energy System of Ukraine (hereinafter - UES) – one of the largest energy associations in Europe, which includes seven regional electric energy systems (hereinafter – REES): Dnipro, Western, Crimean, Southern, South-Western, Northern and Central , which are interconnected by system-forming and main power transmission lines (LEP) of 750 kV and 330-500 kV2 [4, p. 11].

There are 413 electric power producers in the

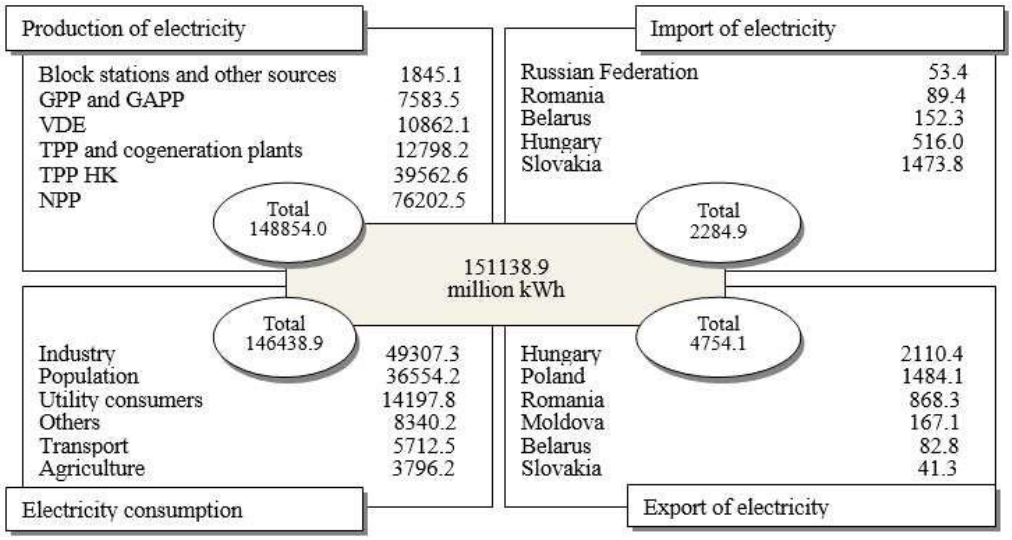

Fig. 1. Electricity balance at the end of 2020, million kWh [3, p. 32]

UES of Ukraine, of which seven are powerful power generating companies that provide about 90% of all production, 40 power transmission companies through local (local) power grids, and 147 power supply companies [5].

The mode of operation of the UES of Ukraine is determined by the balance of electricity production and consumption [4, p. 11], which, in particular, at the end of 2020 is characterized by the data presented in Fig. 1

As of December 31, 2021, the total installed capacity of power plants of the UES of Ukraine amounted to 56.2 GW, of which 49.7% is accounted for by thermal power plants (in particular, thermal power plants, block plants), 24.6% – by nuclear power plants, 11.2% – at hydroelectric power plants and hydraulic storage power plants, 14.5% – at power plants operating on renewable energy sources – WPP, SPP, BioPP (Table 1) [4, p. 74].

Table 1

The structure of the installed capacity of power stations of UES of Ukraine* [6]

Power plants	Years					
	2016	2017	2018	2019	2020	2021
GPP/GAPP	6,2	6,2	6,2	6,3	6,3	6,3
VDE	1,0	1,2	1,7	4,7	6,7	8,1
TPP	6,5	5,9	6,1	6,1	6,1	6,1
TPP HK	24,6	24,6	21,8	21,8	21,8	21,8
NPP	13,8	13,8	13,8	13,8	13,8	13,8
In total	52,1	51,7	49,6	52,7	54,7	56,2

* Excluding TNKT of Crimea, Donetsk and Luhansk regions

Based on the data in Table 1, on the one hand, the UES of Ukraine has sufficient volumes of generating capacity compared to the total load in the power system. On the other hand, the energy system of Ukraine is absolutely not flexible and is characterized by a shortage of maneuverable capacities. And this means that one of the most urgent problems facing the UES of Ukraine today, in the context of ensuring balancing in real time, is the need to significantly increase the maneuverability of the power system [4, p. 76].

The priority directions for improving the power system balancing capabilities are the opening of new highly maneuverable capacities, energy storage systems, electricity export to the EU market, and others. Instead, their implementation requires, first of all, a significant reform of the electricity market.

Understanding the existing problems in the electricity market, the government of Ukraine has already taken the first steps, in particular, to settle the issue of its liberalization. Thus, as of July 1, 2019, Law of Ukraine No. 2019-VIII «On the Electricity Market» (hereinafter – Law No. 2019-VIII) [7] completed the introduction of a liberalized market in accordance with the norms of European legislation in the field of electricity. Therefore, by analogy with European countries, wholesale and retail electricity markets have been created in Ukraine, namely: the market of bilateral contracts, the market of bilateral contracts at free prices, the «day-ahead» market (hereinafter referred to as RDN), the balancing and intraday market (hereinafter referred to as VDR), the structure of electricity sales on which is characterized by the data presented in Fig. 2.

According to Law No. 2019-VIII, three groups of suppliers are clearly defined on the electricity market (Fig. 2):

– providers of electricity at free prices who have received the appropriate license;

– universal service providers who provide supply services at economically justified, transparent and non-discriminatory prices, which are formed by them in accordance with the methodology (procedure) approved by the regulator, and include, in particular, the price of purchasing electricity on the electricity market, the price (tariff) for the services of the universal service provider, prices (tariffs) for the

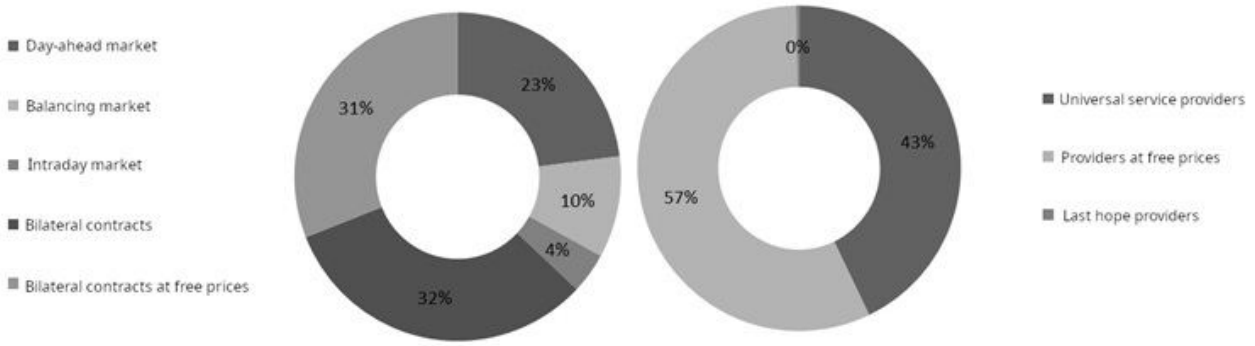

Fig. 2. The structure of electricity sales on the wholesale and retail energy market of Ukraine in 2020 [8, p. 37]

services of the transmission system operator and the distribution system operator in accordance with the concluded contracts for the provision of the relevant services. The price (tariff) for the services of universal service providers is determined based on the results of the competition to determine the universal service provider [7];

– last hope providers, who provide services for the supply of electric energy to consumers only in the case of:

1) bankruptcy, liquidation of the previous electricity supplier;

2) expiration of the license, suspension or cancellation of the license for the supply of electricity to consumers of the previous electricity supplier;

3) non-fulfillment or improper fulfillment by the electricity supplier of market rules, «day-ahead» and intraday market rules, which made it impossible to supply electricity to consumers;

4) non-selection of an electricity supplier by the consumer, in particular after termination of the contract with the previous electricity supplier;

5) in other cases provided for by the rules of the retail market.

The determination of the «last hope» supplier is carried out by decision of the Cabinet of Ministers of Ukraine based on the results of the competition held in accordance with the procedure approved by the Cabinet of Ministers of Ukraine [7].

According to fig. 2, the share of supply to consumers of electric energy at free prices for RDN and VDR in 2020 was 57%. Universal electricity supply services accounted for the rest (43%). Liberalization of the electricity market should improve the economic situation of energy companies. However, the price restrictions on RDN and VDR determined by the NCRECP led to a drop in prices (Fig. 3), which, first of all, complicated the situation of SE «Guaranteed Buyer» (Fig. 3) and led to a shortage of funds to compensate for low tariffs for the population, and also to the growth of debts to NPPs and TPPs, unprofitability of generating companies, increasing threats of their bankruptcy and outflow of investments from the industry [4, p. 16].

On the other hand, with the full-scale invasion of the Russian Federation on the territory of Ukraine, generating companies faced new challenges. Against the background of military operations in Ukraine, there was a drop in electricity consumption by 30–35% [9].

Since the beginning of the war, 35.2 million m2 of housing, more than 200 enterprises, 580 health care institutions, 562 kindergartens, more than 200 administrative and technical buildings, 27 oil depots and 12 civilian airports have been destroyed or seized on the territory of Ukraine [10]. Some industrial enterprises, which were the main consumers of electricity, stopped working. Small and medium-sized businesses either ceased their activities or were forced to relocate to the western regions. More than 6 million Ukrainians left Ukraine. All this led to a surplus of electrical energy even against the background of lost capacities. According to estimates, electricity generating companies lose over 1.3 billion hryvnias every month only due to the migration of citizens [11].

In addition, in connection with the state of war in the country, the Resolution of the CMU "On approval of the Regulation on the imposition of special duties on the operator of the transmission system to ensure the interests of the general public in the process of functioning of the electric energy market" No. 838 dated 07.22.2022 [12] extended the operation of the mechanism for ensuring public interests in the process of functioning of the electric energy market, i.e., the operation of forced price restrictions.

The practice of using this mechanism shows

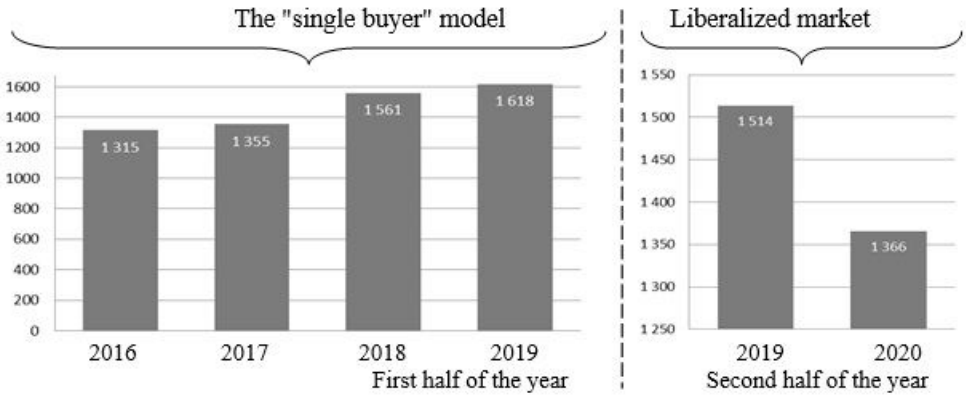

Fig. 3. Dynamics of ORC and prices on the "day-ahead" market, UAH/MWh. [8, p. 37]

that price regulation measures on the electricity market should be limited in time and gradually canceled in the post-war years, which will ensure the gradual financial recovery of generating companies.

The government of Ukraine has already introduced a number of regulatory changes designed to stabilize the industry and solve critical problems. In particular:

– extended until April 1, 2023, the obligation of producers to sell electricity under bilateral contracts exclusively at electronic auctions;

– exporters of electricity to EU member states are assigned special obligations during the martial law (Resolution No. 775 dated 07.07.2022) to pay the guaranteed buyer for the service of ensuring the security of the supply of electricity [13];

– the target direction of the funds received by the transmission system operator (hereinafter referred to as the TSO) from the distribution of the capacity of the interstate crossing has been changed, namely, the funds received by the TSO from the distribution of the capacity of the interstate crossing until January 1, 2023 must be used for the following purposes: (i) 50 % for repayment of OSP debt on the balancing market; (ii) 50% – for the repayment of the debts of the public utility under the PSO mechanism for VDE, which will contribute to the improvement of the economic security of electric power enterprises;

– VDE producers are granted the right to temporarily leave the balancing group of the guaranteed buyer. In addition, VDE producers that do not receive incentives (for example, a «green» tariff) are given the right to conclude a contract with the consumer on the provision of a service to ensure the stability of the price of electricity, which will stimulate VDE producers to work on a market basis, without state support in in the form of a «green» tariff [13].

Undoubtedly, it is not possible to find the optimal answer to every challenge, and not the first time. However, it is important to correctly define and record strategic priorities, as well as financial and economic capabilities and sources, so that the development of regulatory energy regulation is as predictable and transparent as possible for all energy market participants [13].

Taking into account the considered set of problematic issues of the electric power sector enterprises, we believe that the efforts of the Ukrainian government to reform the energy sector and tools to ensure the construction of an economically secure future of electric power sector enterprises should be based on four key global trends – decarbonization, decentralization, digitalization and, above all, ESG-investment [14], since the key problem in the electric power sector is ensuring the availability of the necessary investments.

Currently, energy companies have a unique opportunity to attract ESG-investments, thereby ensuring the economically secure future of energy companies [15]. A vivid example of this is the enterprises of the DTEK Group (Table 2).

DTEK's strategy is based on the principles of ESG (Environmental, Social, Governance) and takes into account global trends in energy and transformational changes in the economy. Its fundamental basis is guidelines and the desire to meet the interests of stakeholders, who currently expect from business responsibility for future generations not only in terms of creating material goods, but also in a valuable way.

Instead, in order to accelerate the process of ESG-investing of energy enterprises, a favorable

Table 2

Consolidated performance indicators of DTEK Group enterprises during 2016-2020, UAH million [8]

Indicators	Years				
	2016	2017	2018	2019	2020
Income	131815	134637	157619	137742	116046
Cost of goods sold	105824	100783	121273	–108570	–89890
Operating income	714	1225	571	2318	2520
Operating expenses	5752	14329	13211	–18510	–16211
EBITDA	30621	37195	42897	32768	32798
EBITDA margin, %	23	28	27	24	28
EBIT	18923	26484	28303	19129	18922
EBIT margin	14	20	18	14	16
Net profit (loss)	(1215)	4628	12373	12592	13895
Assets	140597	152492	147971	168251	180380
Capital Investments	7134	10388	19878	23180	11197
Taxes paid in Ukraine	18253	22617	26724	23394	20150

investment environment should be formed, the formation of which should begin with:

– creation of the necessary regulatory and legal field, which will ensure the attractiveness of the energy industry and the minimization of investors' risks;

– completion of integration with the ENTSO-E power system on schedule (2023), which will open opportunities for broad partnership not only in the energy market, but also in the capital markets;

– development of a culture of open innovation, robotization of production, large-scale use of modern digital technologies and AI solutions;

– construction of the Smart Grid infrastructure, which will ensure the acceleration of «green» generation, electrification and sustainable development, will become the basis for the progress of the industry and the country's economy as a whole;

– introduction of stimulating tariff formation, namely, the RAB tariff, which will allow operators of the distribution system to increase the amount of capital investment in the development of networks.

Conclusions

Thus, according to the results of the study, it was established that the high pace of global transformational changes, the priority of reducing dependence on fuel and energy imports, the development of renewable energy sources, energy price fluctuations (caused by political instability and military confrontations), the instability of the operating environment of energy enterprises and their positions , both on the Ukrainian and European energy markets, the partial decommissioning of TPPs, the closure of mines and the conversion of coal regions in accordance with international obligations require the search for effective tools to ensure the economically secure future of energy enterprises. Taking into account the considered set of problematic issues of the electric power sector enterprises, we believe that the efforts of the Ukrainian government to reform the energy sector and tools to ensure the construction of an economically secure future of electric power sector enterprises should be based on four key global trends - decarbonization, decentralization, digitalization and, above all, ESG-investment, in order to accelerate which a favorable investment environment should be created.

ESG-investing will allow not only to create an economically secure future of the energy industry, but also to implement ambitious plans for business transformation and building a new energy ecosystem of Ukraine.

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ІНСТРУМЕНТАРІЙ ЗАБЕЗПЕЧЕННЯ ЕКОНОМІЧНО-БЕЗПЕЧНОГО МАЙБУТНЬОГО ПІДПРИЄМСТВ ЕНЕРГЕТИКИ

Левченко С.А.

У статті констатовано, що високі темпи глобальних трансформаційних змін, пріоритетність зменшення залежності від імпорту палива й енергії, розвиток відновлюваних джерел енергії, коливання ціни на енергоносії (спричинені політичною нестабільністю та військовими протистояннями), нестабільність середовища функціонування підприємств енергетики та їх позицій, як на українському, так і європейському енергетичному ринку, часткове виведенням з експлуатації ТЕС, закриття шахт та проведення реконверсії вугільних регіонів відповідно до міжнародних зобов'язань вимагають на пошук дієвого інструментарію забезпечення економічно-безпеченого майбутнього підприємств енергетики. Обгрунтовано, що ігнорування або ж не належне ставлення до вирішення даного питання в найближчій перспективі може призвести до руйнування всієї системи енергозабезпечення країни, яке матиме катастрофічні наслідки. Проаналізовано перші кроки реформування ринку електричної енергії та результати їх здійснення. Наголошено на нових викликах підприємствам енергетики внаслідок повномасштабного вторгненням РФ на територію України. Акцентовано, що запроваджена урядом низка регуляторних змін, покликаних стабілізувати галузь і вирішити критичні проблеми, недостатньо дієві та не забезпечили отримання очікуваних результатів. Обгрунтовано, що зусилля уряду України з реформування енергетичного сектора та забезпечення побудови економічно-безпечного майбутнього підприємств енергетики мають грунтуватись на чотирьох ключових глобальних трендах – декарбонізації, децентралізації, цифровізації та ESG-інвестуванні. На підставі даних інтегрованих звітів Групи ДТЕК за 2016-2021 рр. доведено значимість ESG-інвестування у розвитку та економічно-безпечному майбутньому підприємств Групи. Наголошено, що прискорити процес ESG-інвестування підприємств енергетики можливо за умови створення сприятливого інвестиційного середовища. Визначено пріоритетні вектори формування сприятливого середовища ESG-інвестування підприємств енергетики та обґрунтовано доцільність їх запровадження.

Ключові слова: економічно-безпечне майбутнє підприємств енергетики, декарбонізація, децентралізація, цифровізація, ESG-інвестування.

TOOLKIT FOR PROVIDING ECONOMIC AND SAFE FUTURE OF ENERGY ENTERPRISES

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The article states that the high pace of global transformational changes, the priority of reducing dependence on fuel and energy imports, the development of renewable energy sources, energy price fluctuations (caused by political instability and military confrontations), the instability of the environment for the functioning of energy enterprises and their positions. and the European energy market, the partial decommissioning of thermal power plants, the closure of mines and the reconversion of coal regions in accordance with international obligations require the search for effective tools to ensure an economically secure future of energy enterprises. It is substantiated that ignoring or not properly addressing the solution of this issue in the short term can lead to the destruction of the entire energy supply system of the country, which will have catastrophic consequences. The first steps to reform the electricity market and the results of their implementation are analyzed. New challenges to energy enterprises as a result of the full-scale invasion of the Russian Federation into the territory of Ukraine were noted. It is emphasized that a number of regulatory changes introduced by the government, designed to stabilize the industry and solve critical problems, are not effective enough and did not provide the expected results. It is substantiated that the efforts of the Ukrainian government to reform the energy sector and ensure the construction of an economically secure future of energy enterprises should be based on four key global trends - decarbonization, decentralization, digitalization and ESG-investment. Based on the data of DTEK Group's integrated reports for 2016-2021, the importance of ESG-investment in the development and economically secure future of the Group's enterprises has been proven. It is noted that it is possible to accelerate the process of ESG-investment of energy enterprises by creating a favorable investment environment. The priority vectors for the formation of the ESG-investment environment for energy enterprises are determined and the expediency of their implementation is substantiated.

Keywords: economically secure future of energy companies, decarbonization process, ESG-investment.

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