The European Proceedings of
Social & Behavioural Sciences
EpSBS

Future Academy

ISSN: 2357-1330

https://dx.doi.org/10.15405/epsbs.2019.03.36

GCPMED 2018
International Scientific Conference "Global Challenges and Prospects of the Modern Economic Development"

OPPORTUNITIES TO FORM NEW MODELS OF ENERGY RESOURCES DEVELOPMENT IN RUSSIA

E.L. Moreva (a)*, V.N. Kruglov (b)
*Corresponding author

(a) Financial University, 49, Leningradsky Prospekt, Moscow, 125993, Russia, ELMoreva@fal.ru, eu7711460@mail.ru
(b) Kaluga Branch, Financial University, 17, Ulitsa Chizhevskogo, Kaluga, 248016, Russia, vladkaluga@yandex.ru

Abstract

The actuality of the article is the necessity to determine if it is possible for Russia to improve its energetic balance responding to the global imperatives of the kind and to consider meanwhile the current maintenance of the unfavorable version of the balance in our country. For this reason, the authors applied the general scientific research methods such as the system, process, situational, the content-analysis and other approaches, as well as the specific scientific methods such as the economic comparative instruments and others. The information basis included various statistical and other sources of the national and international organizations, the internet-resources and the special literature. The objective of the article is to argument and to reveal the concrete opportunities for out country to force the transition towards new modes of the energy production and its utilization as well as the alternative energy development. The research concluded with the real opportunities' determination of the transition towards the innovative methods of energy efficiency and alternative energy utilization despite the complicated institutional and specific climate conditions of Russia. Under these terms the perspective vector of further research is the analysis of the concrete governance mechanisms able to provide the efficient realization of such a transition

© 2019 Published by Future Academy www.FutureAcademy.org.UK

Keywords: Fintech, technology, banks, ecosystem, lending, payments.

The Author(s) 2019. This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License (https://creativecommons.org/licenses/by-nc-nd/4.0/).

https://dx.doi.org/10.15405/epsbs.2019.03.36
Corresponding Author: E.L. Moreva
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

1. Introduction

The energy efficiency' improvement is one of the main means to elevate the level of the national security (in terms of energy), the national wellbeing and the economic growth (Erokhina, 2014). It is of high relevance for Russia since only 1% of the economies of energetic resources facilitates the 0.35% of the Russian GDP increase. The energy efficiency provision efforts tend to cost three times less than the increase of the power resources production. Moreover, the energy efficiency facilitates the Budget resources to increase. By means of the power consumption economy per 1 unit of output it makes the production costs to decrease, the organizations' profitability to increase and the tax base of the economy to develop. Since many of the opportunities to elevate further the values of these indicators are due to the alternative energy resources utilization the development of the latter look to be of the high importance for the national economy and its agents as well as the very modernization and innovations in the sphere of the mere utilization of energy independently of its sources (Deetjen, Martin, Rhodes, & Webber, 2018).

2. Problem Statement

Still the real practices analysis confirms the statement of the energy efficiency and alternative energies attractiveness is to be complemented with some additional terms to be correct.

Thus, the contemporary analysis of the energy sources structure of Russia proves the conservation of its archaic version. The latter looks to stimulate the efforts to transform it for the more efficient one. Still the attempts realized result not to be so efficient (Cretan, Molchanova, & Klochkov, 2013).

The very execution of such new projects and the facilities to make use of their products are of both positive and negative character. Here is one of the typical cases of the latter.

In frame of the general vector to modernize the urban lighting the Russian regional center Orel substituted the last two years its 11607 bulbs for the led lamps. Still after the changes realized in more than 800 streets of the city it became all dark and provoke a pronounced increase of the number of accidents.

The reasons of such impacts of the initiative which initially looked to be quite attractive were due to the faults of the organization and timely control over the project. The respective Technical Modernization Plan of the lightening was elaborated without its decent coordination with the specialized entities in charge of the lightening, neither with their approval of it nor with the acceptance of the operations. The disincentive effect was for the negligence of the basic governance and management principles, i.e. the decent organization, the strict control execution and the system approach application. The authorities were to consider not only the mere goal of the energy economies maximization as it is but the relationship of the respective operations with the other spheres of the environment in terms of the living standards quality and its level especially. Otherwise the energy economy principle may translate in the negative consequences exactly as were in the case of the city of Orel, 2017 (Peredil's'ke, 2017).

If not for such defaults the effects of the transformation could be quite positive such as those of ECO Stream™ dissemination.

The product was elaborated by the "Ultra – K" group of companies in Kaluga region which is among of the leaders of the energy economies development equipment. Its novel high quality' equipment

https://dx.doi.org/10.15405/epsbs.2019.03.36
Corresponding Author: E.L. Moreva
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

of ECO Stream™ is characterized by a large variability of the layout and the multiple opportunities there to install the modern peripheral interfaces.

The technology elaborated in the enterprise is unique further to its characteristics of the heat transmission, strength, corrosion resistance and the durability of operation. It is of high efficiency in the economic sense as well since it decreases the compactness of the equipment and its metal consumption 1,5 – 2 times than its foreign analogues with the costs to be some 30-40% less than these. Moreover, the manufacturing quality of the Russian equipment is also better than the foreign one.

Nowadays the thermal equipment of the company is used successfully in such projects as “Dostupnoye zhilye” (Accessible housing,), «Reforma ZhKKh» (The housing maintenance services reform) as well as in frame of the import substitution program to reconstruct and provide the housing, industrial and administrative housing with the high quality equipment made in Russia (Ulyanova, 2017).

The products of the company figure in the List of the Innovative High Quality Goods and Technologies and among those which are used under the Russian Federation State Program “Energy economies and the energy efficiency elevation for the period up to 2020”.

The case mentioned is far from unique if to judge after the published sectoral statistics. The data of the Ministry of energy of Russian Federation of 2017 inform the installation of 1400 individual heat points in the buildings of Sankt Petersburg and Kazan’ to facilitate the population annual economies of up to 400 mln. Rbls. The substitution of some 44% of the total of the urban lamps for the led ones in the city of Vladimir has resulted already with the economies of the energy resources of more than one third. In Moscow the introduction of the energy efficient technologies provided the 40% improvement of the street lightening intensity with the same amount of resources used.

Another perspective innovative source of resource mobilization is the alternative energy which facilitates the utilization of the so called “natural” potential or the potential of the «secondary processing». The first one refers to the solar and/or wind energy utilization while the second one refers to the energy from waste incineration, for example. Compared with the traditional (“conservative”) energetics the alternative one is of much more perspectives due to its economic effect which triggers its development practically as per different countries practice.

The Russian Federation is not the exclusion. Annually there are tens of projects developed directed to be in the sphere of alternative types of energy utilization. Still the efficiency of such a “brain storm” is not so high. Its reasons are of complex nature.

Here is the case of one of the typical start-up projects with a good potential to contribute to reverse the energy balance. In 2016, A. Navasardyan with K. Spiridonov, the entrepreneurs from Russia, developed the innovative equipment to transform the solar energy in the electric one. It was quite compact and efficient constituted by the solar panels and the block of convertor and accumulator which operation was monitored by the soft designed for the smartphones. Just at the beginning of the tests of the project the daily production of alternative energy of such equipment proved to be at 16 kWh per hour which was quite good value. The accumulator capacity facilitated the energy reserves for 24 hours and the project looked to be quite successful until the commercialization stage.

https://dx.doi.org/10.15405/epsbs.2019.03.36
Corresponding Author: E.L. Moreva
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

The Russian market showed little if not to say no interest for the project with no actual investors to facilitate the organization and arrangement of its production. And the project' trajectory was to follow the destiny of many other projects

The case is quite notorious to understand the reasons of the archaic sources of energy structure in contemporary Russia conservation. Nowadays the rate of the solar ones in the total stucture with its traditional production modes included is much less than 0,05% (i.e. 100 megawatt, in absolute terms only) (Unified energy system of Russia, 2017).

Still even these separate solar installations are used to be in the productive sector mostly. The problem of their introduction in the housing sector is not raised.

3. Research Questions

Thus to identify the nature of the problems of the energy usage emancipation of Russia and the respective vectors of the further efforts the research should focus the comparative situation in some other economy benevolent for such a transformation.

With the identification of the main terms to advance the energy efficiency and its sources structure the factors identified are to be compared with the Russian ones thus to deduct the main directions for the conditions to transform the actual situation.

4. Purpose of the Study

The purpose of this paper is to argument the complex transformation of the national environment to provide the progressive changes of the energy efficiency and the energy sources structure in Russia.

5. Research Methods

To meet the purpose formulated the economic structural and comparative analysis as well as the content analysis and the case studies methods were focused mainly to be applied to the data and other information of different national contents.

In difference from Russia the state and the regulators of the American environment facilitated the efficient realization of the project of Russian entrepreneurs in the housing sector of America. The installation created proved to be two times cheaper than their American analogues to decrease the market price level of the product to 8 thousand USD. Also, it resulted to be more secure and of better quality with all its elements installed within the houses but not outside them. Equipment installation time decreased almost 30 times (de Paulo & Porto, 2018; Roddis, Carver, Dallimer, Norman, & Ziv, 2018; Sivaram, Dabiri, & Hart, 2018).

Which were the main factors benevolent for the energy efficient technology introduction in the USA?

The system of the factors to impact the general tendencies to provide the large scale- solar energy utilization

The practices of solar energy utilization tend to become more and more popular in the USA supported by the state.

https://dx.doi.org/10.15405/epsbs.2019.03.36
Corresponding Author: E.L. Moreva
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

In the housing sector the solar batteries are applied more actively in the southern states. In 2015 only more than 1 mln. Solar batteries were installed in the roofs of the houses. The Mistry of Energy plans to increase the number of such installation to become 4 mln. Units by the year of 2020.

The tendency is supported with the efficient institutional models. Thus, in California and some other places the specialized companies install the equipment gratefully later to compensate their costs with the funds received for maintenance and supply of electricity. The service contracts are up to 25 years long.

Besides, recently the American productive sector tends to pass to the solar energy as well. The last 2 years annual of its production was more than its Russian total during the last 20 years. In 2 months of 2016 only, the USA put in operation the solar energy production carriers of more than 4 GW that is some 46 MW per day.

Historical factors

The USA has accumulated a good experience to support the development and the introduction of the alternative sources of energy. Even in the 70s of the last century there were some special programs of the kind. These were, for example, the GreenPricin program to mobilize funds for the further investments in the renewable sourced. Or it was the Netmetering program to provide savings on payment of electricity when using alternative sources. These programs founded the basis for the new ones to consolidate the tendency for the alternative energy utilization and to develop it further.

Institutional factors

Many of the private producers of such new installations provide trade credits with 0 interest rate or various leasing programs. These are largely promoted by different stimulus of the state.

Thus, American producers in charge of alternative energy may claim various tax deductions. These tend to be provided in 2 modes. The one is when they may get the production tax credits by means of which to decrease the corporate tax to the amount of the alternative energy production. The other is the investment tax credit to decrease the taxation to the amount of the capital investments in the sector.

Nowadays practically in all states there are systems of the kind. Reasonably the alternative energetics is actively developing in the private sector (Zhou, Wang, Zhou, Clarke, & Edmonds, 2018). Now there are more than ten thousand companies in it.

Consequently, the solar energy prices tended decreasing almost twice with the respective diminishment in the only 2017 of 16%.

The American experience proves the actual opportunities for the transition to the alternative energetics and for their analysis to make use of some of these in Russia (Majumdar & Pasqualetti, 2018; Rashidi, Kashefi & Hormozi, 2018; Shahsavari & Akbari, 2018). Still one needs to consider the specific features of the country while the appraisal.

The objective obstacles for the development of the solar energetics in Russia.

Firstly, one is to consider the limited number of the solar days in Russia compared with USA which means the pronounced decrease of the efficiency coefficient of solar energy use.

One can’t change it radically but can make it effects to be less pronounced by means of the consideration of the similar conditions in some of the regions in the southern part of Russia.

https://dx.doi.org/10.15405/epsbs.2019.03.36
Corresponding Author: E.L. Moreva
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

Today the electrical energy tariffs in Russian Federation tend increasing but still are keeping much smaller than in majority of developed countries (Vozdvizhenskaya, 2017). In impacts traditionally the attitudes of consumers, the population incl., towards the energy resources. In Russia, for example, the share of the population which treat them economically is about 5 - 10% against 95% in Scandinavian countries.

One should take different measures to change the situation. Among them is the gradual price increase by means of the diminishment of the cross subsidizing practiced until now and the reduction of the of non-targeted benefits. Instead these are to be applied specially to those who practice more energetic resource economies to promote the energy economies' technologies development.

The market and financial factors.

Moreover, the opportunities for the Russian transitions towards the alternative energies are difficulted by the general state of the energy' market which keeps very centralized, limits the entrance of the new private companies and impedes the competition advancement. Respectively it is important to complement and to develop the measures of the State to stimulate the development of the renewable energy sources and to consider the complex means to solve the problem of high monopolization not limited these by the frames of the sector only (Resolution of the Government of the Russian Federation, 2013).

Last but not least, the other important factor to limit the transition is the high price of the borrowings. After the experts' calculations and considering the average level of the returns of the installed capacity of 18% and the general tendency of the decrease of the amounts of the capital investment for the solar energy generation to 50 thousand Rbs. per 1kW the financing of such projects with 5% annually is able to provide the return of the investments and the income of the Investor with the price of the 1 kW-hour of 2,6 Rbl (Krasilnikova, 2017).

6. Findings

The above application of the scientific research methods facilitated the identification of a system of factors to serve to be the objects of a purposeful influence to provide the efficient changes of the energy usage in Russia.

Of these the most prominent are the following:

- the institutional factors;
- the cultural factors;
- the market factors;
- the financial factors.

Still these factors transformation in Russia is not to copy strictly the American variant since there are some other terms to be considered if such changes take place. These factors refer to the group of those of the objective character:

- the geographic one,
- the climate one,
- the historic one,
- partly the cultural one.

https://dx.doi.org/10.15405/epsbs.2019.03.36
Corresponding Author: E.L. Moreva
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

The combination of these groups proves the necessity one to be cautious while the transformations realization considering the actual limitations just to copy the American practices but to consider them as a particular opportunity to be applied in some benevolent context local (geographical, cultural etc.), functional (financial, institutional, etc.) or of some other character.

7. Conclusion

All above mentioned proves the actual opportunities in Russia to provide the alternative energetics development, to improve the energy balance of the country and to elevate the productivity of the economy. But its' condition, however, is the adoption of a special set of measures.

Further to the energy sector as it is the measures still can't be limited to the very sector only but should be applied to its consumers, be they the entrepreneurs or not, and to their infrastructure.

Such a broad scope, in turn, make one to analyze the suitability of these measures, the governance provision tools used by the state nowadays. In spite of their analysis to overcome the frame of the current article still it would facilitate the efficient development of the conclusions deducted, reveal the modes to realize the aforementioned opportunities and determine the mechanisms to realize such a transition in practice.

References

Cretan, S., Molchanova, E., & Klochkov, V. (2013). The modeling of innovation processes in the regions. In P. Nizhegorodtsev (Ed.), *Regional innovation systems: analysis and forecasting: proceedings of the sixteenth Kucerovsky readings* (pp. 214-218). Novocherkassk, Russia: YURGTU [in Rus.].

de Paulo, A., & Porto, G. (2018). Evolution of collaborative networks of solar energy applied technologies. *Journal of Cleaner Production, 204,* 310-320. https://dx.doi.org/10.1016/j.jclepro.2018.08.344

Deetjen, T., Martin, H., Rhodes, J., & Webber, M. (2018). Modeling the optimal mix and location of wind and solar with transmission and carbon pricing considerations. *Renewable Energy*, *120*, 35-50. https://dx.doi.org/10.1016/j.renene.2017.12.059

Erokhina, E. (2014). *Regional innovation subsystems: problems of formation and development*. Kaluga: Your House.

Krasilnikova, O. (2017). Startup for export. *Kaluga Business Journal – Kaluga Region, 1-2*(105), 32-35. URL:http://pressa-online.com/tabid/140/Default.aspx?aid=6f0c52dc-4ea1-4285-9cb4-b3eeeefa4822&iid=204244&stage=2&year=2017

Majumdar, D., & Pasqualetti, M.J. (2018). Analysis of land availability for utility-scale power plants and assessment of solar photovoltaic development in the state of Arizona, USA. *Renewable Energy*. https://dx.doi.org/10.1016/j.renene.2018.08.064. URL: https://www.researchgate.net/publication/327331733_Analysis_of_land_availability_for_utility-scale_power_plants_and_assessment_of_solar_photovoltaic_development_in_the_state_of_Arizona_USA

Peredil's'ke, D. (2017). Darkened Orel. *Russian Newspaper*, *7444*(278). URL: https://rg.ru/2017/12/07/reg-cfo/orel-pogruzilsia-v-polumrak-posle-modernizacii-osveshcheniia.html [in Rus.].

Rashidi, S., Kashefi, M., & Hormozi, F. (2018). Potential applications of inserts in solar thermal energy systems – A review to identify the gaps and frontier challenges. *Solar Energy*, *171*, 929-952. https://dx.doi.org/10.1016/j.solener.2018.07.017

Resolution of the Government of the Russian Federation (2013). "About the mechanism of stimulation of using renewables in the wholesale market of electric energy and power". № 449, from 28.05.2013. URL: http://base.garant.ru/70388616/. [in Rus.].

Roddis, P., Carver, S., Dallimer, M., Norman, P., & Ziv, G. (2018). The role of community acceptance in planning outcomes for onshore wind and solar farms: An energy justice analysis. *Applied Energy*, *226*, 353-364. https://dx.doi.org/10.1016/j.apenergy.2018.05.087

Shahsavari, A., & Akbari, M. (2018). Potential of solar energy in developing countries for reducing energy-related emissions. *Renewable and Sustainable Energy Reviews*, 90, 275-291. https://dx.doi.org/10.1016/j.rser.2018.03.065

Sivaram, V., Dabiri, J., & Hart, D.M. (2018). The need for continued innovation in solar, wind, and energy storage. *Joule*, *2*, 1-4. https://dx.doi.org/10.1016/j.joule.2018.07.025

Ulyanova, N. (2017). Incubation period. *Kaluga Business Journal – Kagula region*, *3*(106), 40-42. URL: http://pressa-online.com/tabid/140/Default.aspx?aid=6f0c52dc-4ea1-4285-9cb4-b3eeeefa4822&iid=204244&stage=2&year=2017. [in Rus.].

Unified energy system of Russia (2017). URL: http://so-ups.ru/?id=962. [in Rus.].

Vozdvizhenskaya, A. (2017). For energy-efficient homes want to encourage. *Russian Newspaper*, *7444*(278). URL: https://rg.ru/2017/12/07/minenergo-predlozhilo-lgoty-domam-s-vysokoj-energoeffektivnostiu.html [in Rus.].

Zhou, S., Wang, Y., Zhou, Y., Clarke, L., & Edmonds, J. (2018). Roles of wind and solar energy in China's power sector: implications of intermittency constraints. *Applied Energy*, *213(*1), 22-30. https://dx.doi.org/10.1016/j.apenergy.2018.01.025.