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The environmental legal narrative of renewable energy sources: legal regulation in the Russian Federation and Canada

© 2025. E. S. Koshcheeva[1] ORCID: 0000-0003-0272-7759, M. A. Smirnov[1, 2] ORCID: 0000-0002-2876-1974,
[1]Volgo-Vyatka Institute (branch)
of the Kutafin Moscow State Law University (MSAL),
30, Moskovskaya St., Kirov, Russia, 610000,
[2]Vyatka State University,
36, Moskovskaya St., Kirov, Russia, 610000,
e-mail: koscheeva@yandex.ru, vkkop@yandex.ru

The article is analyses normative-legal regulation and public policy system of the renewable energy sources (RES) in the Russian Federation and Canada. The authors analyzed the normative-legal base of RES formation, generation and effect on the development of domestic and foreign policy of the states. An attempt is made to describe and compare environmental and legal approaches to the application and realization of RES and their impact on the development of the Russian Federation and Canada. The article analyzes "green" energy on the basis of state approaches and natural-geographical conditions of the territory of the states at its formation. In the Russian Federation the main RES sectors are solar energy, wind energy, hydropower, energy obtained from biomass and waste processing, biogas, and landfill gas. In Canada, the main clean energy sectors are more province-specific and additionally include geothermal energy, green hydrogen and territorial tidal phenomena. The RES analysis will help to identify the specifics and opportunities for application and formation of new mechanisms of state policy and improvement of the regulatory framework in the Russian Federation. The main difference between the Canadian and Russian approach to legislative regulation is the two-tier regulation: the general directions of sustainable development and the four-year strategy are fixed at the federal level, while the main legislative regulation is carried out at the provincial level, depending on regional priorities in the development of certain RES types. The experience of Canada's "distributed" regulatory framework can be used to improve Russian legislation, as it will help to take into account regional priorities in the development of certain RES types and implement short-term renewable energy projects.

Keywords: renewable energy sources, environmental safety, normative regulation, public policy (public administration).

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Эколого-правовой нарратив возобновляемых источников энергии: правовое регулирование в Российской Федерации и Канаде

© 2025. Е. С. Кощеева[1], к. ю. н., зав. кафедрой,
М. А. Смирнов[1, 2], к. и. н., доцент,
[1]Волго-Вятский институт (филиал) Московского государственного юридического университета имени О. Е. Кутафина (МГЮА),
610000, Россия, г. Киров, ул. Московская, д. 30,
[2]Вятский государственный университет,
610000, Россия, г. Киров, ул. Московская, д. 36,
e-mail: koscheeva@yandex.ru, vkkop@yandex.ru

Статья посвящена анализу нормативно-правового регулирования в области возобновляемых источников энергии (ВИЭ) в Российской Федерации и Канаде. Проанализирована нормативно-правовая база становления, генерации и влияния ВИЭ на развитие внутренней и внешней политики государств. Сделана попытка описания и сравнения эколого-правовых подходов к применению и реализации ВИЭ и их влияния на развитие Российской Федерации и Канады. В статье даётся анализ «зелёной» энергетики, исходя из государственных подходов и естественно-географических условий расположения территории государств при её образовании. В Российской Федерации основными секторами ВИЭ являются энергия солнца, энергия ветра, гидроэнергетика, энергия, получаемая при переработке биомассы и отходов, биогаз, газ, выделяемый отходами на свалках. В Канаде основные секторы «зелёной энергетики» более чётко привязаны к провинциям и дополнительно включают геотермальную энергию,

зелёный водород и территориальные явления природы в виде приливов и отливов. Проведённый анализ ВИЭ поможет конкретизировать особенности и выявить возможности для применения и формирования новых механизмов государственной политики для совершенствования нормативно-правовой базы в Российской Федерации. Главные отличия канадского от российского подхода в законодательном регулировании состоит в двухуровневом регулировании: общие направления устойчивого развития и стратегия на четыре года закрепляются на уровне федерации, а основное законодательное регулирование осуществляется на уровне провинций в зависимости от региональных приоритетов в развитии отдельных видов ВИЭ. Опыт «распределённого» нормативного регулирования Канады может быть воспринят для совершенствования законодательства России, поскольку поможет учесть региональные приоритеты в развитии отдельных видов ВИЭ и реализовать краткосрочные проекты в сфере возобновляемой энергетики.

Ключевые слова: возобновляемые источники энергии, экологическая безопасность, нормативное регулирование, государственная политика (государственное управление).

Representatives of the international community, experts, and scientists consider renewable energy sources (RES) as an obligatory element aimed at solving global problems and a trigger for the transition to sustainable development of mankind in the XXI century [1].

At the One Planet Summit in France on January 11, 2021, United Nations Secretary-General Ant nio Guterres focused on building a global coalition to achieve carbon neutrality. The European Union, Great Britain, Japan, South Korea, Canada and more than 110 other countries have pledged to become carbon neutral by 2050, and China by 2060. These countries account for 65% of all harmful emissions and 70% of global GDP [2]. The United Nations sees "making peace with nature" as one of its priorities. A global climate emergency and five key targets: carbon neutrality by 2050; reducing global emissions by 45% by 2030; adapting to climate change; meeting financial commitments; and implementing "transformative strategies", including phasing out coal and ending fossil fuel subsidies, are an unconditional priority for humanity [3].

At present in Russian Federation (RF), solar and wind energy has the greatest technical potential, while small hydro resources, low-potential heat and geothermal energy have the "maximum recovery rate". The Energy Strategy of the RF for the period until 2035 was approved by the Russian Government Order No. 1523-r dated 9 June 2020 (hereinafter – the Energy Strategy). Its main provisions note that nuclear power, hydropower and other RES account for a third of the country's total energy production in the RF fuel and energy complex. The above determines RF's place among the world's largest economies as one of the most environmentally friendly (low-carbon) fuel and energy balances.

In Canada, RES are presented in the form of interrelated areas characterized by high environmental efficiency, and the algorithms of implementation are prescribed in various legal sources, including the Federal Sustainable Development Act (FSDA) and the Federal Sustainable Development Strategy (FSDS). Canada effectively utilizes RES, which, in turn, affect domestic policy and development of provinces and territories. According to [4], renewable energy intensive technologies constitute about 17% of total energy supply and have a share of 65% of total electricity production in Canada.

For the progressive and environmentally safe development of any territory, it is important to analyze the best practices of RES legal regulation. The analysis of RES development in the territories of the RF and Canada is correlated by similar natural-geographical location and relatively identical natural and climatic conditions, as well as territorial structure. The environmental and legal narrative of RES in the RF and Canada is of great interest for the development of green energy [5].

The main aim is to describe and analyze the experience of renewable energy environmental and legal regulation and public policy, case study of the Russian Federation and Canada.

Objects and methods of research

The object of the study is public relations in renewable energy development of the RF and Canada, arising in the process of development and implementation of state policy measures, which are regulated by normative acts, including program documents of strategic planning of both states. The subject of the study is a set of legal norms in renewable energy development in the RF and Canada.

In this study, a comparative legal analysis was carried out to identify common patterns and differences in the RES state regulation. We used the Russian reference legal systems Consultant-Plus and Garant, as well as search engines of Google scholar, Social Science Research Network, Scopus, Web of science. The period from 1998 to the present was covered. Search and

specification of information in legal reference systems was carried out through the following functions: legal navigator, reference information, search card, search by all documents, advanced search using additional parameters, search by document content, search by document number and date, as well as search by period. When using search engines and international databases of publications, keywords were used: renewable energy sources, RES, environmental safety, environmental law, public environmental policy, Federal Sustainable Development Strategy for Canada, Hydrogen and Bioenergy Strategy, Ontario, Quebec.

Results and Discussion

Overview of the Russian Federation legislative regulation in renewable energy sources utilization. Article 3 of Federal Law "On Electric Power Industry" No. 35-FZ dated 26.06.2003 defines the RES list. Additional normative regulation is established depending on the respective source and energy sector. It should be noted that the "RES" category is legislatively fixed by enumerating sources but not on the basis of a set of attributes.

In the author's opinion [6], this approach is based on the existence of developed standards in the energy sector and insufficient development in the energy law doctrine. Thus, the development of solar energy in Russia is at the initial stage. In particular, at the end of 2019, solar power plants generated 2.8% of the total global electricity production [7]. At the same time, at the beginning of 2020, solar and wind generation in Russia together accounted for 0.2% of electricity production [8]. The bulk of the power plants are commissioned in 2019–2020, currently involving about 50 companies that supply equipment and carry out installation [7]. The main trend in solar energy development is microgeneration, i.e. the installation of solar panels by private entities for household consumption. In this regard, the main regulatory act was the Federal Law "On Amendments to the Federal Law "On Electric Power Industry" in terms of microgeneration development" No. 471-FZ of 27.12.2019, which actually became applicable from 2021 due to the adoption of the relevant decree of the RF Government [8].

With regard to wind energy as a RES, it is also worth noting the actual absence of its role in the energy balance of the country, and the Russian market is not included in the list of leading wind energy markets [9]. In the structure of the power plants capacity of the Unified Energy System of the RF (UES) wind energy occupies 0.79%, according to the data for the beginning of 2022 [9]. In the structure of electricity generation (electricity export) in the UES the share of wind power plants for the same period amounted to 0.32% [10]. For comparison, in the world electricity generation in 2021 wind power accounted for 6.6%, according to the Global Electricity Review report [10]. Regulatory control is carried out within general legislative acts; there is no special regulation [7].

Hydropower provides almost 19% of electricity generation in Russia [11]. At present strategic documents assume a slight decrease in the growth rate of the industry up to 2035. The list of regulations governing the considered sphere is very wide: from the RF Water Code to standards of hydraulic structures using.

Geothermal energy is the second most common RES in Russia, but accounts for less than 1% of total energy production. The most accessible geothermal potential is concentrated in Kamchatka and the Kuril Islands. Legal regulation is carried out within federal legislation in the electricity sector.

Bioenergy in Russia is widespread in the heat supply sector, it is carried out on the basis of federal regulation by general normative acts.

Thus, special normative regulation of certain RES is not typical for Russia, it is carried out on the basis of federal legislation in energy.

Based on the literal interpretation of Article 3 of the Federal Law "On Electric Power Industry" the RES list is closed. This fact is noted in the scientific literature in the context of criticism [12], there are also explicit proposals for its expansion [13].

At the same time, the above legislative approach is explained by the availability of appropriate financial support for the renewable energy. In fact it is a question of applying to the relevant facility the legal regime of an energy generating facility using RES [12].

The fundamental normative acts in the sphere of RES utilization are subordinate normative acts, which determine the directions of the state policy in the sphere of increasing the energy efficiency of the electric power industry on the basis of RES up to 2035; the regime of generating facilities operating on the RES utilization; the procedure for their certification [14].

They also include a number of strategic planning program documents [15] in prospective development of the electric power industry [16]; as well as the procedure for their development [17].

Thus, the main direction of normative regulation in RES utilization is the establishment of the legal regime of generating facilities, which determines the possibility of state financial support.

A review of Canada's renewable energy legislation. The development of RES in Canada is an urgent agenda, both in the context of achieving carbon neutrality and for "energy self-sufficiency" [18].

Legislative regulation of RES varies across Canada: provinces and territories have very broad powers under Canadian law. The federal government legislates for RES enterprises when they are located on public land plots, as well as in cases of international energy supply.

Since RES regulation is largely adopted at the provincial level, there is no universal definition of "renewable energy" or "green energy" in Canada. However, renewable energy is generally defined as energy derived from sources such as water, wind, solar, geothermal, biomass, biogas, green hydrogen, ocean or tides. For example, British Columbia legislates these types of energy sources. In other provinces, such as Alberto and Ontario, renewable energy is defined more generally as an energy source that occurs naturally or can be replenished naturally, and includes specifically defined renewable energy sources similar to those listed above [18].

Hydroelectricity is the predominant renewable energy form used in Canada, accounts for 60% of all electricity generation [19]. Opportunities to develop different types of renewable energy vary depending on geography, climate and existing infrastructure of each province. Some provinces are more suitable to certain types of renewable energy. For example, a significant portion of the energy market in British Columbia (B. C.), Manitoba and Quebec is hydroelectric. Alberta, Nova Scotia and Ontario are attractive for wind power projects. The solar market is developing in Alberta, Ontario and Saskatchewan. Hydrogen is one RES whose use will increase in Canada. In December 2020, the Government of Canada released the Canadian Hydrogen Strategy, which identified hydrogen as a strategic priority for Canada over the next 30 years.

The Federal Sustainable Development Act has become the main regulatory act in RES at the federal level; in accordance with the above, Canadian government is obliged to develop the Federal Sustainable Development Strategy (FSDS) [20]. It sets the main directions of development for the period from 2022 to 2026.

Since the main RES legislative regulation in Canada is carried out at the provincial level, we will analyze the main regulations of major Canadian provinces.

In 2020 Alberta's Recovery Plan [21] and Natural Gas Vision and Strategy [22] articulated the goal of making clean hydrogen part of Alberta's energy production. In 2021, Alberta released its Hydrogen Roadmap [23]. Alberta is currently the Canadian largest producer of hydrogen, which is mostly produced from natural gas, and is not classified as "renewable". Nevertheless, Alberta plans to transition to clean hydrogen production. Alberta's capacity to produce clean hydrogen is projected to be about 45 million tons per year. However, it is worth noting that there is a critical approach in the literature regarding the compliance of this RES with the green agenda [24]. In August 2022, the province of Alberta finalized the regulatory framework for geothermal energy with the release of Directive 089: Geothermal Resource Development and the Geothermal Resource Development Rules.

In July 2021, the B. C.'s government released its Hydrogen Strategy, which outlines the province's priorities for increasing clean hydrogen production [25]. Since over 98% of B.C.'s electricity is carbon-free and generated from renewable sources, the province intends to use its clean electricity to produce green hydrogen through electrolysis. There are currently 40 hydrogen projects under development in B. C., including water as a renewable energy source [26].

In April 2022, the province of Ontario released the Low-Carbon Hydrogen Strategy [27] as part of its Made-in-Ontario Environment Plan [28]. The Plan identifies eight immediate actions to advance the hydrogen economy, including a hydrogen pilot project in Niagara Falls.

The Quebec government's 2030 Plan for a Green Economy [29] highlights green hydrogen and bioenergy as additional sources of clean energy for Quebec's green economy future. In July 2022, Quebec published its 2030 Green Hydrogen and Bioenergy Strategy [30]. In addition, in the renewable energy sector, Quebec has adopted a number of regulations, including the Qu bec Energy Transition, Innovation and Efficiency Master Plan [31].

On June 21, 2022, the Government of Canada published the final version of the Clean Fuel Regulations (CFR) (SOR/2022-140), which replace the current federal Renewable Fuel Regulations. The CFRs require major suppliers (fuel producers or importers) to reduce the carbon intensity of liquid fuels produced, used or imported into

Canada. New regulations are being introduced based on life-cycle carbon intensity, as well as on greenhouse gas emissions measurement. These regulations are intended for low-carbon fuel investments and new low-carbon technologies in Canada.

Based on the above, a number of interim conclusions can be formulated:

1) at the federal level, the main regulatory framework for renewable energy is the FSDA, which is the basis for the approval of the FSDS;

2) the main regulatory framework for renewable energy in Canada is at the provincial level, depending on the regional priority for the development of individual renewable energy sources.

The main renewable energy goal is to have 90% by 2030 and in the long term, 100% of Canada's electricity produced from renewable sources [32].

The implementation strategy for achieving this indicator includes a set of measures.

First of all, implementation and enforcement of regulations and legislation: by 2024, it is planned to adopt RES regulations on the continental shelf within the framework of the Offshore RES Regulation Initiative [33] (tidal energy, wind power).

The second direction is the creation of a new generation grid system: by 2023, complete 22 projects involving next generation smart grid technologies and/or the deployment of integrated smart grid systems.

The third direction is to install RES in indigenous and northern communities: by 2026, install up to 40 megawatts of RES in rural and remote communities and off-grid industrial facilities.Access to efficient sources of electricity is also planned: by 31 March 2026, 11 settlements will have access to more efficient sources of electricity as a result of infrastructure investments under Canada's Arctic Energy Infrastructure Fund.

The fifth direction of the Strategy is support for smart RES: by 2026, the Strategy plans to support new 1 000 megawatt RES projects capable of providing essential grid services.

The federal government is primarily committed to achieving green energy targets, planning to achieve full utilization of green electricity in federal ownership by 2025, including the production or purchase of electricity from renewable sources. Annex 3 to the FSDS 2022–2026 identifies the responsible ministries and departments for achieving the indicators [20].

Accordingly, we can draw conclusions based on the above. This trend is reflected in the FSDA transformation: from 2021, the FSDA included environmental, economic and social aspects in the agenda of the federal sustainable development concept and expanded the number of organizations involved to 101. The targets of the FSDS 2022–2026 are directly linked to the targets of the 2030 Sustainable Development Goals.

Conclusion

The RES environmental-legal narrative of the RF and Canada presents complex mechanisms of state management based on the formed legal framework and regular timely adjustment of the sources of law, which is specified by the following features.

1. The RF and Canada are countries with similar geographical and natural-climatic conditions, as well as the presence of abundant natural resources. These features integrate energy efficiency into the energy independence and sustainable development strategy of both countries.

2. The main directions of long-term strategic planning of Russia and Canada in the renewable energy sector are to maximize integration into the global climate agenda in order to achieve the 2030 Sustainable Development Goals defined by the United Nations and to preserve energy security and sovereignty of both countries.

3. It is important to build a general system of sources of law regulating public relations on the RES issue. In the RF and Canada there is a system of normative-legal base of regulation, which includes laws and subordinate normative-legal acts. Laws define the main provisions of regulation, to which further strategies are developed with the possibility of prompt response and flexibility to changing conditions and novelties of the state policy, especially in terms of scientific and technological development.

4. Regulatory and legal regulation of RES in Canada is presented in the form of greater autonomy of provinces and territories, the so-called "decentralized policy". This peculiarity is related to their territorial location, natural and climatic conditions, and differences in the possibilities of utilizing the natural forces of the hydrosphere, lithosphere and atmosphere. The FSDS, adopted in fulfillment of the FSDA for a three-year period, are the main documents of long-term strategic planning. Their provisions also apply to the RES sector. Based on the FSDA, each agency develops and implements its own local sustainable development strategy. This principle can be applied in Russia in general

and in all 89 constituent entities of the Russian Federation in particular. The main measure to support RES consumers can be borrowed "green tariffs" for energy from renewable sources.

5. RES development has a significant impact on positive changes in the sustainable development of states, in particular on social, economic and environmental aspects. RES contributes to the socio-economic development of states, aims to support and implement the main domestic policy programs, e.g. education, social functions of the state, innovation, national projects, etc.

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