

ANALYSIS OF THE BUSINESS ENVIRONMENT IN THE ENERGY SECTOR OF KYRGYZSTAN



Photo: Vlad Ushakov



BizExpert

Research • Analysis • Solutions

Bishkek

December 2020

ACKNOWLEDGEMENTS

The report was developed by the BizExpert Analytical Centre's experts with the assistance of ACTED within the framework of the project "Promoting Energy Efficiency and Renewable Energy Production in the Community-Based Tourism Sector in Central Asia":



Department of Tourism under the
Ministry of Culture, Information
and Tourism of the Kyrgyz
Republic

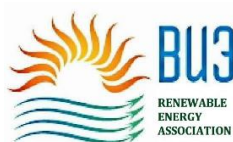


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Association of
Microfinance Institutions
(AMFO)

Appreciation is expressed to Kenzhematova Kyjal Abdimalovna, Deputy Director of the Tourism Department under the Ministry of Culture, Information and Tourism of the Kyrgyz Republic for his/her advices on the actual needs of the tourism sector in developing small-scale alternative energy; to representatives of the RES Association of the Kyrgyz Republic for their advice on clarifying the delineation of electricity, heat and biogas suppliers; to representatives of the "JIA" business association; to partners from the private sector for their involvement in the analysis and assessment of the sectors' problems.



Renewable Energy
Association of
Kyrgyz Republic



LLC New-Tek



NurSun
Energy



CJSC "Incraft"



JIA Association



LLC ES
Technology



Stinscom KG



LLC JAC KG

Special thanks to the programme of the European Union, «SWITCH Asia» for the financial support. Please visit www.switch-asia.eu for more information on the project.

FOREWORD

About the Project

The project "Promoting Energy Efficiency and Renewable Energy Production in the Community-Based Tourism Sector in Central Asia," funded by the European Union under the «SWITCH Asia» programme, aims to reduce the carbon footprint of the tourism sector in Kyrgyzstan, Uzbekistan, and Tajikistan by creating an enabling environment for increased energy efficiency (EE) and strengthened sustainable consumption and production of renewable energy (RE) by Micro, Small, and Medium Enterprise (MSME) in the community-based tourism sector.

This study will serve as an analytical basis for the development of a roadmap and policy measures to enhance the production and consumption of RE, as well as the overall uptake of EE in the tourism sector and the reduction of emissions. BizExpert developed a report on the outcomes of the energy sector analysis for publication and presented it to a wide range of stakeholders, including private sector actors, the general public, government officials, decision makers, and development partners. The purpose of publishing and presenting the report and analysis is to engage parties in a national and regional discourse, where they can discuss the findings of the sector's economic challenges and analyse the impact of the policies undertaken.

The main objective of the first phase of the project *to promote increased renewable energy production and consumption as well as energy efficiency in the community-based tourism (CBT) sector* is to assess the current business environment and to inform the public about the findings of the small-scale energy sector analysis.

The report includes background and analytical information on the current situation of the energy sector. It presents the methodology of the study, the findings of an economic analysis of growth and development of RES-based clean energy production, the use of EE, an assessment of the legal business environment and identifies gaps in the policies implemented.

The Inter-Ministerial Working Group will initiate the development of a policy document (Roadmap) based on the study's findings and the results of the discussions.

This document has been prepared with the financial support of the European Union. The contents of these documents are the sole responsibility of the BizExpert and can, in no circumstances, be regarded as reflecting the position of the European Union. The distribution and use of this Report is welcomed with mandatory reference to the source, with full intellectual property rights over all publications of the project belonging to the European Union, while partial reuse of material imposes liability on the user in case of distortion of the primary meanings and texts.

LIST OF ABBREVIATIONS AND TERMS

CBT entities	Individuals, legal entities, citizens engaged in economic activities, providing tourism services in local areas, using their property, in order to generate entrepreneurial income (hereinafter community based tourism)
CHP	Combined heat and power plant
CO ₂	Carbon monoxide/carbon dioxide leaves a carbon footprint and is part of greenhouse gases, chemical formula CO ₂
CONSUMERS	Private entrepreneurs in the community-based tourism sector with the intention of using technologies, equipment, resources for clean energy based on renewable energy and applying technologies and materials for energy efficient consumption of resources are
DECENTRALISATION DISTRIBUTED ENERGY	Type of sectoral policy aimed at developing small-scale energy Model for the operation of a unified energy system which, allows small-scale energy entities to supply produced energy to distribution companies
EAEU	Eurasian Economic Union
ECONOMIES OF SCALE	Economic results expressed in a reduction in the cost of production due to increased (consolidation of) production and sales
EE	Energy efficiency, the rational, economical use of resources and energy, allowing the required need to be met at the lowest possible cost
EEC	Eurasian Economic Commission (supranational body)
EFFICIENCY	Coefficient of performance
ENERGY AUDIT	Type of specialized activity to provide expert-consulting services and external evaluation of energy efficiency
ENERGY EFFICIENCY	Rational use (consumption) of energy resources while maintaining the quality of tourism services and maintaining (improving) the level of comfort in compliance with the necessary standards, regulations
ENERGY INTENSITY	Actual consumption (use) of energy and fuel for the maintenance and operation of tourism facilities and infrastructure in the provision of tourism services
ENGINEERING SERVICES	Professional services that provide technical support for individual activities from the design and construction phase through to the operation of the facility
EU	European Union
EXTERNAL ENVIRONMENTAL FACTORS	Factors that directly and indirectly affect the firm, the industry (economic factors determining the policies of the industry's economy, political factors, legislative and legal rules, technological factors and patterns).
FGD	Focus group discussion, a form of stakeholder dialogue involving experts
FINANCIAL INSTITUTIONS	Financial and credit sector organizations concerned, hereinafter referred to as FCS
GARTEK	State Agency for Regulation of the Fuel and Energy Complex under the Government
GKPEN	State Committee for Industry, Energy and Subsoil Use of the Kyrgyz Republic
HOUSEHOLDS	Form of economic activity for the use of property complex, uniting people by labor relations, the smallest and most massive unit of the national economy, a quite independent subject of market relations.
HPP	Hydroelectric power plant

INTERVENTION	Managerial and regulatory action by the state that changes the legal relations of the parties in order to achieve certain goals
JSC/AO	Joint stock company
kV	kilovolt unit of voltage measurement
kWh	kilowatt-hour is the unit of measure of the amount of energy produced or consumed
LOCAL RENEWABLE ENERGY SYSTEMS	Autonomous complexes of energy generation, transmission, storage and consumption
LSG	Local self-government bodies
MICRO-GENERATION	Production (generation) of electricity, heat by very small capacity facilities. (According to the WADE classification, small or microgeneration is the production of electricity at or near the place of consumption, regardless of size, technology or fuel - either off-grid or in parallel with the grid).
MSME/MSMB	Micro, small, medium enterprise or business
MW	Megawatt, a unit of power measurement
NLAs	Normative legal acts
NSC	National Statistics Committee
OECD	Organization for Economic Cooperation and Development
PROGRAMMING	Activity of public authorities aimed at setting priorities, coordinating the implementation of economic policies subordinate to development objectives through planning
FACTORS OF PRODUCTION	Economic resources used or consumed to produce goods, works, services
RES	Renewable energy sources used to generate (produce) clean energy
RIA	Analysis of the regulatory impact of regulations on the activities of business entities
SHPP	Small hydroelectric power plant
SMALL-SCALE ENERGY	Segment of the energy (market) sector comprising small-scale generation plants and small-scale generation complexes, including those not connected to the centralized electricity grid, operating on traditional fuels and on renewable energy sources (RES)
STATE REGULATION	Reasonable establishment of rights and obligations, requirements and conditions for the conduct of certain business activities
SUPPLIERS	Firms, companies, organizations, individual entrepreneurs (hereinafter Entities) producers of goods, works, services
THE ENERGY INTENSITY OF AN ECONOMY	Value for assessing the energy efficiency of a sector (ecosystem), a national economy. thermal conductivity
THE NATIONAL ENERGY HOLDING	Open joint stock company with a 100% state share, having subsidiary JSC energy companies with a dominant state share
TOURISM FACILITIES	Buildings, structures and engineering infrastructure
TOURISM INFRASTRUCTURE FACILITIES	Engineering support systems that consume energy resources and generate, transmit and store energy
TOURISM SERVICES	Activities of an entrepreneur aimed at generating income and profit by meeting the needs of the tourist (citizen)

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INTRODUCTION

The majority of Kyrgyzstan's population lives in rural and remote mountainous areas with limited access to infrastructure, as well as considerable deterioration of energy equipment, utility networks, and a lack of capacity, resulting in occasional power outages. Citizens develop and manage enterprises to provide tourism services in such circumstances. Citizens unite based on economic interests in order to provide a set of tourism services at the community level, but due to objective circumstances, they must use hydrocarbons for heating, hot water, food preparation, as well as the processing of agricultural products and handicrafts in their economic activities and household and agricultural management.

According to the information provided by "TASS" with reference to the "BBC" study by University of Sydney scientists has revealed that global tourism accounts for 8% of all carbon dioxide emissions into the atmosphere (transportation (transportation of tourists, luggage and, cargo) accounts for over 5%, the rest comes from tourism infrastructure, tourist services and catering facilities)¹. The usage of modern household equipment (electric kettles, microwave ovens, electric ovens, electric cookers, heaters, hot-water boilers, underfloor heating, etc.) is increasing, as is the percentage of electricity in the structure of fuel and energy consumption. Household appliances (TV sets, washing machines, air conditioners, computers, refrigerators, hoovers, etc.), mini equipment (electric separators, feed mills, pumps, dryers, etc.) and power tools (welding machines, sewing machines, drills and other power tools) stimulates the growth of the electric energy consumption. Therefore, response to the growing consumption is to increase the capacity of existing HPP, CHP plants through equipment modernization and energy conservation and to build new hydro power plants, including small ones. For many years the construction of a CHP in the north near the Kara-Keche coalfield has been discussed, which contradicts the emission reduction goals. Today, consumption outstrips generation and the gap is filled by electricity imports. The share of renewable energy production in the country's final energy consumption is less than 2% and is provided by SHPPs. There are no other official data on renewable energy production.

There is no objective reliable data available that reflects the energy efficiency of tourism properties, the type and energy efficiency class of equipment, appliances, and devices utilized, or an accurate estimate of energy saving at the community level. The overall energy efficiency of residential buildings is very low, as shown by the fact that 48% of the country's electricity production is used for heating. This estimated high consumption confirms the high-energy consumption for heating in single-family houses of more than 350 kWh per meter of floor area, which is 3 to 4 times



¹ TASS Information Agency: <https://tass.ru/obschestvo/5186931>

higher than in technologically developed countries. This high consumption is due to the use of construction and finishing materials and technologies with high thermal conductivity, the low efficiency of the heating systems used, the practical absence of automatic control systems and the use of buildings and structures with high heat loss (over 50%). Improvement of the situation is linked to solving the problems of switching to new management methods and applying other technologies, which requires large one-off investments and a sufficiently high level of awareness of energy efficiency and economic benefits.

The tariff policy for irrational electricity consumption for heating does not impact on the growth of energy efficiency. During the AWP period, the average tariff charged was 1 KGS/kWh for households, with a progressive charge applied when consumption exceeded 700 kWh per month (except for population, highlands and other areas), and 2.2 KGS/kWh for economic entities. Public attitude towards tariff policy is predetermined by politicisation of this issue, the inertia of the energy sector management system, based on redistribution of tariff burden on economic entities, under pressure of population to reduce energy costs due to low economic situation of citizens. Therefore, the advantages of using electricity for business and domestic activities remain, and hydropower still has a competitive advantage over other types and sources of energy. The development of RES -based microgeneration in the CBT sector has nothing to do with alternative supply, alternative supply systems for tourism facilities and tourist services, or the abandonment of traditional energy resources. It is important to note that in fact there is no data on the cost of energy generated (microgeneration) from RES, except for calculations of the cost and price of energy from SHPPs and some individual cases of biogas production. During the review of CBT tourist services, it became apparent that a number of tourism services are requested solely because of the idea of self-generated heat, radiant energy from burning solid fuels (firewood, organic, charcoal, coal, organic fuel of animal origin) in the hearth and open fire sources (campfires, braziers, tandoor). There is no widespread application of EE and RES technologies, biogas production in the tourism sector. Minor usage of RES, EE is observed only by private sector entities representing medium and large businesses in the tourism sector in order to reduce the use of traditional energy sources or to provide emergency electricity supply options. The most widespread are technologies for converting solar energy into thermal energy (water heating) and electric energy for emergency lighting systems. Typically, financial institutions do not provide specific (green) financing for CBT subjects.

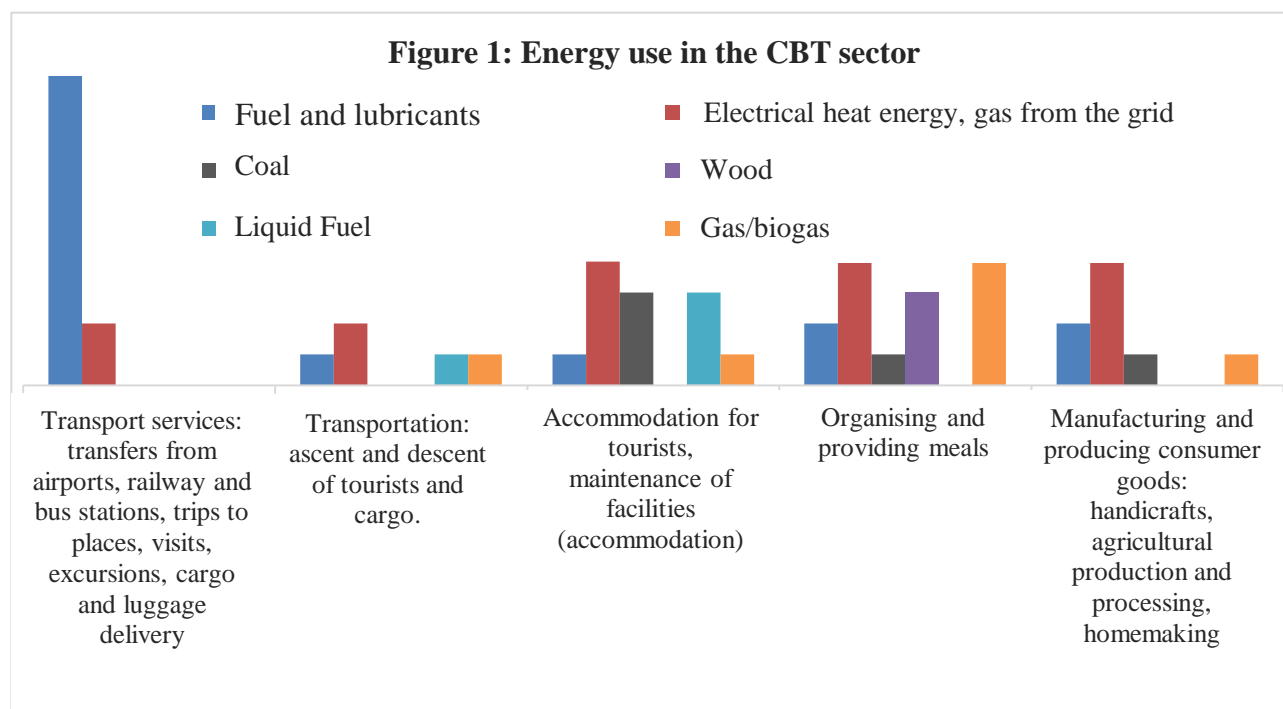
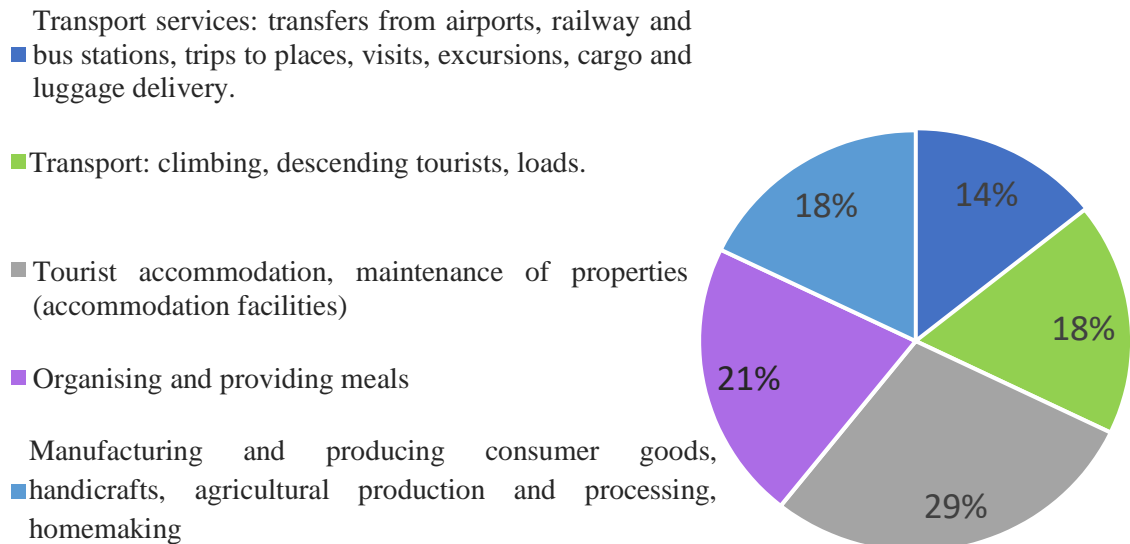


Figure 2: Types of tourism services



The survey identified the main tourism services that require energy and fuels. The growth potential of renewable energy sources and the economic situation of MSMEs, the energy sector and nature itself depend on the development of local autonomous systems. Technological development already allows for the use of microgeneration of electricity, thermal energy, biogas production, solar energy and thermal waters. The use of renewable energy technologies for energy generation and EE growth for many business entities is the only possible way to solve the problems of energy supply for tourism facilities and the provision of quality services at CBT level.

METHODOLOGY, AIMS AND OBJECTIVES

1. The practical theoretical and methodological basis of the study consists of publications of domestic researchers, data on RES development issues, EE in relation to tourism energy supply and the provision of community-based tourism services.
2. The analysis employed the approach of economic evaluation of the major inputs of production (economic resources required) and clean energy usage.
3. The method of multi-factor analysis of the influence of external environment factors was applied, in particular the method of assessment of the impact of norms and regulations of legislation on certain types of entrepreneurial, investment activities, analysis of actual impact of implemented policies on growth and development of three fields of activity (small, alternative energy sector, "RES, EE suppliers", "Consumers" community-based tourism sector).
4. Statistical and mathematical method of data processing, as well as the method of expert assessments of the business environment have been applied to determine the level of potential and state of the energy sector and small (alternative) energy based on RES, the use of technologies, EE materials.
5. Based on a preliminary expert assessment and in line with the aims and objectives of the analysis conducted, problem identification methods based on desk review and sociological research (surveys and questionnaires), and a focus group discussion involving stakeholders were used on the issues and problems under investigation.
6. Desk research - involved the study and analysis of the adopted sectoral policy documents, on the development of the energy sector and the development of RES, EE suppliers, Consumers (community-based tourism sector), and experts, identified the correlation of goals and objectives of energy sector development and sustainable tourism, laid down in the country development strategy until 2040.
7. An expert analysis has been carried out on the consistency of the objectives of the implemented policies (strategies, programmes) for the development of the energy sector and the activities of "Suppliers" and "Consumers" with the objectives of reducing the negative impact on the environment and minimising emissions in the community-based tourism sector.
8. The analysis and study of the legal framework and other documents regulating certain business activities and regulating the use of renewable energy and the application of energy-saving technologies has made it possible to systematize areas of legislation for discussion and identification of problems.

The proposed systematization of the forms of state regulation of homogeneous business activities allowed us to systematize the areas of regulatory legislation (substantive branches of law, business law), identify the main problems arising from regulatory practices, which in turn allowed us to assess the impact on the development of activities of three groups ("Consumers", "Suppliers" EE growth, clean energy production and consumption.
9. In order to adjust expert opinions on the state of the business environment and to evaluate policies, analyses and reports from other organizations that address the development of the RE Suppliers sector have been reviewed.
10. In order to distinguish the environmental problems (market problems) an economic analysis of the production factors (basic economic resources necessary for clean energy production based on RES and application of EE technologies and materials), for the growth and development of small, alternative energy at CBT level was carried out. Based on the desk analysis, a list of topics to be discussed and problems to be clarified was developed and preliminary questionnaires were prepared, taking into account industry specifics.

11. **Quantitative measurement and basic research factorology.** In line with the aims and objectives of the research enquiry, a preliminary questionnaire survey was carried out on a base of previously selected private sector actors Suppliers, Consumers and FCS. The questionnaires were designed with the necessary questions for the analysis and preparation of the FGD in mind and the respondents were given access to the documents to be analyzed (programmes, policies, NLAs).

12. Qualitative research indicators. A focus group discussion, online surveys and questionnaires of FGD participants were conducted in order to identify the actual impact of the adopted policy documents, assess the impact of the NLAs on the growth and development of the Supplier, and Consumers sectors, identify problems with the use of basic economic resources and further study the status and characteristics of the sectors, identify cause-effect relationships. Based on the analysis of the composition of the participants, an additional questionnaire survey of the tourism sector actors was conducted.

13. Sampling for activity analysis. Based on the analysis of the lists of market participants, the results of the questionnaire, the survey and the FGD, no specialized group of interests in the use of geothermal resources and the supply of necessary equipment, technology is identified. General sampling allows identifying private sector representatives by interest groups, homogeneity of activities and range of problems, as well as identifying systemic problems of implemented policies. The Head of the Department of Tourism has been consulted to study the actual need of the tourism sector for alternative small-scale energy development.

14. Consultations were held with representatives of RES association in order to clarify the problems of differentiation of electricity, heat and biogas suppliers, consultations were held. In its work with stakeholders, the expert group was guided by the RIA methodology, in the methodology of developing strategic, policy documents for problem identification, scoping assessment, with direct involvement of stakeholders, discussions, expert consultations.

15. Processing and reflection of data and indicators, informing. The results of the survey of respondents, and FGD participants, were processed with the help of software, the survey was conducted using digital platforms <https://foquz.ru/> and the main service used was <https://oproso.ru>, allowing for quantitative counting of participants and automatic processing of quantitative data of answers to the questions. Tables and charts software, provides for automatic calculation and determination of percentages in the form of a comparison with the index to the sum of 100% of the ratio of the whole sector or all representatives of the homogeneous activity to the problem, question, answer.

16. The expert method of constructing a Problem Tree was used to identify root causes - barriers to growth and development, to identify the nature of the origin of sectoral problems (institutional market problems and environmental civil and economic relations), and to identify regulatory problems arising from the policies implemented, the legal and regulatory relations (legislation).

Keywords: small energy, microgeneration, local renewable energy systems, energy efficiency, energy conservation, energy intensity, thermal conductivity, tourism infrastructure facilities (buildings, system facilities), decentralization, small energy, renewable energy, distributed energy, economies of scale, community-based tourism, households, economic resources, environmental factors, programming, government regulation, energy audits, engineering services.

A typology of economic and regulatory barriers:

- Failure of policy;
- Regulatory failures;
- Institutional barrier, including the underdevelopment of market institutions;
- A financial, credit, investment barrier;
- The economic barrier to the availability of basic economic resources;

- Market barriers;
- Sectoral governance and monopolism.

The sector analysis and assessment for 2020 has some limitations: there are virtually no statistical data and indicators available at the local community level that reflect the status of the MSME sector, sectoral small-scale energy and self-generation (microgeneration) and RES-based energy consumption and the status of energy efficiency of real estate, engineering systems and services in the tourism sector. The analysis of quantitative data determining the relevance of the issues addressed, the topics discussed, and the confirmation/disproval of expert hypotheses is supported by qualitative environmental assessment data. In cases where a clear difference or neglect of the issue by respondents and FGD participants is identified, the topic is excluded from further analysis as low sensitivity and not relevant.

The methodology involves the use of a scoring system to identify sensitivity in data assessment and analysis, with the highest values being analyzed and the lowest values indicating a negative impact or equating to low sensitivity. $1 > 0$; a value equal to or close to 50% is considered sensitive and a value close to 100% is critical. The results of the questionnaire provide data but do not allow us to extrapolate to the whole country, nevertheless the results allow us to identify trends and confirm the validity of expert approaches in identifying sector problems and policy gaps.

The main objective of the first phase of the work is to prepare a list of problems arising from the economic environment, the legal and regulatory framework and the implementation of policies covering cross-sectoral issues. The policies analyzed in this study covers the last three years and reflect the current situation of the energy sector and business environment, which is one of the objectives of the first phase. In order to obtain a factual assessment of the impact of the policies implemented, key stakeholders were involved to participate in the discussion, questionnaires, surveys: private actors "Suppliers of RES, EE technologies and materials market", actors of the financial and credit sector, actors of the tourism sector, quantitative and qualitative indicators of the composition of FGD participants, survey respondents, and individual private actors involved as stakeholders. In total, 59 person took part in the focus group discussion.

The Suppliers group was represented by:

- importers of equipment and components - 5;
- equipment manufacturers - 4;
- developers and planners - 2;
- production-generation, clean energy supply - 5;
- service and maintenance organizations - 2.

The "Consumers" group (representatives of the tourism sector) were represented by 8 person.

The finance and credit sector group were represented by 8 person.

Representatives of the education sector was represented by 7 people;

Industry experts and specialists was represented by 9 people;

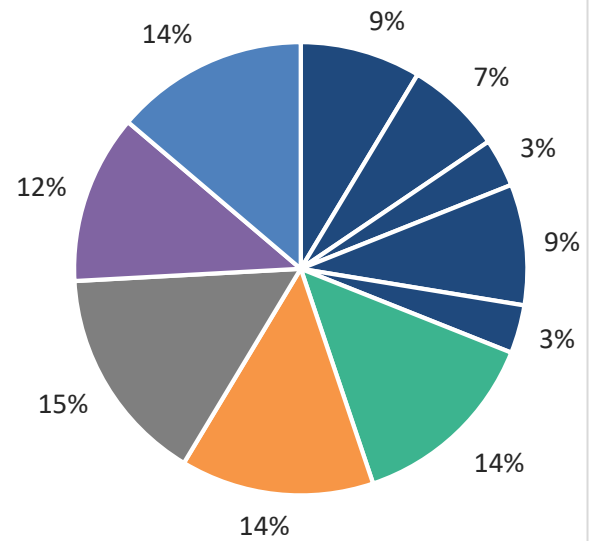
6 other participants;

The JIA Association, RE Association of KR and the AMFO Association took part.

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Figure 3: Quantitative-qualitative indicators of the composition of participants in the focus group discussion

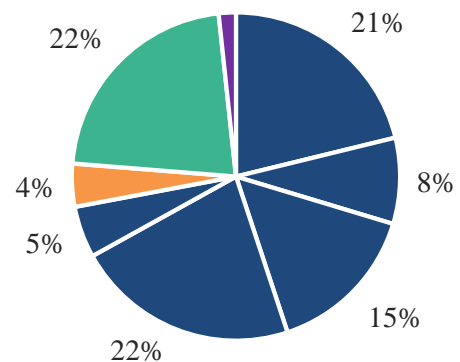
- Importers of equipment and components
- Equipment manufacturers
- Developers and designers
- Production-generation, clean energy supply
- Service and maintenance organizations
- Tourism industry
- Financial institutions
- Organizers and Exhibitors
- Education
- Industry experts and specialists



A total of 86 respondents took part in the preliminary questionnaire.

Figure 4: Quantitative and qualitative indicators of the composition of the questionnaire respondents

- Import/export (supply and sale) of finished goods, equipment, devices, appliances, components, RES/EE technologies
- Production of finished goods (equipment, devices, devices, components for RE/EE)
- Development of energy-saving technologies, use of RES to generate clean energy
- Works and services (installation, adjustment, construction (service), repair, 2% engineering, training, consulting)
- Production-generation, supply of clean energy
- Finance and credit sector
- Tourism
- Education



ASSESSMENT OF THE BUSINESS ENVIRONMENT IN THE ENERGY SECTOR, ANALYSING THE DEVELOPMENT OF RENEWABLE ENERGY PRODUCTION AND THE USE OF RENEWABLE ENERGY TECHNOLOGIES

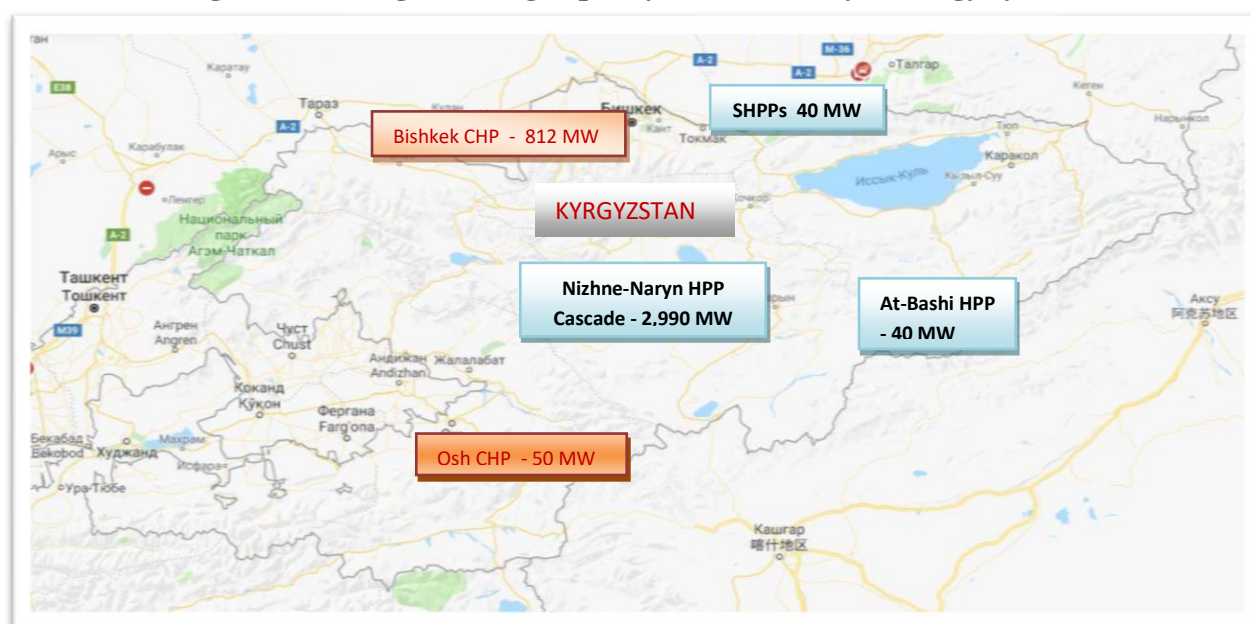
State of the Energy Sector and Impact of Policies on Renewable Energy Production and EE Growth

The Central Asian region is characterized by the presence of hydrocarbon reserves, and Tajikistan and Kyrgyzstan have hydropower potential. The peculiarity of the use of hydro-energy resources for energy generation is the uneven location of large production facilities and the location of hydrocarbon deposits on the territory of Kyrgyzstan far away from major consumers. The structure and regularities of national energy development in the system of planned socialist economy were based on the dominating role of the state, which could unite all necessary economic resources (production factors) for creation of centralized energy system in Central Asia. This predetermined the development policies of the sector for many years, as natural monopolists and economies of scale emerged.

Today, the ratio of productive forces (basic means of production and means of energy transmission) predetermines the economic relations in the energy sector. The core of the energy system consists of large HPPs - 3,030 MW, 2 CHPs - 862 MW and several SHPPs - 40 MW. The hydropower potential of Kyrgyzstan's small rivers and the possibility of building about 100 SHPPs on them could provide a capacity of 175 MW. The use of this potential is limited for a number of reasons, primarily the lack of economic and technical capacity. From the materials of the project of UNECE "National Sustainable Energy Action Plan of the Kyrgyz Republic" prepared by Sh. Dikambaev (Bishkek, 2019), an assessment of hydropower resources and renewable energy resources is given and the statement is made that: *«Hydropower has a greater economic potential than all other renewable energy sources combined»*.

A similar conclusion is drawn from a contribution bfrom the Kyrgyz branch of Hydropower LLC²

Figure 5: Main generating capacity of the country's energy system.



² <https://www.hydroenergetica.kg/hydroenergetica-kyrgyzstana>

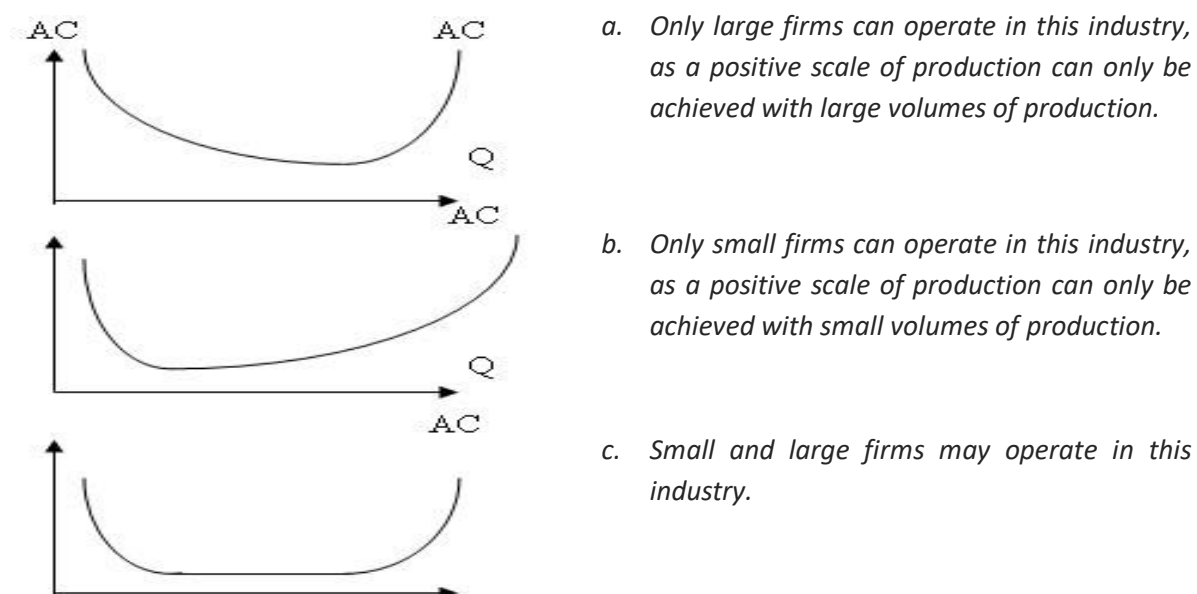
A small share of private generation plants and transmission lines and systems are not state-owned, but are part of a single system.

A characteristic feature of the Kyrgyz energy sector is the fact that all entities producing and transmitting energy have by definition a private legal form of Joint Stock Company (JSC), but the share of state ownership is 80%, with the exception of small unitary enterprises in the form of municipal enterprises, which are fully owned by the state.

The main hydropower plants (hereinafter referred to as HPPs) are located in the south of the country, while the main consumption takes place in the north of the country. The installed capacity of the power plants in the south of the country is 2,920 MW or 79.4% of the total installed capacity of the country. Two large thermal power plants are located in Bishkek and Osh and are fueled by coal, gas, and ferrous oil products, which leads to pollution.

According to GKPE 2020, there is a low usage of water and energy resources, with a total estimated potential of 142.5 billion kWh, of which only 10% is expected to be developed. A private company "Kyrgyz branch of Hydropower LLC" estimates that the overall capacity of promising small rivers and streams is 1.6 million kWh, with an annual output of 5-8 billion kWh. At the same time, the uneven location of HPP generating capacities leads to the cost of transporting energy over long distances and, consequently, to technical losses, while the resource of generating and transmitting stations, systems and devices and lines is physically worn out. The inefficient use of natural hydro resources has been compensated by the economies of scale of large energy producers, which are subsidized and regulated by the state, while the marginal growth in the volume of generated energy has stopped.

Figure 6: Dependencies on economies of scale

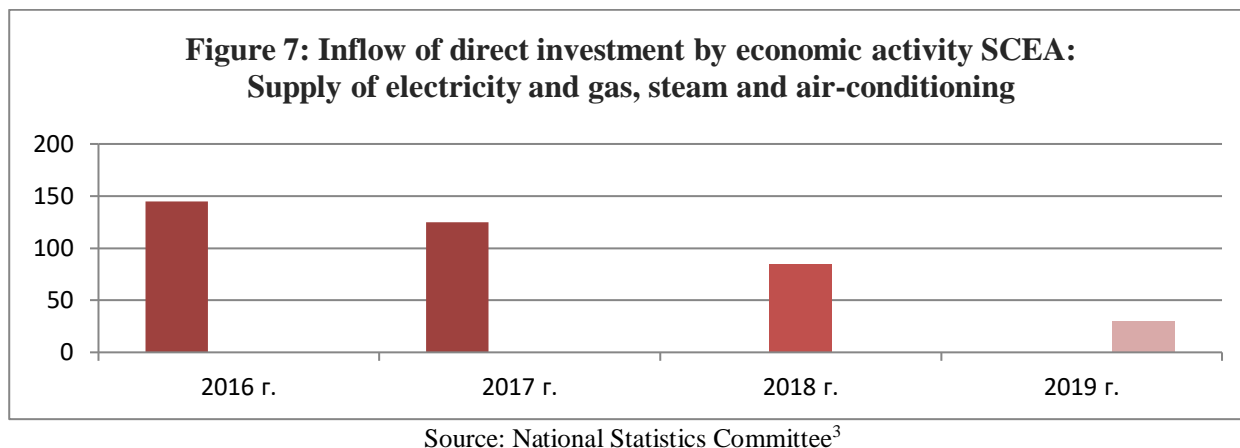


Indeed, it can be argued that the positive economies of scale have been achieved and that a negative phase of economies of scale is underway, defined by increased expenditures to maintain production volumes and increased energy costs in the face of the imposed retention. Due to the need to increase capacity in the context of scarce financial resources, the government is forced to implement policies to reduce electricity consumption and take other measures to modernize existing production facilities and increase the energy efficiency of the energy production and consuming sectors. The country's development strategy until 2040, under the heading "Energy", sets the goal of becoming a major producer of electricity in the region, ensuring sustainable energy development, energy efficiency of the real sector of the economy and ensuring affordability for the consumer. The implementation of the regional CASA-1000 project will enable the

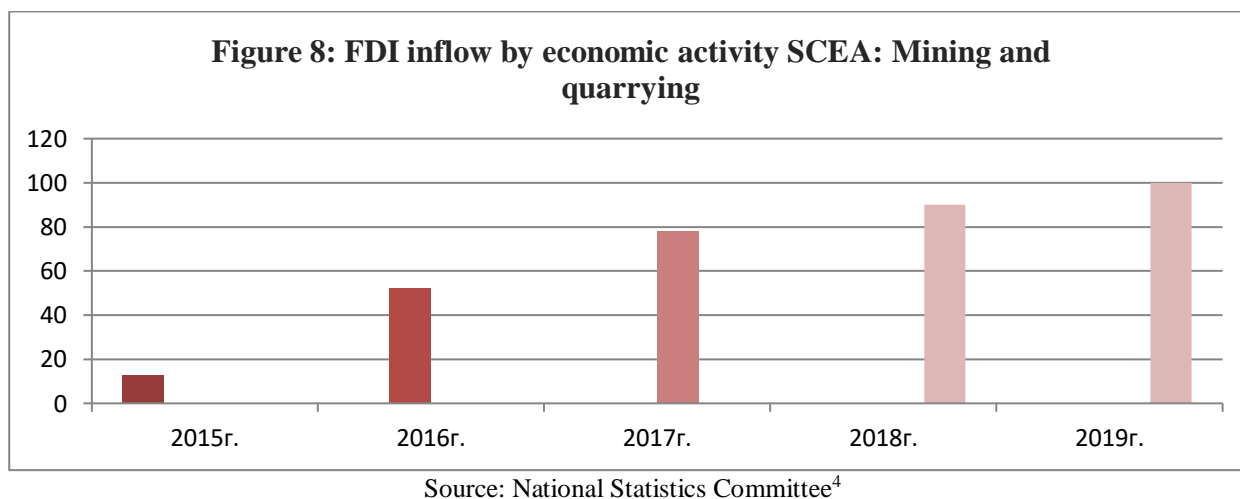
development of electricity exports in the region. However, this requires surplus capacity and the necessary resources to build new large and small HPPs.

Investment and Realistic Achievement of Strategic Development Goals

According to statistical data, there is a downward trend in investments in the energy sector. In 2015, USD 136,704 was invested, while only USD 10,595 in 2019. Figure 7, clearly demonstrates the reduction in investments by economic activity of the SCEA (supply of electricity and gas, steam and air-conditioned air).



At the same time, according to the NSC (Figure 8), foreign direct investment by SCEA type are increasing, including in coal mining.



The irrationality of the use of water-energy and other RES and EE resources is firstly related to the general technological backwardness, secondly to the lack of favorable economic conditions and entrepreneurial practices-skills for independent activity with obvious deficit of personnel, information and finances, as well as the negative impact of external influences on private initiative MSME entities. The natural monopoly of energy producers from traditional resources (hydro, gas, coal, mazut) is reinforced by the regulatory role of the state, which on one hand shows the absence of market relations, on the other hand the consistently monopolistic low energy tariffs are a boon for the consumer.

³ www.stat.kg/ru/opendata/category/1763/

⁴ www.stat.kg/ru/opendata/category/1763/

Inertia in Public Administration and "Monopoly Thinking"

The established unified energy system continues to be a strategic industry and the legislation entities are classified as natural monopolies. The managerial approaches of the 1960s-70s, dominated by technocentrism and total unification in addition to economies of scale, and the current to develop the energy sector are based on the understanding that an energy centralized distribution system needs to be developed. The centralization of the distribution system and the concentration of production on one hand allows solving the problems of the sector, but on the other hand, this approach is in contradiction with the economic interests of autonomous producers and other market players. The rules of the game are subordinated to the interests of sector development, where only large and medium-sized players can operate. The paradox of managerial approaches is that, in the absence of private enterprise and investment initiative, increasing consumption - and in some areas, energy shortages - policies are formed based on development planning methods inherent in resource-owning countries, allowing for direct market intervention.

A rudiment to the outdated planning model has been the programming of large production facilities linked to the interconnected system, with the rare exception of planning for the construction of small hydropower plants. The state, in developing the sector and responding to the needs of various sectors, can and must rely on small and medium-sized enterprises, which autonomously solve the problems of combining the necessary economic resources of the factors of production and satisfying the needs. Today it can be said that there are managerial failures in formation of approaches to development of small-scale local (alternative) energy of micro-generation and consumption. An objective fact is the indicator of small hydroelectric power plants, whose operations was previously recognized by the state as economically inadvisable, and only thanks to private initiative in recent years, some of them have started to operate and even modernized, and new ones were built.

Impact of Changes in Consumption Patterns, and Needs of the CBT Sector

Consumption patterns have changed significantly over the last 25 years. The number of large industrial consumers has decreased, the geography of consumption has changed, and negative aspects for MSMEs such as: instability of energy supply; lack of capacity; underdevelopment (lac) of low voltage distribution network infrastructure have started to appear. At the same time, there has been an increase in consumers (by MSMEs) in areas where capacity was not expected to be available to meet business (generation) needs. It should be noted that the energy efficiency approaches also do not take into account the full diversity and ways of doing business, and are in conflict with the economic interests of energy producing companies - entities are interested in increasing consumption, especially under conditions of credit obligations. Therefore, the interests of energy suppliers are partly in conflict with the interests of EE technology and material suppliers.

An overview of consumption by energy source indicates the following uses of fuels and energy resources for energy, heat and needs and uses for the production of services and goods.

Based on the results of the analysis presented by ISR Consult, a survey of respondents was conducted to identify the types of energy resources and energy used for heating properties in particular houses/organizations during the winter, which will improve the relevance of the sample on resource use and to compare the results of the survey of the tourism sector.

“When asked about the method of heating their home/organization in winter time, the majority of respondents answered coal* (74%), from the business sector electricity (86%). An interesting fact is that representatives of the business sector also use coal, wood and gas to heat their offices 74%”.

The questionnaire was conducted on a per oblast basis and allowed to determine the energy resources spent on heating by the population:

“Coal is used in Osh oblast (97%); a smaller amount is used in Bishkek (29%). Firewood is heated more in Talas oblast (78%) and less in Bishkek. Electricity is used more in Jalalabad oblast (48%) and less in Naryn oblast (24%)”.

Table 1: Energy use for heating by oblast			
Area	Coal	Wood	Electricity
Batken oblast, N=148	85%	46%	44%
Bishkek, N=154	29%	9%	39%
Osh, N=155	61%	19%	34%
Jalal-Abad oblast, N=163	82%	49%	48%
Issyk-Kul oblast, N=146	79%	63%	39%
Naryn oblast, N=147	82%	29%	24%
Osh oblast, N=157	97%	50%	31%
Talas oblast, N=145	80%	78%	39%

Source: ISR Consult survey results (Bishkek, 2019)

It is characteristic that the use of hydrocarbons for heating prevails over the consumption of electricity, most of which is generated by hydro-energy resources. An important confirmation of the predominance of hydrocarbons over clean energy resources is the answers of respondents to the question whether they use hydrocarbon resources for heating, cooking, hot water supply - 67% of respondents answered affirmatively, while 33% of respondents answered affirmatively

about using diesel/gasoline generators for electricity generation as an alternative (Figure 9).

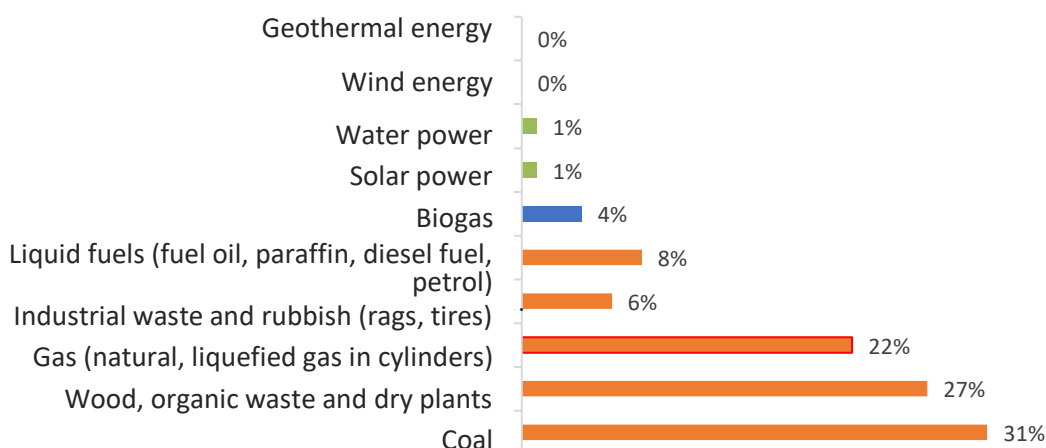
Figure 9: Do you use diesel/gasoline generators to generate energy?



Source: Results of a survey of CBT subjects (BizExpert)

The survey of the tourism sector actors showed what percentage of energy use is available for renewable energy.

Figure 10: Determining the ratio and actual use of energy resources to obtain therequired energy



Source: Results of a survey of CBT subjects (BizExpert)

Table 2. Calorific value table for fuels.

Fuel type	min	max	measure
Hard coal	21 000	30 000	kJ/ kg
Stoup	17 000	27 000	kJ/ kg
Brown lignite	7 500	21 000	kJ/ kg
Coke (fuel)	27 000	30 000	kJ/ kg
Peat - briquettes (up to 18% humidity)	13 000	16 000	kJ/ kg
Hardwood (15-18% humidity)	14 700	15 800	kJ/ kg
Fresh straw (wheat, barley)	12 000	14 900	kJ/ kg
Liquefied gas (propan-butan)	46 000	47 000	kJ/ kg
Natural gas GZ-50 wg pgnig.pl	31 000		kJ/ m3

Source: www.kotly.com.ua/kaloriynosty_topлива.htm

It is worth examining the use of gas, including biogas, separately from solid and liquid fuels and explain why gas (natural gas liquefied in cylinders) and produced biogas together occupy the third position in the CBT sector. The first explanation is the ease of use, maintenance of gas appliances, mobility compared to cylinders, the infrastructure of refueling stations. The connection to the natural gas distribution network for heating, hot water and cooking is due to the high efficiency of the appliances used, and the convenient of using gas systems and appliances.

The overall calorific value is objectively superior to other fuels, as shown in the table of calorific values of fuel (Table 2).

Capacity (Demand) Management

Capacity (demand) management in market systems of the post-industrial type of economic development - means meeting demand and programming demand growth in all sectors of the economy.

The post-industrial world strives for rationality, mainly in resources utilization, even if supply, somehow, must always exceed demand. In general, the problem comes from approaches based on growth projections from the capacity of the 'state energy sector' and from the objectives of continuity of supply - reliability of the unified system, with regulators guided not by the actual need to develop small sectors, but not from the operability of the energy system itself. In particular, the demand for alternative energy, small-scale, local micro-generation, energy efficiency, energy conservation is objectively linked to the development of business activities of suppliers and consumers, the latter being able to transform themselves into local energy producers.

Scientific and technological progress and technological advances have adjusted economic relations and the structure of consumption and even production. Thus, due to the availability and development of small generating equipment production, production and supply of smart regulation systems (automatic control devices), energy storage and conservation, own production and consumption are being formed, which predetermines the appearance of local small energy producers in the market. Self-supply becomes mass, more usable and more energy-efficient through the construction and installation of micro-generation facilities directly on site or as close as possible to the consumer. Massive use of alternatives to electricity generation from internal combustion engines through liquid fuel operation and gas combustion for heat production.

The resource savings from the high cost of connecting to the existing utilities of natural monopolists are not always offset by a lower tariff. The cost of providing electricity, heat, gas to a remote tourism facility may exceed the benefits of the entire tourism services activity, let alone the ability to recover these costs. In addition to the need and demand for energy from alternative sources, it should be noted that businesses cannot wait for the centralized system to pay attention to them and create infrastructures; businesses need speed, mobility of micro-generation, flexibility of energy supply conditions. As a result, the time and speed of implementation of business projects is now a key requirement for the consumer, who is already becoming a producer and supplier of RES-based energy, and is more interested in energy efficiency than anyone else. Such a demand

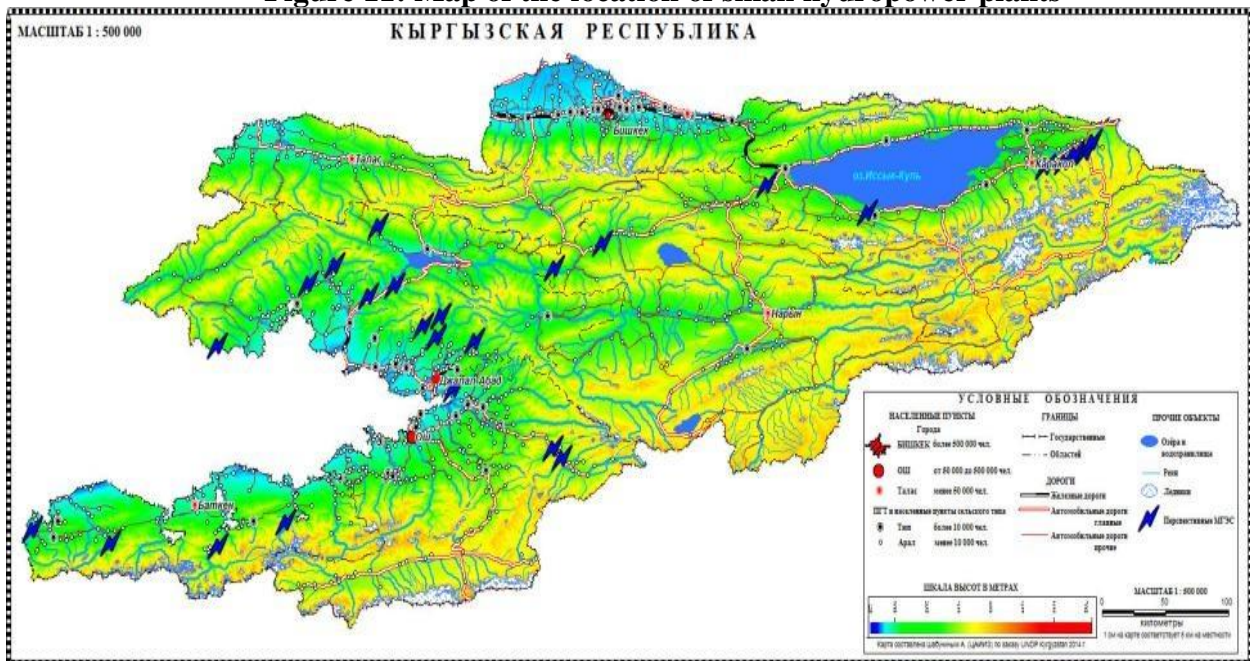
cannot a priori be met by the centralized energy system, and the policies being implemented are focused on the traditional sector and regulations. Today, dozens of Micro HPPs are operating across the country, using both imported equipment and their own custom-made (non-standard equipment and design solutions); there is no data on the exact number and capacity. Attempts to create digital models of demand management based on interactive maps, including those for the development of sectors of the economy ended with the creation of information maps reflecting the availability of capacity in the feeding centres of 110 kV, 35 kV substations, but the subscriber substations, the so-called connection points of the MSMB entities are not reflected⁵. Therefore, the availability or lack of capacity at the National Power Holding's high-voltage substations and networks is in no way linked to the needs of the MSMB entities.

The interactive map of SHPPs simply reflects the availability of these plants (in the demo version)⁶ and contains no other information, which is characteristic of a client-oriented capacity management system that does not include yet for small power and micro-production.

In the tributaries of large rivers, there are opportunities to use small watercourses of rivers and irrigation facilities and dikes. The Law on Renewable Energy of the Kyrgyz Republic defines the parameters of small hydropower plants up to 30 MW and refers to RES entities.

Today, the hydropotential of irrigation structures (canals, fast-flowing streams, reservoir locks) is not used. The geographical location of small rivers and fast-flowing rivers is in the upper and middle channels of river (mountainous areas), and irrigation facilities under dikes, dams (foothills, valleys) reservoirs, exactly where consumers, tourism entities and their facilities are concentrated, including irrigation facilities, are available in cities and settlements. Therefore, it is possible to use MicroHPPs (microgeneration) from 0.5 to 10 kW without damaging nature and even where there is a stable power supply, capacity and infrastructure of natural monopolists.

Figure 11: Map of the location of small hydropower plants



Source: GKPEN, <http://www.gkpen.kg/index.php/2018-01-09-06-46-22>

Typically, the trends towards the creation of a single energy market in the Customs Union (EAEU) countries, even though there are separate programmes and obligations, are now focused on the regulatory mechanisms of the existing energy system, indicating that small local energy producers are not considered as participants in this market, in contrast to the EU approaches, where decentralization of small energy facilities is accepted. The emergence of new self-supply technologies in the market at the end-user market with their transition to producers and sellers is

⁵ See GKPEN KR, Interactive Map of 110 kV, 35 kV Feeder Centres: www.open.gkpen.kg/energymaptest/

⁶ See GKPEN KR, Interactive map of small hydropower plants (Demo version): www.open.gkpen.kg/viamap

an inevitable process. Ignoring these changes, let alone hindering them, results in a loss of clean energy opportunities through private entrepreneurial initiative and small-scale investments.

Tariffs and Demand for Natural Monopoly Services

The energy sector in the Kyrgyz Republic is dependent on external factors of its hydrocarbons - and has risks in determining tariff policies arising from world prices of oil, oil products and gas.

Differences in the cost of electricity between domestic and commercial consumers result in an internal redistribution of funds from the sale (supply) of energy generated by large and small HPPs and CHPs, which does not cover the need for depreciation rates for generation and transmission facilities and does not allow for the accumulation of funds for development. Subsidies to the energy sector, together with rigid policy to contain the final (retail) price to the consumer generally distorts the essence of market relations. As a result, the affordability of energy is determined by tariff regulation, and these economic relations in the sector do not encourage residential energy users to reduce the costs of energy use, even with the application of a progressive volume-based electricity tariff.

Table 3: Electricity tariffs for end-users

Consumer Categories	End-user Tariffs	
	KGS/kWh	\$/KWh
Population, including:		
Up to 700 kWh per month (except for residents of high mountain regions from 1 October to 1 May)	0,77	0,011
In high altitude and remote inaccessible areas, for consumption of up to 1,000 kWh per month between 1 October and 1 May	0,77	0,011
For consumption above 700 kWh and 1,000 kWh per month	0,216	0,003
Non-domestic (public, industrial, agricultural, other)	0,224	0,003
Pumping stations	0,779	0,011

Source: GARTEK, <http://regulator.tek.kg/index.php/component/k2/item/313-tarif-na-elektroenergiyu/>

Tariffs for RES energy supplied to the unified energy system are set at the level of the maximum tariff established for the country, with increasing coefficients depending on the type of RES:

- for installations using water power, the coefficient is 2.1;
- for installations using solar energy, the coefficient is 6.0;
- for installations using biomass energy, the coefficient is 2.75;
- for wind power installations, the coefficient is 2.5;
- for installations using ground energy, the coefficient is 3.35.

There is a legal obligation on the part of the distribution utilities to purchase the proposed amount of RES-generated energy, as well as the right to a guaranteed connection to the distribution utilities' power grids. However, there is no evidence of supply, with the exception of the SHPPs.

All types of modernization, energy efficiency improvements of power plants, transmission networks and equipment are carried out with borrowed funds. It is assumed that the consumer will pay for the increase in capacity or, as in the case of business entities, will invest in the development of fixed assets of natural monopolists. As a result, consumers pay for maintenance and pay for various services of quasi-regulators (territorial bodies of the State Construction Committee, other agencies involved in the permitting system and resource management). At the same time, regulators support owners of energy assets, quasi-public energy companies, while consumers incur costs and continue to pay for services they do not need (there are payments for developing and

providing technical conditions for connection, developing a project, obtaining the required capacity). Investments in grids, substations, cumulatively create a cost for the energy supply project of the site that exceeds the cost of the local small-scale generation facility. The consumer - the tourism sector at the community level, firstly, cannot invest, secondly, he does not need the various services hidden behind the permit system, and thirdly, the natural monopoly entities themselves are not in a hurry to take the "consumer" scattered in the remote areas on the balance, built for the network and substations. Another factor of such monopoly management of the tariff policy is the application of various types of payments, in particular, payment for technical losses on transmission lines and transformations when dividing the balance sheet boundaries. Obtaining permits to use three-phase entry, obtaining capacity, changing the connection scheme, and often even small businesses require this. Thus, the cost of setting up the infrastructure, cumulative payments, time costs, natural remoteness, lack of required capacity at the nearest connection point, limitation of consumed capacity, even if the tariff is low - such services and services of natural monopolists become unrequested by MSME entities in the CBT sector.

Institutions

The State Committee for Industry, Energy and Subsoil Use (hereinafter referred to as GKPEN) is the central policy-making body authorized for energy and RE, EE development, and the Department of Tourism under the Ministry of Culture, Information and Tourism is the responsible body for tourism sector development.

The electricity policy objectives of the GKPEN:

The electricity policy objectives:

- **Coordination of activities to develop and ensure the functioning of the state system of long-term supply and demand forecasting system on the wholesale and retail electricity and capacity markets, including the development of a forecast of the electricity balance, including by region, and a system of measures aimed at meeting the electricity needs of the economy;**
- **organizing the development of programmes for the future development of the electricity sector;**
- **participating in the development of spatial planning schemes for electricity facilities;**
- **monitoring for the purpose of forecasting possible shortages of electricity capacity, preparing and implementing proposals for the creation of favorable conditions for capital investments or, if necessary, for public investments in the construction of electricity facilities in order to prevent the occurrence of electricity capacity shortages;**
- **monitoring the implementation and proposing adjustments to the strategic documents on the development of the electricity sector;**
- **forming a package of measures to ensure the achievement of the electricity sector development goals;**
- **preparing information and analytical materials in the field of electricity development;**
- **participating in the preparation of medium- and long-term regulations for the development of the electricity sector;**
- **participating in the development of measures for the modernization and reconstruction of power stations, substations, transmission lines and other electric power facilities.**

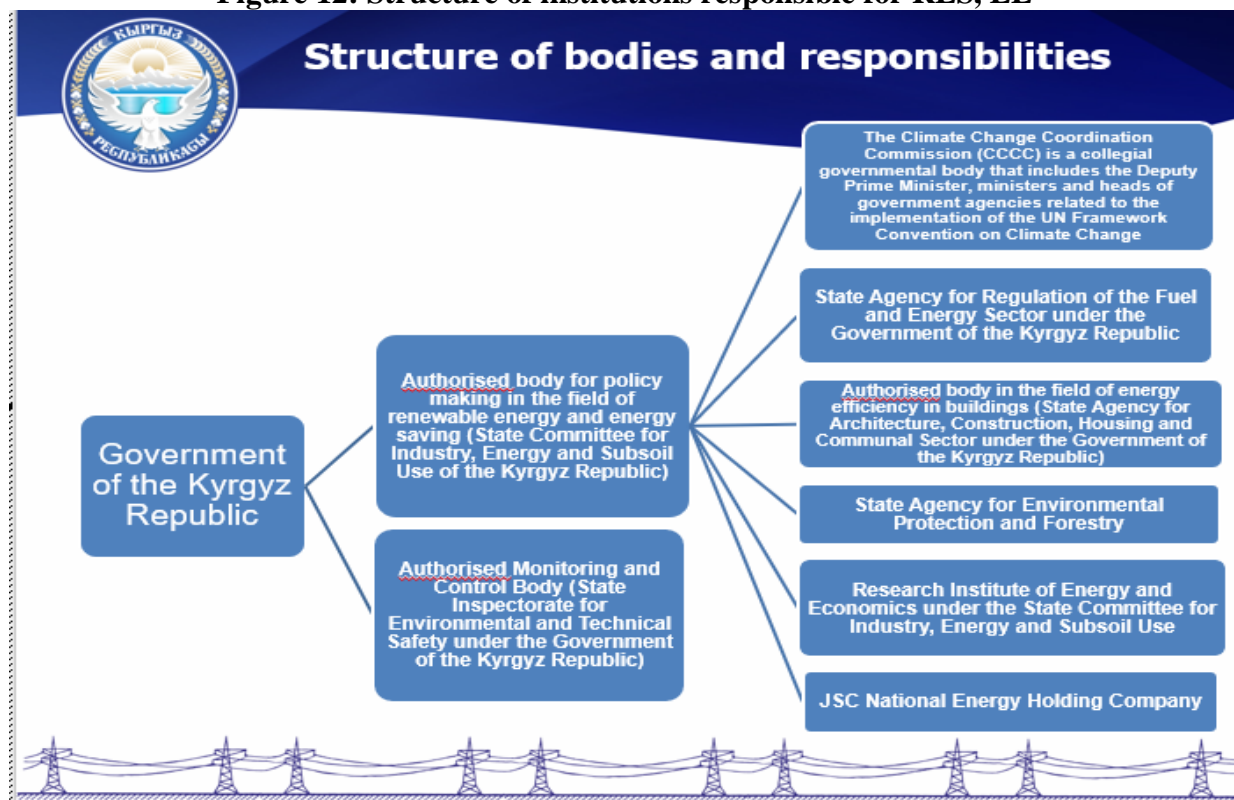
The Ministry of Economy is the authorized body responsible for business development policy, technical regulation, customs, tax and investment policy, while the body responsible for

tourism development is the Department of Tourism under the Ministry of Culture, Information and Tourism, the responsible body for sustainable tourism development and tourism infrastructure development.

The State Inspectorate for Environmental and Technical Safety is the state supervisory body, which monitors compliance with the mandatory requirements of the technical regulation system, compliance of entities with environmental legislation, norms and safety standards in the field of construction, monitoring compliance with norms and regulations of land, water and legislation of subsoil use. It does not have the power to legislate and only participates in the policy making process and permitting procedures, it does not issue permits for activities and only perform conformity assessment in the form of inspection, acceptance, testing and confirmation of safety. The State Agency for Regulation of Fuel and Energy Complex under the Government of the Kyrgyz Republic (KR) is the regulatory body in the field of production, transmission and sale of electricity, heat and gas (licensor), which carries out licensing control and is responsible for the development of tariff policy. The body responsible for metrology and verification of measuring instruments is the Centre for Standardization and Metrology under the Ministry of Economy of the KR. The State Agency for Environmental Protection and Forestry under the Government of the KR conducts state environmental expertise, implements state policy in the field of environmental protection and environmental safety, manages and implements obligations under global international conventions and monitors environmental pollution. The State Agency on Architecture, Construction and Housing under the KR Government develops and implements policies in the area of design, development of territories, licensing and permitting regulation of certain activities and construction of real estate, normative and legal, normative and technical regulation of construction, including energy efficiency of buildings and structures, as well as carrying out state expertise.

Two state agencies for land and water resources regulate land use relations, surface water use, maintain the real estate (land plots) register, and manage land and water resources. The Ministry of Agriculture and Food Industry and Land Reclamation of the KR is the authorized body to implement state policy in the field of land reclamation, water and land resources and irrigation infrastructure.

Figure 12: Structure of institutions responsible for RES, EE



Source: GKPEN presentation materials <http://www.gkpen.kg/index.php/2018-01-09-06-46-22>

The listed competent authorities are, in one way or another, responsible for policy development and implementation, and in this case the functional activities are considered through the prism of regulatory and management functions and powers, including the management of the development of the use of economic and natural resources in relation to the areas of legislation regulating certain business activities of suppliers and consumers. The preliminary conclusion is based on the interviewees' assessment of the implementation practices of the programme by the responsible authorities. The loss of the interdepartmental division of functions and power to develop necessary measures aimed at the development of private entrepreneurial initiative, the growth of business, the development of small energy sector activities of RES, EE and CBT consumers, as well as the presence of dysfunctional conflict between the economic objectives of the traditional energy sector and the alternative small energy sector. Using the terminology of political science, the latent conflict of interests of small and big business representatives can be considered as one of the barriers to the development of the suppliers and consumers sector. The spontaneity of the market and the entry of new technologies can create a partial alternative to the loss of economic efficiency of the centralized power system, but it is not the electricity producers themselves that lead to the loss of optimality in the electricity sector, but the distorted and inflexible state regulation of the cost of the basic electricity service and the sometimes mandatory related services monopolized by the centralized electricity industry. The policy documents laid down the vectors of necessary changes (extract from NSSD 2040, Energy Section)

“...transition to cost-effective rates that include the primary expenses of generating and providing electricity and heat to consumer. Tariffs that are favorable to investors would encourage the creation of alternative power and heat providers”.

However, the search for a reasonable balance in the implementation of the provisions of the legislation by the authorized bodies has been reduced to the evaluation and justification of the current economic advantages of the natural monopolists and the solution of the urgent problems of the energy system. The management of development has become dependent on the interests of strategic industry actors without taking into account and understanding that effective measures need to be taken to further develop and meet the needs of the national economy, to create conditions and develop the decentralized energy sector. Therefore, institutions, their mandates and functions need to be shaped to optimally utilize the potential of decentralized small-scale energy, which will ultimately increase the efficiency of the entire sector. The need for institutional changes has been highlighted in many studies and the creation of a single executive authority is included in the Green Economy Development Programme 2023, but concentrating everything in one authority is not always a good solution to problems of dysfunctional management system.

The website of the Kyrgyz Accreditation Centre under the Ministry of Economy of the Kyrgyz Republic provides a national register of accredited certification and conformity assessment organizations: <http://kca.gov.kg/registry.html>

The environmental movement BIOM, CREEED (Centre for Renewable Energy and Energy Efficiency Development), CAMP Alatau, CEEBA (Centre for Energy Efficient Building Central Asia), Unison, Fluid, Green Energy, Akmena are among the non-governmental institutions actively promoting clean energy and energy efficiency, and initiating climate change solutions and green economy development objectives.

Special institutes have been established - the Centre for Renewable Energy Problems of the Kyrgyz Republic (CREP) (Government Decree dated December 15, 1998 No. 824) and the Directorate for the Small and Medium Energy Development Project in the Kyrgyz Republic (Decree of the President of the KR dated May 2, 2008 No. 155).

The following business associations are active: Association "RES KR", Business Association JIA, AMFO Association, KCBTA "Hospitality Kyrgyzstan".

The following private companies operate in the country: MiMEC LLC, INKRAFT CJSC, Hydropower LLC, Datt Energy LLC, KES Zhuuku LLC, Ak-Buura Group LLC, Satellite 2005 OJSC, Kalinin HPP LLC, NewTech LLC, Shop 220.KG, Technoterm Shop, IE Malashev T.T.

(Greentech), SD Systems LLC, AYAK KG LLC, EST Group LLC, CIC LLC, ES Technology LLC, Inter Alliance LLC, Kinetics LLC, Invertor.KG Ltd, UPB BS Ltd, Smart Energy Solutions Ltd, Climate Technology Ltd, Dordoi Energy Ltd, Kyrgyz Wind System Ltd, ShamTur, Nursan Ltd, Ecobike Ltd, StinsCom Ltd, VEST Asia Ltd, IE Kovalenko (Prometey), IE Shaturny Ltd, Electrofarfor LLC, OJSC "Firm Santechma", Thermoflex LLC, Unison Consulting LLC, Gip Profi LLC, BiAst LLC, Biforce LLC, Saman Company, Mega Textile LLC, Teploinvest LLC, NTek LLC, Camping-Story LLC, etc.

ASSESSMENT OF THE IMPACT OF THE MEASURES IN THE POLICY DOCUMENTS ON INCREASING THE INCOME OF THE RENEWABLE ENERGY AND ENERGY EFFICIENCY SECTOR, ON REDUCING EMISSIONS IN THE TOURISM SECTOR

Programmes, strategic documents:

1. National Development Strategy of the KR for 2018-2040 <http://cbd.minjust.gov.kg/act/properties/ru-ru/430002/10>
2. "Programme of the Government of the KR for the Development of Tourism for 2019-2023" to Government of the KR Resolution dated January 31, 2019 No. 36 <http://cbd.minjust.gov.kg/act/properties/ru-ru/12943/10>
3. Programme and Action Plan of the Green Economy Development Programme in the KR for 2019-2023 (Ministry of Economy) <http://mineconom.gov.kg/ru/direct/302/335>
4. Decree of the Government of the KR "On the draft National Energy Programme of the Kyrgyz Republic for 2008-2010 and the Strategy for Development of the Fuel and Energy Complex until 2025" dated February 13, 2008 No. 47 <http://cbd.minjust.gov.kg/act/properties/ru-ru/58883/10>
5. Resolution of the Government of the KR "On Approval of the Strategy for Development of the Construction Industry of the KR for 2020-2030" dated January 17, 2020 No. 14 <http://cbd.minjust.gov.kg/act/properties/ru-ru/157430/10>
6. Decree of the Government of the KR "On Approval of the State Irrigation Development Programme of the KR for 2017 – 2026" dated July 21, 2017 No. 440 <http://cbd.minjust.gov.kg/act/view/ru-ru/100162?cl=ru-ru>
7. Decree of the President of the KR "On Approval of the Programme for Development of Small and Medium-Sized Energy Sector in the Kyrgyz Republic until 2021" dated October 14, 2008 No. 365 <http://cbd.minjust.gov.kg/act/properties/ru-ru/4778/10>
8. Decree of the President of the KR "On specific measures for the development of small and medium-sized energy in the KR " dated October 14, 2008 No. 365 <http://cbd.minjust.gov.kg/act/view/ru-ru/4777>

Concepts:

- The Concept of Green Economy in the KR "Kyrgyzstan - the country of green economy" (Approved by the Resolution of the Jogorku Kenesh of the KR dated June 28, 2018 No. 2532-VI) <http://cbd.minjust.gov.kg/act/properties/ru-ru/83126/10>
- Concept for the Development of the Fuel and Energy Complex of the KR until 2030 (GKPEN) <http://www.gkpen.kg/index.php/home1212/574-2030>

The overall priorities for the development of the electricity sector are defined in strategic and policy documents:

- **Modernization and expansion of the production capacity and generating capacity of the electricity sector and improvement of its efficiency through the use of new equipment, introduction of automated control systems and optimal regulation of load schedules;**
- **Commissioning of new generating capacity and transmission lines;**
- **Establishment of the necessary institutional framework and regulatory framework;**
- **Ensuring the implementation of a balanced tariff and pricing policy to cover the actual costs of energy companies for generation, transmission and distribution of electricity and heat, and to reduce cross-subsidies;**
- Creating a full-fledged domestic energy market with a competitive generation and sales environment through the construction of small hydropower plants and other alternative sources;

- **Improving conditions for attracting private investments in the development of the sector on the basis and principles of public-private partnership;**
- **Strengthening energy saving potential in energy production, transmission and consumption.**
- Updating energy conservation (energy efficiency) standards and bringing them in line with advances in science and technology.

The main objectives are set, but the assessment of the actual impact by the interviewees and the opinions expressed by the participants in the focus group discussion agree on one point: the quality implementation of the policy documents will ensure growth of RES-based small-scale energy sector and increase the use of energy efficient technologies, materials and will have a positive impact on the environment. Attention should be paid to certain gaps in the strategic documents and implementation plans as well as the lack of policy documents on energy efficiency. Clearly, the identified energy development priorities are in line with the development and modernization of the energy sector. The attitudes of the suppliers sector towards energy efficiency objectives affect the interests of large consumers and the producers and sellers of heat and electricity themselves. Gaps in the long-term planning system for the MSME development without taking into account the energy efficiency needs of small businesses - typical in defining economic -policies approaches to the development of the traditional energy sector, where the emphasis is on the development of large projects and entities. An objective fact is the recognition of clear problems with the implementation of investment attraction tasks, in the absence of internal investment and private entrepreneurial initiatives, the necessary resources for modernization, energy efficiency growth of the energy sector. This situation indicates that the lack of two production factors - the basic economic resources for new production capacity, modernization and energy efficiency growth - has not been taken into account.

Concept for the Development of the Fuel and Energy Complex of the KR for 2019-2030⁷

The first thing to pay attention to is the wording "RES development", as many do not understand how renewable resources, which are natural energy sources, can be developed. However, this formulation of development objectives indicates the loss of economic sense in the development of activities based on the use of RES, conversion of RES into other types of energy products. Essentially, the Concept documents constitute a coherent vision for the development of the sector, vertically correlated with the adopted governmental program and oriented towards achieving the development goals of the NSSD 2040 strategic document. Secondly, the Concept has no implementation mechanisms, i.e. there is no concrete action plan of measures to achieve a specific result. Thus, the Concept is an intermediate document before the development of the sector programme. It should be noted that the Government Decree "On Approval of the Concept of Fuel and Energy Complex Development until 2030" instructed the authorized body to develop the National Energy Program for the period 2020 - 2022 in implementation of the concept in the following areas:

- **Improvement of fiscal policy by providing tax and credit incentives for renewable energy (RE) development, consideration of tariff policy for RE, introduction of energy-saving and environmentally friendly technologies and equipment.**
- **The future development of a low-carbon green economy will be fostered by predominantly large hydro power production, which will account for 70% of total production, with the share of renewables increasing from 1.5% to 5%, thus keeping GHG equivalent emissions at current levels.**

⁷ considered selectively in the context of RES development: www.gkpen.kg/index.php/home121212/574-2030

- **Solving social problems: the involvement of RES with the construction of small hydropower plants, solar energy plants and biogas plants will contribute to the security of energy supply in the regions of the country.**
- **Establish cooperation with international donor organizations and climate funds in order to coordinate and raise funds for renewable energy development.**
- **Favorable preconditions: decisions of the Paris climate conference on climate change mitigation and support for countries with predominantly renewable energy production and use.**

However, there is still no policy document, and it is precisely this implementation that has been noted by private sector actors as not being of high quality. Objectively, the above discussed documents and the approaches to their creation do not contain any result-oriented business sense in the form of increased profits, increased production and sales, or even the prerequisites for developing entrepreneurship.

For reference: The MSME development programme has not been adopted and sector approaches aimed at developing private entrepreneurial activities were excluded during the drafting phase. The interdepartmental division of functions and areas of responsibility in the planning and programming of industries and entrepreneurship development, in particular the drafting of the entrepreneurship development programme, is the responsibility of the Ministry of Economy, whilst the development of the industry economy is in the hands of the sectoral body GKPEN, and this is the failure of the public administration system. There is a loss of meaning in programming entrepreneurship development in relation to sectoral entrepreneurship, to specific types of activities, let alone programming taking into account the inter-sectoral balance and responding to the emergence of multi-industry businesses, which create mini economic clusters - ecosystems.

Another interesting fact is the adoption in 2008 of the 25-years sector strategy (the current document), together with the National Energy Programme for 2010. A vertical comparison of the programmes and implementation plans shows a lack of implementation and actual results with regard to clean energy development, small-scale energy and even more the business activities whose objectives are transferred from one document to another.

The Green Economy Development Programme in the Kyrgyz Republic until 2023

This document has defined and, in part, is already implementing policies to develop and increase the use of renewable energy and the application of EE. A special programme for the development of a green economy has partially addressed the problem of inter-sectoral failure. It covers several sectors and motivated by the objectives of environmental conservation, reduction of negative impact on nature, reduction of emissions and sustainable development. However, all government programmes address an undefined range of actors, which indicate a lack of consideration of the interests and needs of MSMEs, sectors of the consumer economy in need of alternative, clean energy, in this case the tourism sector (CBT) with development initiatives.

FCS sector actors point out that there are gaps in the targeting of support measures for sustainable financing. An important task from the expert point of view is the development of private initiative to develop small local energy, microgeneration, but the Green Economy Programme does not include implementation measures, although such a direction is being considered. The programme includes directions for the development of micro-generation at the domestic level, but not for MSME economic entities.

Excerpt from the programme:

"A particularly important area for the Kyrgyz Republic, which many private households are interested in, could be microgeneration based on RES (in the homes of citizens), improving the rational use of energy resources and allowing the establishment of a technological practice of two-way network-consumer interaction. Simple mechanisms will

be developed to ensure that private households have access to the grid as a seller and guarantee purchase of surplus electricity generated by the owners of such generating facilities".

The lack of an effective positive impact on the economy of the sector is understandable - there are no implementation mechanisms and no defined approaches to the development of small-scale RES-based generation. Separately, it should be noted that the policy document does not address the low energy efficiency of the tourism sector and tourism properties. It is worrying that for small-scale energy development, small-scale production, it is necessary to determine the feasibility at district level based on calculations of the cost of energy supply from the national grid. Who and how will decide who has the right to determine how and where to apply their entrepreneurial skills, entrepreneurship and investment initiative except the entrepreneur himself. It is proposed that feasibility should be determined according to the interests of the unified energy system. This is the case with the distribution model of energy sector development, which is based on centralization.

Excerpts from the Green Economy Programme:

"For the development of RE in Kyrgyzstan, the feasibility of introducing them at the district level will be determined based on calculations of the cost of electricity supply through the national grid, the potential and cost of RES to be installed in a given district. An assessment of the benefits and costs of introducing RES compared to maintaining energy supply through the national grid will make it possible to develop recommendations for each district, taking into account projections of growth in energy consumption until 2040. According to the calculations made, national targets for the introduction of RES will be set, with a defined installed capacity and type of RES by district (quotas)".

The intention of introducing quotas and setting capacity parameters instead of normative-technical standards is also puzzling. The emergence of such regulators is an unjustified interference in business affairs and relations between entities in terms of negative impact on the development of private initiative. Attention should be drawn to the fact that the following objectives are set and the distribution model of the energy sector is being programmed:

"Increasing the share of renewable energy in total final energy consumption. Diversification of renewable generation capacity will increase resilience to climate change and provide distributed solar, wind, and other district-level generation in line with available local resources".

Promoting renewable energy technologies, informing about the need and benefits of the consumer, capacity building of stakeholders, officials of ministries, agencies, LSG bodies, launching additional and special educational programs is a positive step, but the implementation of this approach requires resource support. FGDs participants from the educational sector, which implement their tasks of training and development of training disciplines, stated the lack of scientific and practical information for the development of training modules, it turns out that the task of staffing and the emergence of competent professionals is questionable.

Expected results, when implemented in line with the objectives: rational and economical use of energy resources, reduction of CO2 emissions and benefits of energy saving and switching to clean and energy efficient technologies for health:

- **Reduce the energy intensity of GDP by 10% by 2023;**
- **Reduced energy consumption in residential, public, administrative, mixed-use and non-production buildings by 10% by 2023;**
- **Reduced transmission and distribution losses to 12% by 2023;**
- **100% commercial losses have been eliminated;**
- **Renewable energy facilities with a total installed capacity of at least 50 MW have been commissioned;**

- A medium-term tariff policy for the period 2018-2023 has been developed and implemented to ensure break-even in the energy sector;
- Transparency, efficient management and financial sustainability of energy companies are ensured, allowing for the maintenance and timely modernisation of existing generation capacity, transmission and distribution infrastructure;
- Increased private investment in the energy sector of over \$300 million by 2023. The energy sector has increased private investment in the energy sector to more than \$300 million by 2023;
- A reliable and uninterrupted supply of all types of energy and fuel resources to the population is ensured.
- The population supports and actively implements energy efficient technologies and RE at household level
- There is a sustainable and effective system of training and professional development in place

State Program for Development of Irrigation of Kyrgyzstan for 2017-2026

The Irrigation Development Programme 2026 aims to improve irrigation and develop new land for agriculture. One of the expected results in the form of benefits is considered to be the promotion and creation of prerequisites for the development of processing and mining industries and small-scale hydropower.

The country has about 3,000 rivers and streams with a total annual flow of about 47 km³, of which the KR uses only about 10 km³ (about 20%). However, water use for energy generation and water use for irrigation purposes have significant differences. The use of water for energy generation involves the return of water to the stream and consists of using the physical power of water to drive machinery. The interrelationship between irrigation development and the use of irrigation facilities for energy generation is clear and is recognized by the government. The policy document highlights the objective of generating economic benefits from irrigation development for several sectors, including small-scale energy:

"New irrigation dams can be used to generate electricity (but only in irrigation operation). This would create the conditions for the development of mining and industry, which would contribute to the economic development of remote rural areas."

It should be noted that despite all the descriptive approach to the objectives and possible benefits in the programme, there are no energy-related development measures in the implementation plan, the reason is trivial, there is no inter-sectoral linkage and therefore no assessment of the presence/absence of private initiatives when there is a need. This situation indicates an inter-sectoral gap, which prevents the use of state support measures to develop the use of RES.

Sectoral Tourism Development Programme

The Sectoral Programme for Tourism Development contains the objective of tourism infrastructure development, without disclosing a complete list of infrastructure facilities themselves and without prioritizing the energy supply of tourism facilities. It is important that the sectoral document is vertically subordinated to the development objectives set out in the Strategy 2040. The measures envisaged in the implementation plans focus on creating legal and economic conditions conducive to the development of the sector. It should be noted that there is a management inter-sectoral gap at the development planning stage between the needs of the tourism sector and the development plans of the energy sector itself. Addressing small consumption in hard-to-reach areas, sometimes not economically feasible to supply energy from the centralized energy supply system and not profitable for the consumers in terms of high investments in engineering networks and energy supply systems (transmission lines, substations, etc.). In general, the current document does not set any emission reduction targets for the tourism sector and does

not set any targets for the development of small "tourist energy" micro-generation forming local infrastructure based on RES, nor does it include any measures to improve the energy efficiency of tourism facilities, and tourist services. In general, the MMSB consumer in other areas of the economy is in a similar situation.

Sustainable Tourism (Green Economy Programme)

The Green Economy Programme contains the objective of the CBT development, defines the range of CBT subjects as the most interested party in nature conservation. The document provides quantitative information on the activities of CBT subjects. Since 2003, KCBTA has brought together 15 CBT groups.

In 2008, CBT groups created 412 jobs with an average salary of US\$40 a month, and households in Arslanbob (Jalalabad province) involved in ecotourism earn between US\$245 and US\$306 a year, averaging 15-25% of their annual income:

“The study found that CBT groups cater to about 10,000 foreign tourists a year. Assuming an average 8-day average tourist stay costing US\$20 per day, it averages out to about US\$1.6 million per year”.

Note: These calculations are based before the Covid-19 pandemic, during the entrepreneurial initiatives boom and the active implementation of tourism development measures. Within the framework of the tasks of creating legal conditions, in particular the introduction of eco-standards, eco-certification and measures to stimulate and support tourism entities. The use of green technologies is also identified as one of the priorities. In contrast to many sectoral programmes, the Green Economy Programme has an overall economic objective of growing the sector and increasing the income of the local population (from involvement in the tourism business), all subordinated to the goals of Green Tourism development. At this stage, there are still no implementation mechanisms and measures to achieve these objectives.

The Green Economy Programme includes and partly already implements policies aimed at the development and growth of renewable energy and EE applications. However, all government programmes are aimed at an undefined range of actors, which indicates the lack of consideration of the interests and needs of MSMEs, sectors of the economy in alternative, clean energy, in this case the tourism sector at the level of CBT. An important task from the expert point of view is to programme private initiative to develop small local energy, micro-generation. Although the Green Economy programme does not yet include implementation measures, it does envisage such a direction.

“It is assumed that the development of micro-generation of RE at the household level, in addition to the rational use of available natural resources, will make it possible to establish a technological practice of two-way "consumer-grid" interaction, which in turn will allow the sale of surplus through a single distribution network. It was also envisaged that such supply of renewable energy would not be subject to taxation.”

No implementation mechanisms have been adopted yet, but it should be noted that the implementation of these approaches relies on mandatory purchase of energy by distribution companies, for onward transmission, sale of the resulting surplus from households, and the introduction of netting practices (reverse energy flow). Accordingly, such approaches in the regulation of economic relations are inherent to the distribution model of the energy sector. The core of the problem is the use of fixed assets (distribution networks) of energy companies, but tourism facilities are usually located outside the single grid coverage and the costs of technological connection (construction of lines and systems to the point of connection) exceed the benefits. Moreover, virtually all available approaches do not reveal and do not predetermine the vector of small-scale energy development based on the use of other types of renewable energy, and for reasons that are not clear, the need to restore the use of outdated technologies of water, wind energy

directly to transfer kinetic energy to machinery is not considered at all. The refusal to use outdated technologies, objective changes in the economic structure, and traditional methods of production need to be rethought.

Historical background: Before the advent of the electric drive, a method of mechanical transmission of energy was used to power machinery. For example, there is a tourist site near Karakol where a water mill has been in operation for more than a century. In the town of Uzgen, a water mill for threshing rice is also in operation. Demonstration of obsolete methods of production, processing and treatment of agricultural products can become an additional tourist product and enable the use of RES, including those based on modern advances in mechanics.

According to other information, in 1879 there were 25 water mills only on the rivers flowing into Lake Issyk-Kul.

Mid-nineteenth-century industrial buildings and facilities						
Years	1889	1891	1892	1905	1910	1913
Water mills	2	3	12	12	15	11

Source: Turdaliev M. www.science-journal.kg/media/Papers/nntiik/2013/5

(Aitmambetov, 1967: www.open.kg/about-kyrgyzstan/nature/soil-and-minerals/34729-poleznye-iskopaemy)



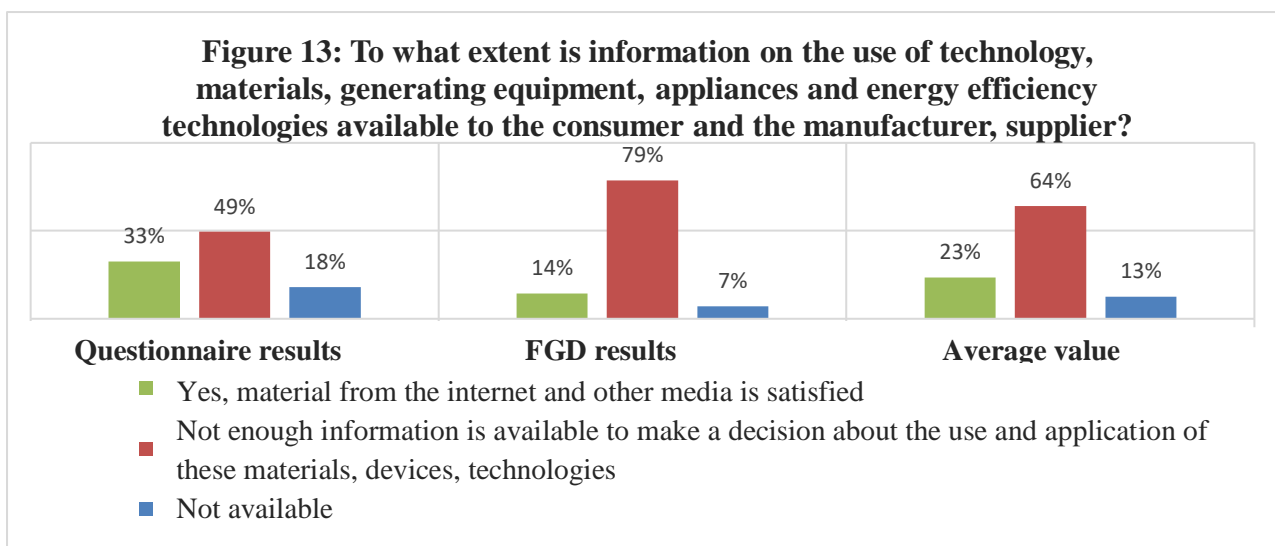
It is clear from the historical record that the population used the pure energy of nature; whether or not the past can be repeated is an open question.

Photo: Watermill in Ak-Suu;
https://www.tripadvisor.ru/ShowTopic-g815340-i29386-k11928685-Karakol_Issyk_Kul_Province

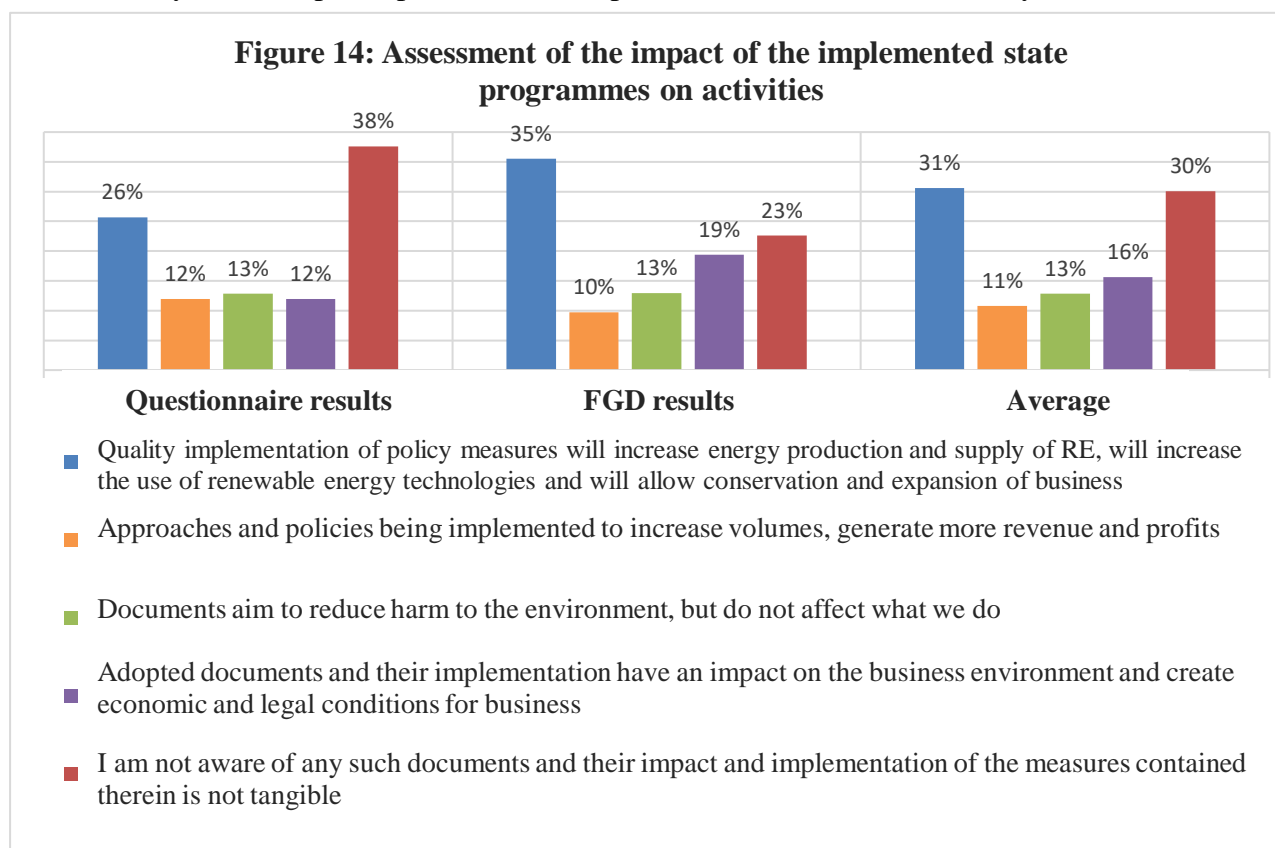
Energy Efficiency or Energy Conservation

According to policies (strategies, programmes) adopted and implemented in KR, energy efficiency is considered one of the development priorities of the energy sector itself, while there are no policy for energy efficiency growth in other sectors of the economy in the long term. No energy efficiency programme has been adopted, and the fragmented energy efficiency and energy saving guidelines, in one case, as in the Strategy for Development of the Construction Sector up to 30 years, are applicable only to the real estate under construction, or buildings of public institutions; in another case, to objects of previously constructed multi-storey residential building stock. The legislation focuses on energy efficiency and energy saving, and first of all, on effective use of energy resources in production of energy from natural resources, including solid and liquid fuel and gas used for heat and electric power production in CHPs and boiler houses. An objective contradiction of policies' objectives is an economic conflict of interest between the growth of sale of generated energy and benefits from economical consumption due to technologies and EE materials by the other party (the consumer). This situation does not allow for effective policy-making by the authorized authority, whose functional tasks include the development of coal mining, development of the energy sector, and development of the consumer industry.

The problem is a very low level of awareness of consumers, population, property owners, entrepreneurs and managers, regarding the use of energy efficiency and RES to address local problems of energy supply of facilities, energy saving, resource saving and emission reduction. This situation indicates a lack of initiatives from the real sector (consumers), which prevents the development of a balanced sectoral energy efficiency policy.



The implemented policies and sectoral energy efficiency programme measures are mainly related to the process of energy sector modernization itself, while the application of impact measures to limit capacity and consumption are applied seasonally only in the autumn-winter season, characterized by overloaded equipment, networks and generation shortages, and do not pursue energy efficiency goals. The diagram reflects the assessment of the impact of the policy documents by the FGD participants and the respondents as a result of the survey:



The following conclusions were drawn from the analysis during the development phase of the energy efficiency concepts in 2014:

“Residential heat losses are several times higher than in countries with similar climates. The main factor hindering the implementation of energy saving measures in budgetary organizations in the current economic conditions measures is the absence of mechanisms for stimulating energy saving and insufficiency of financial resources for their implementation”.

Accordingly, the follow-up actions implemented by the policies were aimed at solving the problems identified.

It is assumed that this assessment of the impact of the programme documents is linked to:

- The non-implementation of some of the adopted policy documents;
- Not achieving the actual indicators, indicators.

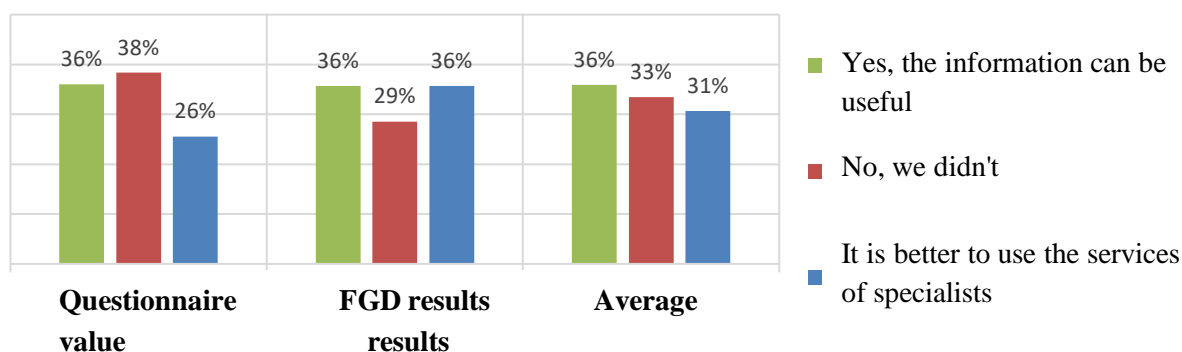
However, 35% of the respondents believe that it is the quality implementation of the policy documents that will increase the business of RES, EE suppliers, while 23% of the participants believe that there is no impact and they do not know anything about the programmes. 19% of the respondents, which is almost half of those who believe that qualitative implementation of the policy documents will give growth, development. Positive impact is defined by only 10% and it is noted an increase of income, profit, volume growth. The indicator of 10% of economic growth of revenues and profits is negligible, therefore it cannot be taken into account and assessed as a positive impact.

The legal basis for the implementation of energy saving requirements and efficient operation of enterprises has been formed in the KR. Both laws "On Energy Conservation" and "On Energy Efficiency of Buildings", establish legal norms for the implementation of state energy efficiency policy, as well as legal norms for creating and operating institutional economic and informational mechanisms to implement this policy.

Policy Documents on Business Infrastructure Development and Information Support Measures

One of the tasks defined in the policy documents is the creation and development of entrepreneurial infrastructure, including in the form of public-private partnerships (Green Economy Programme). Based on the results of the survey and the FGDs, participants described the challenges in developing business infrastructure. Almost all participants reported problems and mentioned the lack of practical implementation of state information support measures for MSMEs. KFS also reported difficulties in assessing the risks of green lending to entities in the absence of information and advisory services.

Figure 15. Have you ever used information resources to calculate the efficiency of financial investments, to gain benefits/optimize costs in decision-making?



This situation is typical for countries with an underdeveloped support infrastructure for entrepreneurs and a practical absence of business information services. The market of engineering, energy services in the country is practically underdeveloped: almost all pilot projects are financed by donors, which provide technical consultancy.

For reference: Information support measures are stipulated by the Law of the KR "On state support for small and medium-sized enterprises", however, the policy documents are intended for information campaigns and do not contain practical measures aimed at the development of business infrastructure, the implementation of the law is carried out with the resources of donor organizations.

ASSESSMENT OF THE STATUS AND IMPACT OF LEGISLATION ON THE DEVELOPMENT OF RENEWABLE ENERGY GENERATION AND CONSUMPTION AND THE USE OF TECHNOLOGIES, MATERIALS TO INCREASE ENERGY EFFICIENCY

Primary Legislation

- Civil Code of the Kyrgyz Republic, Part 1 dated May 8, 1996 No. 15
<http://cbd.minjust.gov.kg/act/properties/ru-ru/4/660>
- Civil Code of the Kyrgyz Republic, Part 2 dated January 5, 1998 No. 1
<http://cbd.minjust.gov.kg/act/properties/ru-ru/5/310>

Legislation in the field of Energy (RES, EE)

- Law of the Kyrgyz Republic "On Renewable Energy Sources" dated December 31, 2008 No. 283 <http://cbd.minjust.gov.kg/act/properties/ru-ru/203243/70>
- Law of the Kyrgyz Republic "On Energy" dated October 30, 1996 No. 56
<http://cbd.minjust.gov.kg/act/properties/ru-ru/663/40>
- Law of the Kyrgyz Republic "On Electric Power Engineering" dated January 28, 1997 No.8
<http://cbd.minjust.gov.kg/act/properties/ru-ru/508/180>
- Law of the Kyrgyz Republic "On Energy Conservation" dated July 7, 1998 No. 88
<http://cbd.minjust.gov.kg/act/view/ru-ru/96/70?mode=tekst>
- Decree of the Government of the Kyrgyz Republic "On Approval of the Regulations on the Conditions and Procedure for Conducting Activities for Generation and Supply of Electricity Using Renewable Energy Sources" No. 525 dated October 30, 2020
<https://www.gov.kg/ru/npa/s/2768>
- Order of the State Committee for Industry, Energy and Subsoil Use of the Kyrgyz Republic "On Approval of the Standard Contract for Supply of Electricity Produced by the Electricity Producing Enterprise Using Renewable Energy Sources to the Distributing Enterprise" dated April 28, 2017 No.1/1 <http://cbd.minjust.gov.kg/act/view/ru-ru/200128>
- Decree of the Government of the Kyrgyz Republic "On Approval of the Rules for Use of Electricity" dated August 22, 2012 No. 576 <http://cbd.minjust.gov.kg/act/view/ru-ru/93715>
- Regulation "On the tender for the right to build small hydropower plants in the Kyrgyz Republic", approved by the Decree of the Government of the Kyrgyz Republic dated March 24, 2017 No. 175 (amended as of June 14, 2017) <http://cbd.minjust.gov.kg/act/view/ru-ru/99853>.

Tourism Legislation

- Law of the Kyrgyz Republic "On Tourism" dated March 25, 1999 No. 34
<http://cbd.minjust.gov.kg/act/properties/ru-ru/201/10>
- Decree of the Government of the Kyrgyz Republic "On Approval of the Regulations on the Procedure of Land Use in State Natural Parks of the Kyrgyz Republic" dated October 5, 2015 No. 677 <http://cbd.minjust.gov.kg/act/properties/ru-ru/98139/10>
- Decree of the Government of the Kyrgyz Republic "On Approval of Regulations on the Procedure for Use of Land for Nature Protection, Health Care, Recreational and Historical and Cultural Purposes in the Republic of Kyrgyzstan" October 12, 1992 No. 502
<http://cbd.minjust.gov.kg/act/properties/ru-ru/39586/10>

Environmental Legislation

- Law of the Kyrgyz Republic "On Biosphere Territories in the Kyrgyz Republic" dated June 9, 1999 No. 48 <http://cbd.minjust.gov.kg/act/properties/ru-ru/213/30>
- The Law of Kyrgyz Republic "On mountain territories" dated November 1, 2002 No. 151
<http://cbd.minjust.gov.kg/act/properties/ru-ru/1108/30>

- The Law of Kyrgyz Republic "On Environmental Protection" dated June 16, 1999 No. 53 <http://cbd.minjust.gov.kg/act/properties/ru-ru/218/145>
- Law of Kyrgyz Republic "On Specially Protected Natural Areas" May 3, 2011 No. 18 <http://cbd.minjust.gov.kg/act/properties/ru-ru/203262/40>
- Decree of the Government of the Kyrgyz Republic "On Approval of the Procedure for Use and Disposal of the State Forest Fund" dated 10 April 2018 No. 192 <http://cbd.minjust.gov.kg/act/properties/ru-ru/11731/10>
- Law of the Kyrgyz Republic dated May 8, 2009 No. 151 "General Technical Regulations on Environmental Safety in the Kyrgyz Republic" <http://cbd.minjust.gov.kg/act/properties/ru-ru/202693/30>

Water and Subsoil Use

- "Water Code of the Kyrgyz Republic" dated January 12, 2005 No. 8 <http://cbd.minjust.gov.kg/act/properties/ru-ru/1605/90>
- Law of the Kyrgyz Republic "On Water" dated January 14, 1994 No. 1422-XII <http://cbd.minjust.gov.kg/act/properties/ru-ru/729/90>
- Law of the Kyrgyz Republic "On Drinking Water" dated 25 March 1999 No. 33 <http://cbd.minjust.gov.kg/act/properties/ru-ru/200/70>
- Law of the Kyrgyz Republic "On Subsoil" dated May 19, 2018 No. 49 <http://cbd.minjust.gov.kg/act/properties/ru-ru/111782/25>
- Law of the Kyrgyz Republic "On Natural Therapeutic Resources, Health-Resort Locations and Resorts" dated January 13, 2000 No. 4 <http://cbd.minjust.gov.kg/act/view/ru-ru/312>
- Decree of the Government of the Kyrgyz Republic "On Transfer of Water Management Facilities into Ownership of Water Users Associations and their Formations" dated April 6, 2004 No. 234 <http://cbd.minjust.gov.kg/act/properties/ru-ru/55249/10>

Land Use (Properties and Registration)

- Land Code of the Kyrgyz Republic dated June 2, 1999 No. 45 <http://cbd.minjust.gov.kg/act/properties/ru-ru/8/530>
- Law of the Kyrgyz Republic "On Transfer (Transformation) of Land Plots" dated 25 July 2013 No. 145 <http://cbd.minjust.gov.kg/act/properties/ru-ru/203953/50>
- Law of the Kyrgyz Republic "On State Registration of Rights to Immovable Property and Transactions Therewith" December 22, 1998 No. 153 <http://cbd.minjust.gov.kg/act/properties/ru-ru/160/150>
- Law of the Kyrgyz Republic "On Management of Agricultural Land" dated January 11, 2001 No. 4 <http://cbd.minjust.gov.kg/act/properties/ru-ru/386/170>
- Law of the Kyrgyz Republic "On Pastures" dated January 26, 2009 No. 30 <http://cbd.minjust.gov.kg/act/properties/ru-ru/202594/60>
- Law of the Kyrgyz Republic "On introducing a moratorium on the transfer (transformation) of irrigated arable land into other land categories and types of land" dated July 31, 2009 No. 257 <http://cbd.minjust.gov.kg/act/properties/ru-ru/202627/130>
- Decree of the Government of the Kyrgyz Republic "On Approval of the Regulation on State Land Registration (Land Cadastre)" dated March 17, 2014 No. 137 <http://cbd.minjust.gov.kg/act/properties/ru-ru/96209/10>
- Decree of the Government of the Kyrgyz Republic "On Approval of the Model Provision on the Procedure and Conditions for the Fee-Based Granting of Title or Lease of Land Plots in Municipal Ownership" dated 23 September 2011 No. 571 <http://cbd.minjust.gov.kg/act/properties/ru-ru/95276/30>
- Decree of the Government of the Kyrgyz Republic "On Approval of Regulations on the Procedure of Lease and Use of Pastures" dated June 4, 2002 No. 360 <http://cbd.minjust.gov.kg/act/properties/ru-ru/53525/20>

- Decree of the Government of the Kyrgyz Republic dated June 22, 2007 No. 243 “Standard Regulation on the Conditions and Procedure for Leasing Land from the Agricultural Land Redistribution Fund” <http://cbd.minjust.gov.kg/act/properties/ru-ru/58390/40>

Construction Regulation

- Housing Code of the Kyrgyz Republic dated July 9, 2013 No. 117 <http://cbd.minjust.gov.kg/act/properties/ru-ru/203926/30>
- Law of the Kyrgyz Republic "On Urban Planning and Architecture of the Kyrgyz Republic" dated 11 January 1994 No. 1372-XII <http://cbd.minjust.gov.kg/act/properties/ru-ru/716/180>
- Law of the Kyrgyz Republic "On the Fundamentals of Urban Planning Legislation of the Kyrgyz Republic" dated July 13, 2011 No. 95 <http://cbd.minjust.gov.kg/act/properties/ru-ru/203338/30>
- Law of the Kyrgyz Republic "On energy efficiency of buildings" dated July 26, 2011, No. 137 <http://cbd.minjust.gov.kg/act/properties/ru-ru/203377/30>
- Law of the Kyrgyz Republic "On Individual Residential Construction in the Kyrgyz Republic" dated December 21, 1991, No. 689-XII <http://cbd.minjust.gov.kg/act/properties/ru-ru/901/50>
- Decree of the Government of the Kyrgyz Republic "On Approval of the Rules for Construction, Improvement, Technical Operation and Maintenance of the Issyk-Kul Region Resort and Recreation Area" dated October 2, 2007, № 445 <http://cbd.minjust.gov.kg/act/properties/ru-ru/58582/10>
- Decree of the Government of the Kyrgyz Republic "On Approving the Regulation on the Classification of Characteristics of Construction Sites and the Procedure for State Architectural and Construction Supervision of Construction, Reconstruction and Other Changes of Real Estate in the Kyrgyz Republic" dated February 10, 2009 No. 95 <http://cbd.minjust.gov.kg/act/properties/ru-ru/70048/20>
- Resolution of the Government of the Kyrgyz Republic "On Approval of the Regulation on Urban Planning Cadastre in Cities of Regional Significance of the Kyrgyz Republic" dated August 11, 2009 No. 514 <http://cbd.minjust.gov.kg/act/properties/ru-ru/90181/10>
- Resolution of the Government of the Kyrgyz Republic "On Approval of Standard Rules for Construction, Land Use and Improvement of Residential Areas of the Kyrgyz Republic" dated September 19, 2009 No. 597 <http://cbd.minjust.gov.kg/act/properties/ru-ru/90256/10>
- Resolution of the Government of the Kyrgyz Republic "On Approving Regulations on Issuing Documents for Design, Construction and Other Changes of Real Estate and Assessment of Conformity of Completed Facilities to be put into Operation in the Kyrgyz Republic" dated January 17, 2020 No.12. <http://cbd.minjust.gov.kg/act/view/ru-ru/157423?cl=ru-ru>
- SNIP SN KR 30-01: 2020 “Planning and Development of Cities and Urban-type Settlements» (approved by the Order of the State Agency for Architecture, Construction and Communal Services under the Government of the Kyrgyz Republic dated March 24, 2020 NLA No. 39)

Regulation of the Entrepreneurial Activity

- Tax Code of the Kyrgyz Republic dated October 17, 2008 No. 230 <http://cbd.minjust.gov.kg/act/properties/ru-ru/202445/1200>
- Law of the Kyrgyz Republic "On Customs Regulation" dated April 24, 2019 No. 52 <http://cbd.minjust.gov.kg/act/view/ru-ru/111908?cl=ru-ru>
- Law of the Kyrgyz Republic "On State Support of Small Business" dated May 25, 2007 No. 73 <http://cbd.minjust.gov.kg/act/view/ru-ru/202106>
- Law of the Kyrgyz Republic "On Licensing and Permitting System in the Kyrgyz Republic" dated October 19, 2013 No. 195 <http://cbd.minjust.gov.kg/act/view/ru-ru/205058>
- Law of the Kyrgyz Republic "On Public-Private Partnership in the Kyrgyz Republic" dated 22 February 2012 <http://cbd.minjust.gov.kg/act/view/ru-ru/111942>
- Law of the Kyrgyz Republic "On the Procedure for conducting inspections of business entities" dated May 25, 2007 No. 72 <http://cbd.minjust.gov.kg/act/properties/ru-ru/202105/140>

- Law of the Kyrgyz Republic "On the Fundamentals of Technical Regulation in the Kyrgyz Republic" dated May 22, 2004 No. 67 <http://cbd.minjust.gov.kg/act/view/ru-ru/1453>
- Law of the Kyrgyz Republic "On Ensuring Uniformity of Measurements" dated July 9, 2014 No. 118 <http://cbd.minjust.gov.kg/act/view/ru-ru/205339?cl=ru-ru>
- Law of the Kyrgyz Republic "On Natural and Permitted Monopolies in the Kyrgyz Republic" dated August 8, 2011 No. 149 <http://cbd.minjust.gov.kg/act/properties/ru-ru/203389/40>
- Law of the Kyrgyz Republic "On Investments in the Kyrgyz Republic" dated March 27, 2003 No. 66 <http://cbd.minjust.gov.kg/act/properties/ru-ru/1190/130>
- Decree of the Government of the Kyrgyz Republic "On Licensing Issues of Subsoil Use Rights" dated November 29, 2018 No. 561 <http://cbd.minjust.gov.kg/act/properties/ru-ru/12764/10>
- "Regulation on the Procedure for Determining Prices (Tariffs) for Goods (Works, Services) of Natural and Permitted Monopoly Entities" Approved by Resolution of the Government of the Kyrgyz Republic dated February 18, 2013 No. 83 <http://cbd.minjust.gov.kg/act/properties/ru-ru/94334/40>
- Decree of the Government of the Kyrgyz Republic "On Approval of the Medium-Term Tariff Policy of the Kyrgyz Republic for Electricity and Heat for 2020-2022" dated March 27, 2020 No. 188 <https://www.gov.kg/ru/npa/s/2371>
- Order of the State Agency for Regulation of Fuel and Energy Complex under the Government of the Kyrgyz Republic "On Approval of the Instruction on Application of Tariffs for Electricity and Heat" dated June 21, 2020 No. 2 <http://cbd.minjust.gov.kg/act/properties/ru-ru/200590/10>
- Order of the State Agency for Regulation of Fuel and Energy Complex under the Government of the Kyrgyz Republic "On Approval of the Methodology for Calculation of Tariffs for Electricity Released by Power Plants Generating Electricity from Renewable Energy Sources" dated August 6, 2015 No. 1 <http://cbd.minjust.gov.kg/act/properties/ru-ru/200000/50>

Civil Relations, Contract Law

Civil relations, contract law, restrictions on certain activities are quite clearly defined in the Civil Code of the KR, as are the right to own real estate and freedom of contract. In general, the permissibility of state intervention in a civil law contract or the definition of a binding contract (standard model contract) is usually related to the protection of the interests of one of the parties. In particular, the intervention, restriction and application of standard contracts is driven by the need to protect the interests of the consumer, which is one of the ways to regulate antitrust. According to the legislation, when intending to supply (sell) energy through the interconnected networks of a natural monopoly, a standard contract is mandatory. On the one hand, it gives the RES entity the right to supply (sell) energy to the grid at a set RE tariff in a guaranteed purchase volume, and on the other hand, it is an instrument of enforcement and a way of regulatory influence on the monopolist to purchase energy. This preserves the right of the parties to freedom of contract to supply at a contractual price in excess of the amount set out in the binding contract.

The Position of the National Energy Holding - 2017

"The impetus for the emergence of renewable energy facilities (hereinafter RES), which also include small hydropower plants (hereinafter SHPP), was given in 2008. At that time, the Law of the Kyrgyz Republic "On Renewable Energy Sources" was adopted. The legislator drew investors' attention to this sphere of activity by granting preferences in tariffs and guarantees for electricity sales.

The preferences include a feed-in tariff. Below is a comparative table on tariffs for purchase of electricity generated by RES facilities and its sale to end consumers:

Cost of purchasing RES electricity (water energy)	Cost of selling electricity to end-users [GARTEK Order No. 142]
4,7 KGS /kWh	0,77 - 2,16 KGS /kWh

	(average sales tariff - 1.36 KGS/kWh for 2017)
--	------------------------------------------------

In addition, the Law on RES sets tariffs for electricity generated from solar energy [13.4 KGS/kWh], biomass [6.1 KGS/kWh], wind [5.6 KGS/kWh] and land [7.5 kWh]. The legislator gave these tariffs the term "tariffs with increasing coefficients".

Sales guarantees include a so-called grace period of 8 years from the date of start-up, during which RES facilities are entitled to sell electricity with the application of increasing coefficients.

The legislator also stipulated that all electricity generated from RES, which is not consumed by the owner of the installation for his own needs and not sold to other consumers on a contractual basis, must be purchased by the largest distribution company in the administrative-territorial unit in which the RES installation is located, regardless of which electricity company's grid the RES installation is connected to.

Among other things, the legislator has guaranteed to RES facilities the priority right to sell their products during the period of the above-mentioned grace period.

At the same time, the procedure for the construction and start-up of RES facilities was not substantively regulated until March 24 2017, when the Regulation on the tender for the right to construct small hydropower plants in the Kyrgyz Republic, approved by Decree No. 175 of the Government of the Kyrgyz Republic, was adopted. Prior to 2017, the area of RES construction was regulated by the general provisions on construction of power plants in accordance with the Law of the Kyrgyz Republic "On Electricity" dated 1997.

However, numerous RES facilities have not withstood the general procedures established in the Law on Electricity of the Kyrgyz Republic, which has led to chaotic construction of RES facilities without taking into account the needs and financial capacity of the energy companies, which are burdened with the burden of purchasing electricity at increasing coefficients.

Thus, in the relationship between RES facilities and traditional energy companies (in particular, the companies that distribute electricity to end consumers) a practice has developed where tariffs for the purchase of electricity generated by RES facilities are several times higher than those of distribution companies, and the compensation of such costs becomes a personal burden on the distribution companies.

The provision of the Law of the Kyrgyz Republic "On RES", according to which compensation of additional costs of distribution companies for the purchase of electricity generated from RES should be taken into account when calculating and setting the national electricity tariff for end consumers, is not comforting in this situation. As of today, this provision of the law does not work.

"RES should serve as a backbone for the national electricity sector, not as a burden", is the opinion of the National Power Holding. For example, after buying 15.97m kWh for 65.7m KGS [of electricity generated by RES facilities in Chui Oblast], the Severelektro distribution company (which provides electricity to consumers in Chui and Talas oblasts and in Bishkek) could sell it for only 20.1m KGS, causing a loss of 45.6m KGS. The traditional energy system needs support from RES. In this case, support could be construction of RES facilities in those parts of the country, where there is no supply for objective reasons. RES should be of local nature and should independently engage in generation and distribution of generated electric power.

The practice of RES activity has shown that it requires:

1. wide scale study and definition of state policy on renewable energy development with participation of all stakeholders;
2. Suspension of the current practice of buy-out at increasing coefficients until a new RES development policy is approved.

One solution would be to order when companies within the National Energy Holding will provide electricity transit services from RES to their end-users. All this would allow RES, in effect, to become the backbone of the national energy system of the Kyrgyz Republic.

Posted by Press Service on the National Energy Holding website:
http://www.energo.gov.kg/content/articles_view/754.

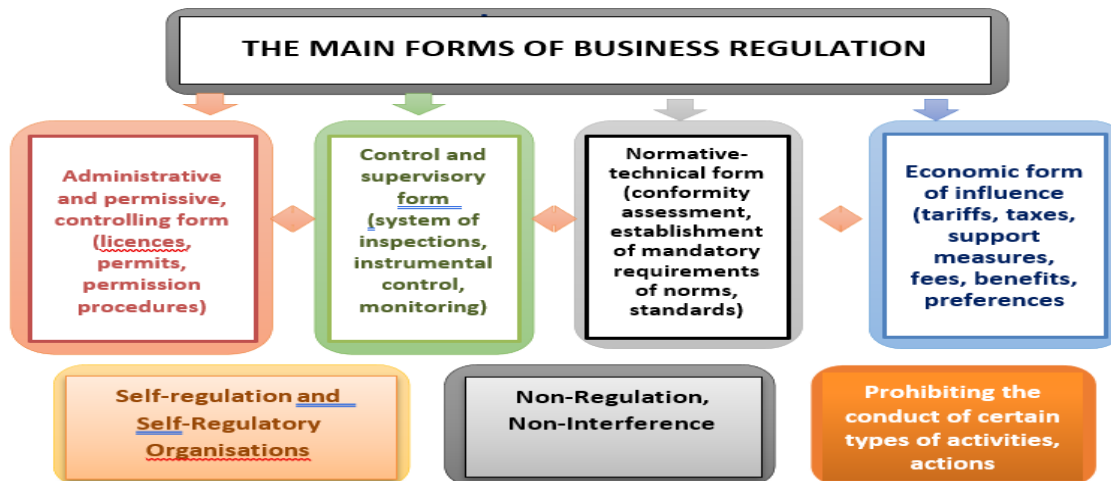
It should be noted that National Energy Holding's position stems from the economic interests of its "subsidiaries" and is related to the problem of interference in market relations through state regulation, which is based on forcing an unfavorable contract; the situation described about "chaotic construction of RES facilities" is apparently based on the assessment of relations and the situation around the three newly built mini HPPs in the entire post-Soviet period. And the regulatory document which, according to the authors, regulated the construction and start-up of RES facilities in October 2020 has been revised and abolished.

The subjects of obligatory contracts are four energy distribution companies that own regional distribution networks and supply electricity to end consumers (OJSC Severelectro, Vostokelectro, Oshelectro, Jalalabadelectro). An important fact is the lack of practices and entities supplying energy obtained from solar plants, as well as the lack of regulation of reversible supply of surplus generated RES-based energy to the networks of the above mentioned natural monopoly entities and receipt from the networks by small businesses when needed.

Nor is the practice and regulation of distribution grid transit contracts based on Lease and Assignment Agreements from RES-based small-scale generation to the consumer at a contractual price from the producer known.

The State Regulation of Entrepreneurial Activities

State regulation of entrepreneurial activities is systematized according to the areas of legislation containing regulatory issues:



There is no definition of "micro-generation" based on renewables in national legislation; the definition of energy efficiency covers both energy efficiency and energy conservation. Various NLAs define renewable energy facilities, with sectoral documents referring only to the use of hydro resources, while others simply list the types of renewable resources themselves. The establishment of criteria in the form of established capacities for the identification of non-conventional energy facilities generating (transforming) RES energy implies the introduction of special state regulation regimes and the direction of targeted state support measures for RES entities. The RES legislation provides a mechanism for regulating the volume of energy supply to the grid by quoting the installed capacity based on the territorial location of the RES facilities. The legislation introduces a special regime of relations between the subjects. The quoting is an instrument for balancing the functioning of the distribution model of the national energy system at state-regulated tariffs.

"1) electricity quotas - establishing the volume of electricity capacity of RES-based energy installations by region and by type of RES for a certain period of time, paid at the maximum end-user tariff, applying an increasing coefficient from RES-based energy installations;"

The implementation mechanisms of the RES legislation contained an unclear regulatory barrier in the form of putting out to tender a specific investment project for the construction of a small hydropower plant, were abolished by the Government on 30 October 2020 (analysis and evaluation period). However, the newly adopted document retains the right of the public authority to conduct a competitive tender for the construction of RES installations, which is essentially the same as the tender procedures. Therefore, a legitimate question arises - does tendering imply a restriction for investors or a latent tool for managing scarce resources? This method of regulation can be applied provided that none of the participants has been involved in the development of pre-design documents for a particular land plot, has not participated in land plot formation procedures, has not carried out engineering surveys or invested its own funds. Most importantly - the competition is needed only where there is competition and the initiative of several applicants for access to limited natural resources is identified and the best investment project is selected. Since more than thirty years, and since the application of such regulators, there has been only one tender-competition and only one entity receiving the right to build small hydropower plants. As is obvious to all, there is no queue of investors, which in turn indicates the absence of the production factor of entrepreneurial and investment initiative. The deterrence and manifestation of private initiative may be due to the fact that it is necessary to participate in the tender and bear the costs before obtaining the right to build, operate, sell their product for profit not related to the direct investment in the facility, technology, business.

National legislation defining the environmental safety assessment procedure (environmental impact assessment of facilities during design and construction) as well as a number of regulatory environmental requirements are not applicable to small RES facilities. Respondents and FGD participants consider the need for regulatory impact on activities to preserve the environment as a priority, and the setting of environmental requirements as a way to reduce the carbon footprint.

Land Use Regulation and the Availability of Limited Natural Resources

The repealed document did not affect the problems of access to water (hydropower) and land resources and did not change the relationship in this area of state regulation and state administration. Access to the use of water resources from surface runoff from rivers or fabricated structures requires permits and licenses for the use of underground geothermal resources. Water legislation prohibits the construction of dams, dikes, weirs in river beds and irrigation structures, while the procedures for access to water resources by MSMEs are not clearly defined. In order to locate an energy facility on lands of another category (except for the designated purpose - industrial land) it is necessary to obtain multiple permits and approvals, while certain categories of land are prohibited and these lands are usually located in places where there is a need to use them for small, micro generation for tourism. Any natural or legal person intending to build a RES facility should be granted access to the main economic resource (production factor) land plot. Either for temporary use or on the right of ownership, which by its functional purpose corresponds to - the intended use of industrial, energy land in accordance with the requirement of the land legislation.

Characteristically, the answers of the respondents were divided, with the RES Providers sector not claiming ownership of land, and the Tourism Consumers sector preferring to own a land plot. Obviously, both are confronted with a permissive system for regulating not only land use, but also construction, as the following charts show:

Figure 16: Types of land use for the production of equipment, appliances, and renewable energy generation and supply

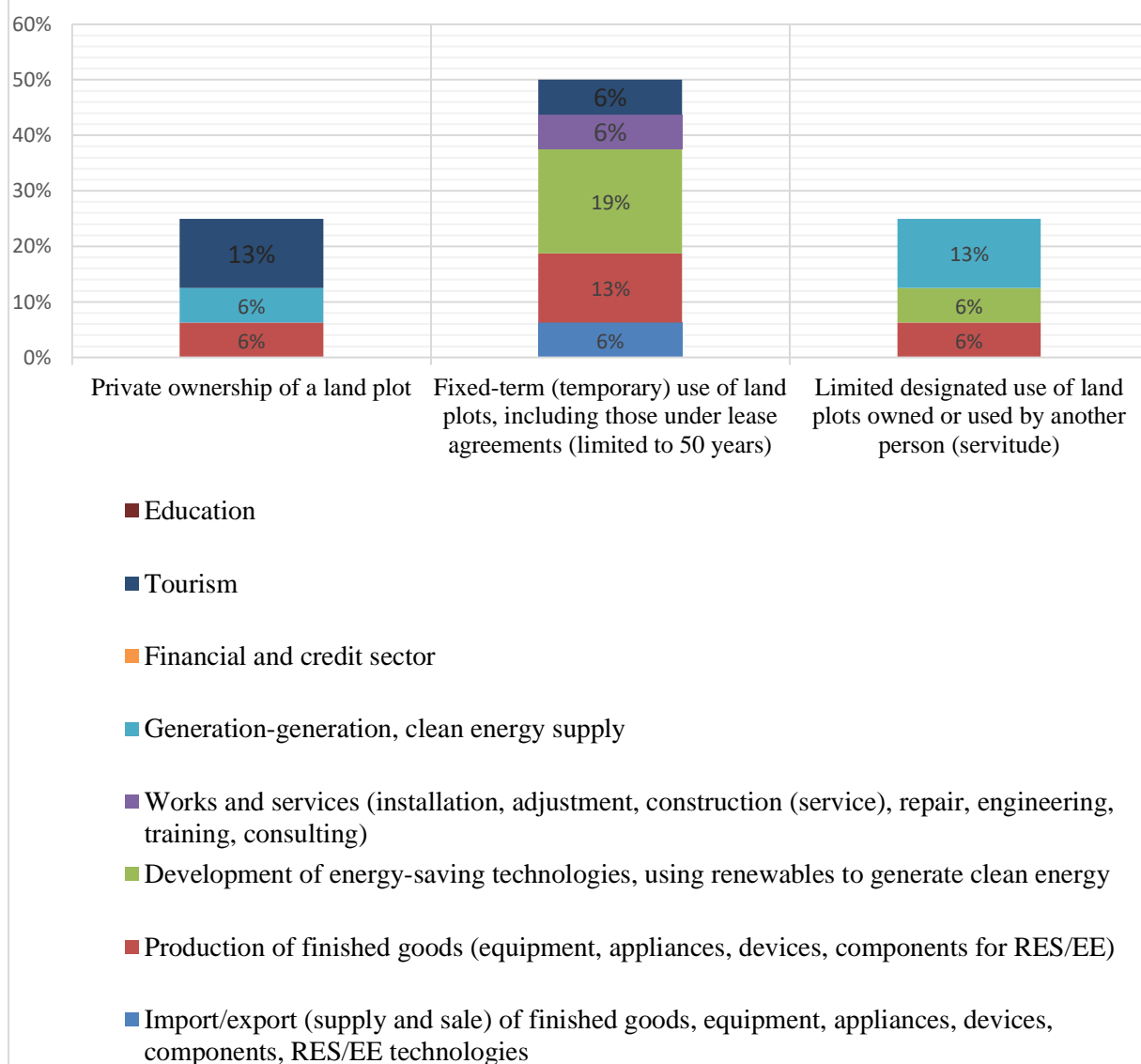
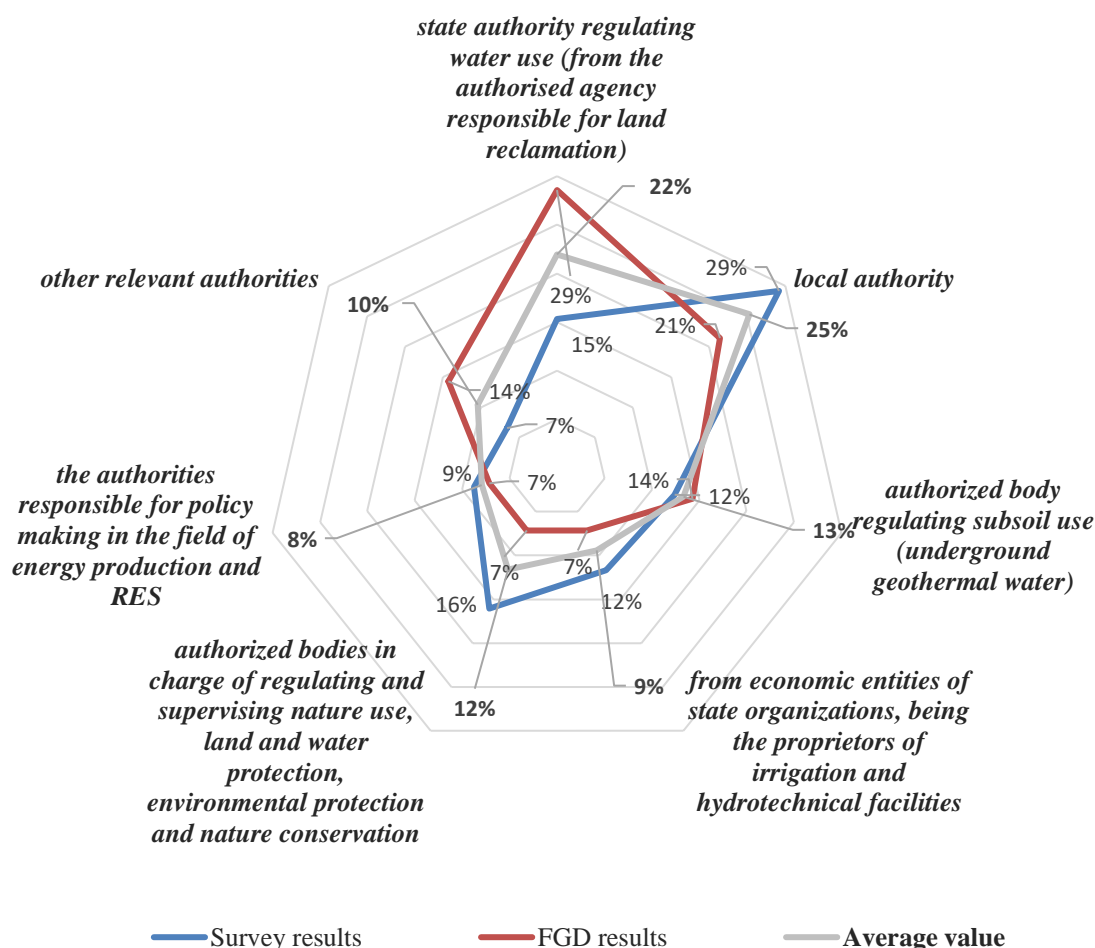


Figure 17: Difficulties in obtaining permits for the use of water, land, natural resources and by which authorities



The chart above identifies the most problematic areas of regulation based on the licensing and permit system.

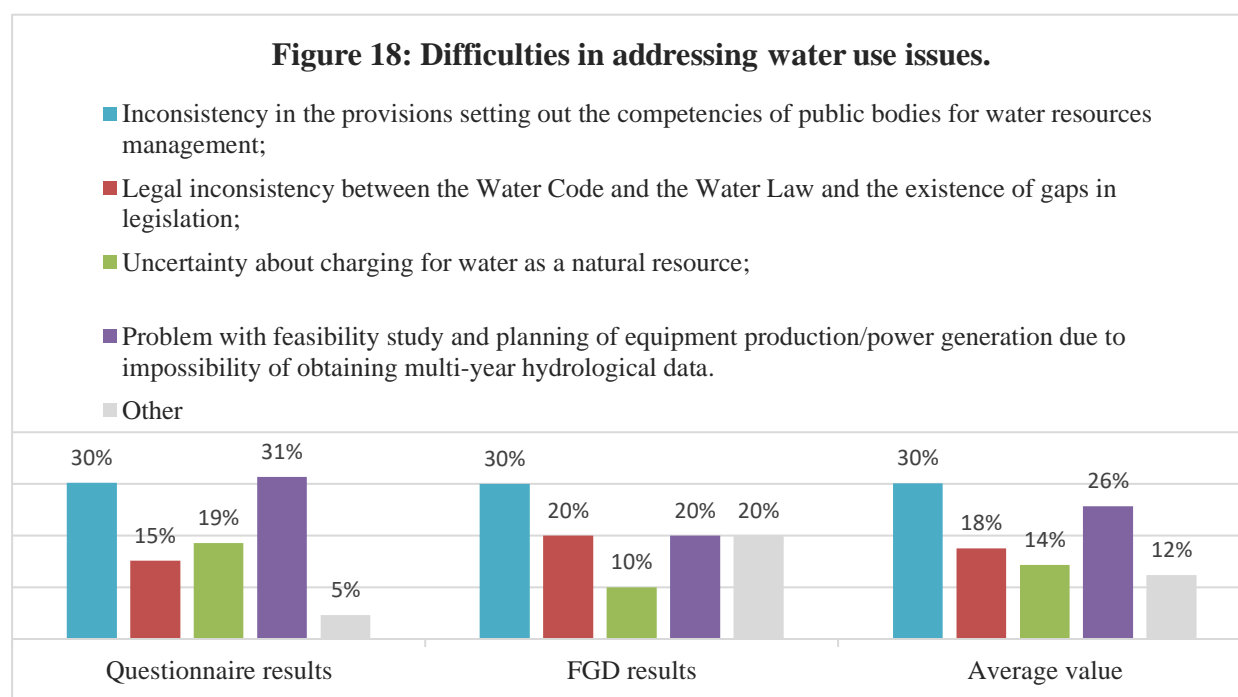
Thus land use problems are inextricably linked to technology, the higher the level of technology, the more accessible and the safer it becomes for the environment and the land resources. Technology as a factor is linked to information and in turn requires a competent human resource factor. In-house technologies do not find implementation in production, the entry of external modern Technologies is limited and there is an investment barrier for foreign companies in the form of restrictions on the right to use land (factor Land) and the legal prohibition on obtaining property rights. Thus, there is a restriction on the entry of new, different technologies into the small energy sectors.

Historical background: In the 30s of the last century, the country's industrial development policy was based on attracting technology and human resources, and this gave rise to the development of industrial production in several sectors at the same time. An example is the import of technology, equipment and qualified human resources from Czechoslovakia and the creation of legal and economic conditions for the operation of the industrial cooperative "Interhelpo", in particular the allocation of land plots. Foreign legal entities residents of Kyrgyz Republic having in the structure of founders foreign and physical entities owning not less than 20 % of share may get only the term right of land use up to 50 years (49 years), ownership of land by foreign entities is not allowed. In fact, the ban and restrictions on the right to use the main resource is a barrier to entry into the market.

There is ambiguity in the state licensing regulation for the sale of the generated energy product by generating facilities with a capacity of less than 1000 kW. The adopted decree of 30 October 2020 requires RES entities to obtain a license for the supply of electricity. A license is not required for RES-based power generation, but a license is already required for generation and sale of electricity from small hydropower plants with installed capacity above 30 MW. It should be noted that the legislation provides for a compulsory procedure for registration of subjects of activities by entering them into the Register of Renewable Energy Sources Entities and issuing a Certificate of Registration of Renewable Energy Sources Entities, which together substitutes the licensing and permitting regulatory forum. It can be argued that MSME production activities themselves are not licensed, but trading activities for the sale of surplus or total output are subject to licensing and permitting regulation, although the classification of this activity does not exactly meet the safety criteria of the licensing law.

"7) State Register of RES subjects (hereinafter referred to as the Register of RES subjects) - a unified system of state registration of all RES subjects expressing their intention and carrying out activities in the field of production, supply (sale) of RES-generated electricity;"

The regulation of land and water use is based on general uniform rules and sometimes prohibitions, with water use being regarded as water consumption. Land use and siting of small generation facilities on agricultural lands, on lands of cities and settlements is associated with a change in functional and intended use (transformation) or is simply prohibited by law. The lands of water objects belong to the water fund lands and belong to the state, but some of the irrigation objects are on the balance sheet of water associations.



Land legislation does not disclose the land use procedure for small and micro-generation facility siting, while the Water Code contains a category of land - Energy Land. It is important for further elaboration that the investor is put in a situation of choice to obtain activity permits and the right to land use. In such a situation, the subjects of tourism on the level of CBT (an area of more than 100 square meters under the energy facility is considered). Land users owned by right of occupancy within a settlement, but no right to use it for production purposes (industry, power generation). In order to change or make multi-purpose use of land outside of populated areas, the right to use the land and permission for energy production activities, which the subjects intend to sell to the grid, is required. The absurdity of the license-permit system of state regulation is that a number of permits for activities must be obtained before the right to use a land plot or a "water plot" is obtained; there are risks of not obtaining permits for land, water and subsurface use, but

before that one must already have permits for activities. The construction and commissioning of RES installations is governed by Kyrgyz urban planning legislation and regulated by the Regulations on the Procedure of Issuing Documents for Design, Construction and Other Changes to Real Estate and Assessment of Compliance of Commissioned, Completed Facilities. The document adopted this year removed the issue of permits from the regulation of construction of facilities on a particular land plot, but retained the mandatory administrative steps of The adopted regulation regulates the issuance of APU, ITU (first stage) on the basis of determining compliance with the basic urban planning documentation, i.e. in relation to cities and settlements. How to determine the architectural and planning conditions for siting of RES facilities outside settlements on land plots of various purposes remains a question.

In general, urban planning legislation regulates the construction of civil facilities based on urban planning documentation, legal zoning, and rules for the development of cities and settlements. Reduced licenses and permits as a result of the ongoing regulatory reforms have eliminated duplication, and legislation has delineated which objects belong to the system of technical regulation and what is attributed to licensing regulation of certain types of entrepreneurial activity. Difficulties in regulating the construction of industrial facilities, which include almost all types of generating (transforming RES) equipment, complex technological equipment for accumulation, transmission, placed outside the administrative territorial boundaries are caused by a combination of several forms of regulation without combining into a single process. Another regulator is the licensing of design and construction activities by the State Agency for Architecture, Construction and Housing. Thus, in order to undertake an entrepreneurial initiative to build a small energy generating facility based on RES, at least 3 licensing and permits for design and construction activities must be obtained before starting the entrepreneurial activity. If the entrepreneur decides not to use the services of licensed general contractors, subcontractors, designers.

A feasibility study must be developed for the business design, this is also necessary to justify its intentions and submit this document to the competent authorities. According to the Law of the KR "On Electricity" in Article 19 "The competent state authorities shall announce a tender for the construction of energy installations, except for large electricity production facilities and sections of the main electricity network". Entities must first invest in the development of documents, go through various procedures, take the time to register as a business entity and have the risk of not winning the tender (or) competition.

In order to determine the negative/positive impact of the whole palette of NLAs of different sectors and areas of national legislation, specific rules and regulations (NLAs), on the development of activities of the suppliers and consumers of state regulation of homogeneous business activities, an RIA is needed. Following a review of previous RIA materials and retrospective of changes for the last ten years it can be clear that no comprehensive analysis and impact assessment (RIA) of the entire palette of state regulation on different sorts of activities was conducted. According to with the legislation, the RIA is used as a tool to assess current legislation and draft NLAs. Although the KR law "On optimization of the regulatory framework for business regulation" provides for the review of the legislation every five years, it should be noted that the application of this provision was carried out only once from 2008 to 2010 and only covered the area of licensing and permitting design regulation, construction, energy, but did not affect other impacting NLAs (example: there was no impact analysis of land legislation). Adopted amendments and new NLAs were subjected to RIA point-by-point, affecting only interrelated by-laws and sectoral laws or special umbrella laws. The objective fact is the lack of evaluation of the real impact of the adopted decisions (NLA), the evaluation of the correspondence between the objectives of the introduction of the regulation and the final result. Thus, while declaring the objectives of small-scale energy development in the NLAs, the content of the NLAs adopts norms, separate provisions, which are inherently regulatory barriers and create regulatory costs, which constitute an obstacle to activities and investments.

It is necessary to define the means of regulation in the form of regulatory and technical requirements and conditions imposed on the small-scale energy object itself, starting from the design stage (business idea) to operation (energy generation) and its implementation.

Regarding the systematization of the types of permits and authorization procedures, it is proposed to further use of the term "Regulatory Barriers", distinguishing in a special type "Administrative Procedures" that a business entity must pass through.

Prerequisite - specialization of the business entity is design, construction of hydropower RES facilities, production, transmission, sales of clean energy.

Regulation of entrepreneurial activities for the production and sale of energy generated from RES, gaining access to key natural resources.		
STAGES	STEPS/ACTIONS/PROCEDURES, PERMITS, LICENCES	THE AUTHORITIES AND ORGANIZATIONS INVOLVED
Preparation stage for the implementation of investment intentions	Study the legal requirements, procedures and procedures for gaining access to key economic resources owned by the state or organizations. Obtaining information on special security requirements. Study of procedures, determination of preliminary cost of services of state bodies, organizations, amount of obligatory payments for obtaining permissive documents. Determination of the location of activities (facility location), study of encumbrances, obtaining information from owners of land and water resources, and obtaining information on climatic, hydrological, geodetic indicators and irrigation situation.	GKPEN, GARTEK, Gosstroj, Nature Conservation Agency, Water and Land Resources Agency, LSG, district RES, other organizations owned or involved in the provision of services on a non-alternative basis.
2 The design phase and preparation of documents for the siting of the energy facility.	Coordinate the initiative with the LSG (land owner) to obtain conclusions on the admissibility of the land and water plot to accommodate the hydraulic structure and engineering facility complex, initiate a change in functionality and intended use of the land plot (in case of non-compliance with the intended purpose). Independently engage an organization for land surveying works, order and pay for services for topographic, engineering land reclamation, surveys and other pre-project works on the ground.	LSGs, the Land Use Agency, organizations and licensed entities.
Land management and land tenure	The formed land plot is put up for auction. Decree of Government of the KR dated 09.10.2019 No. 535 The initiator must win the auction for the right to use the plot and conclude a lease agreement. For design and construction, it is necessary to obtain a state act for the right of land use, fixed-term 5-9 years or for 49 years, (document of title) within the clear boundaries of the land plot	

Regulation of the activities of designers	To carry out planning and surveying, design, it is necessary to have a license of the appropriate level of complexity (responsibility) which gives the right to design energy facilities. Develop a feasibility study and have it approved by the energy authority	
Regulating the construction of a property	Obtain APU, ITU for design of the property, develop design approval, determine specifications for connection and submit design for construction, environmental impact assessment. Develop design and estimate documentation. Obtain positive conclusions of state expertise - actual construction approval. (2nd stage)	Territorial bodies for architecture and construction, organizations and companies, State Environmental Protection Agency
Stage 3 Regulation of construction activities. Licensing.	In order to carry out construction and installation works it is necessary to have a license from the Gosstroy, and the licenses must correspond to the types and specialization of individual activities, taking into account the complexity (level of responsibility) of the works and the object. It is also necessary to have certified responsible specialists - individuals who have confirmed their competence with an authorized body (Gosstroy KR).	Gosstroy KR, GKPEN, GARTEK
Construction, installation works. Construction of an energy facility. Assessment of the object's conformity	In accordance with the law, facilities over 100 square meters and classified as complex industrial facilities are subject to periodic assessment of compliance with the adopted design solutions, mandatory normative and technical requirements - from the groundwork stage to the completion of all construction work. Because of such external control by an authorized agency, a document is issued certifying the object's compliance with all norms and requirements. Only then can the property be registered.	
Obtaining a license for energy generation, transmission and sale activities	In order to carry out activities in the generation, transmission and sale of electricity, licenses must be obtained from the fuel and energy regulatory authority if the capacity of the SHPP is 30 MW and above.	
Stage 4 Assessment of compliance of equipment, instruments, measurement tests for compliance	The next document is the switching and connection based on a test report (switch-on order) and based on the authorization of the persons responsible for the operation. The intermediate step is the metrological inspection of measuring instruments, metering devices, assessment of compliance with	Organizations and entities owning networks - distribution companies. Authorized body for metrological control and conformity assessment of measuring instruments.

with parameters and energy standards	standards and parameters and operational safety of the facility and equipment.	
Operation and energy production.	Concluding a contract, generating energy.	Sides.

Analysis of the Regulation of the Construction/Siting of Small and Micro Renewable Energy Generation Facilities, Local Small-Scale Energy Facilities

Keywords: *NLA, by-law, Building Code of the Kyrgyz Republic, architectural and urban planning regulation, normative and technical regulation, regulation of the design procedure for urban, urban-type and rural areas, location of facilities, zoning of areas and determination of functionality, including for re-construction.*

In March 2020, SN KR 30-01-2020" No. 39-NLA "Planning and Development of Cities and Towns" was finalised and adopted. The need to consider the norms and provisions of this document stems from the scope of the regulated relations, namely:

- The SN standards apply to the design of new towns and urban settlements and include basic requirements for their planning and development;
- This document prescribes the design of urban settlements (workers, resorts) according to the standards established for small towns based on the number of inhabitants.

The design of facilities without engineering infrastructure and industrial facilities is not allowed, but the document does not prescribe rules requiring the location of RES generation facilities to be taken into account in the design documents. All of the terminology used refers meaningfully to general utility systems, without implying the use of local micro-generation facilities.

So the definition:

"architectural documentation (architectural design): *Part of the design documentation containing architectural solutions that comprehensively take into account the social, economic, functional, engineering, technical, fire safety, sanitary-hygienic, environmental, architectural and artistic and other requirements for the facility to the extent necessary to further develop the documentation of construction projects*

displays a similar definition from the law, but does not detail that there are functional, engineering, technical requirements.

"functional zones: *Zones for which boundaries and functional designations have been defined by spatial planning documents."*

Accordingly, there will be difficulties when designing a RES energy facility to supply tourist and other properties, as the legislation provides for mandatory (non-alternative) receipt of specifications and engineering supply schemes from single grid sources when capacity is available, with the mandatory condition of matching capacity with demand. This situation firstly does not allow for additional use of land and water resources for RES-based energy generation, which in turn violates the economic logic of RES resource efficiency. It is assumed that there should be no hazardous industrial facilities on the territory of cities and towns, and the document prescribes that industrial zones should be identified in the General Plan of settlements at the stage of planning of development, i.e. territorial allocation of facilities.

"Settlement master plan: *Town-planning documentation on prospective town-planning for the development of the territories of settlements;"*

"Object master plan: Part of the project for the construction of a facility (building, structure, complex) containing a comprehensive solution to the issues of its location on the territory (land plot), laying of transport communications, engineering networks, complex landscaping, organization of economic services and other activities related to the location of the projected facility;"

However, in this definition there is not a single word defining the possibility not only to install networks, but also to locate small generation facilities based on RES, as well as units of equipment increasing the energy efficiency of heating, hot water supply, air conditioning of real estate - mini hotels and other tourist service facilities.

In order to solve the problems of formation and accounting of RES sector indicators in the territories of cities and towns, it is necessary to supplement the urban planning cadaster of RES and EE objects based on real estate passportization with integration with systems of green certification of real estate objects.

"State town-planning cadaster: unified system of quantitative and qualitative indicators, including cartographic, statistical and textual information characterizing the town-planning regulation territory according to the features of its social and legal use regime, architectural and planning parameters of buildings and structures, level of engineering and technical equipment, resource endowment and state of environment;"

The determination of the permitted use of land, in particular for the construction and siting of RES and EE facilities, is based on legal zoning and urban planning regulations:

"Urban planning (legal) zoning: Zoning of territories of populated areas in order to establish boundaries of territorial zones and urban planning regulations for use of land plots and capital construction facilities within such zones; establishment of mandatory requirements and restrictions for functional use (functional zoning), building development (construction zoning) and landscape organization (landscape zoning) of certain parts of the city;"

"Urban planning regulations: Regimes, permits, restrictions (including encumbrances, prohibitions and easements) of use of territories (land plots) and other real estate objects, as well as any permissible changes in their condition established by law;

"rules of development and land use in urban and rural settlements (hereinafter - the rules of development and land use): Normative legal acts regulating the use and construction changes of real estate through the introduction of urban planning regulations;"

The statement that "urban development resources: land, subsoil, water, air space, energy, labor, investment and other resources, as well as territories of settlements and their systems, which are integral components of the formation of human environment;" is well within the rational use of the listed natural resources, compatible with the understanding of the use of investment resources in small-scale clean energy generation facilities or use of EE technologies and equipment.

It should be noted that the definition of infrastructure includes the notion of energy facilities, engineering equipment for the provision of a settlement:

"Engineering, transport and social infrastructure: a complex of structures and communications of transport, communications, energy, water management, irrigation network, engineering equipment, as well as facilities for social and cultural services to the population, ensuring the sustainable development and functioning of settlements and inter-settlement areas;"

The document makes production areas as a separate category: accordingly, production areas are:

*“- Areas designated for industrial-business (research institutes with experimental sites and production facilities, commercial enterprises with maintenance shops, information centres with a publishing and printing department), industrial (food and light industry, instrument engineering, machine building, production of building materials), public utility and warehousing (territories of TPP, sewage treatment plants, **boiler houses, power plants, gas distribution centres, other facilities of urban engineering infrastructure**, storage facilities, car parks of mechanical cleaning machines, cemeteries), transport and engineering facilities;”*

It is clearly irrational to locate small-scale generation facilities away from the consumer and concentrate them in industrial areas; hence, the location of the properties needs to be regulated separately.

The document defines the goals of sustainable development of territories:

"Sustainable development of territories: Ensuring, when carrying out urban planning activities, safe and favorable conditions for human life, limiting the negative impact of economic and other activities on the environment and ensuring the protection and rational use of natural resources in the interests of present and future generations;"

Importantly, this approach predetermines the establishment of framework standards and the need to regulate the use of small-scale generation facilities directly on real estate. The annex to the document defines in detail the area of tourism facilities per person. There is also regulation of the area allocated for conventional energy facilities, utility infrastructure, but not for RES and EE equipment siting.

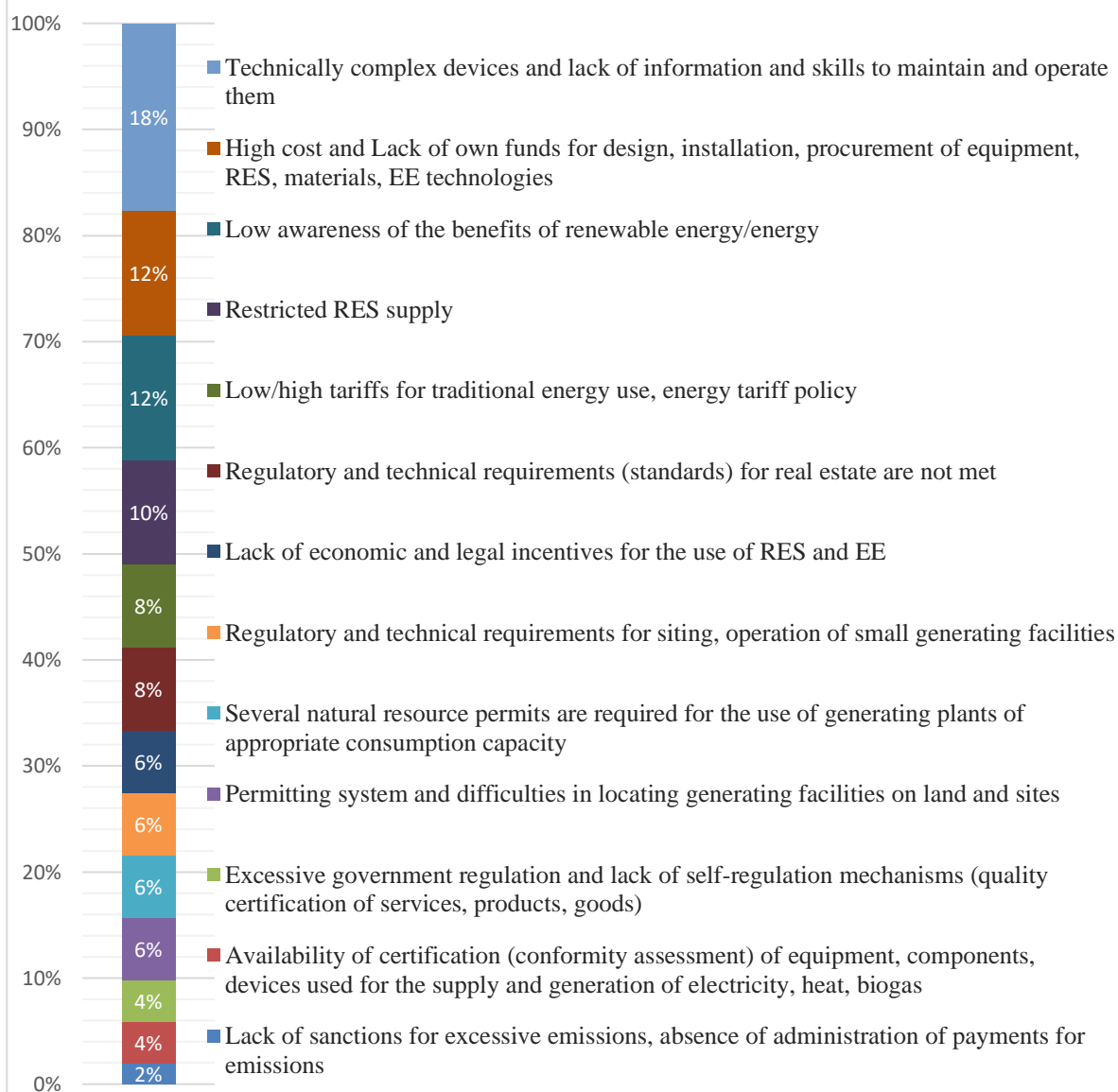
Conclusion: The addition and detailing of RE, EE facilities in this SNIP will allow the parties to be guided in the early development planning, property design stage, local area reconstruction by small energy facility standards for alternative supply to real estate.

Problems with the siting of facilities and with the use of land and water resources for energy generation, biogas and geothermal energy use are related to difficulties in overcoming administrative barriers, the multi-stage permitting system, and the involvement of specialized entities in non-business, managerial, functional and regulatory processes.

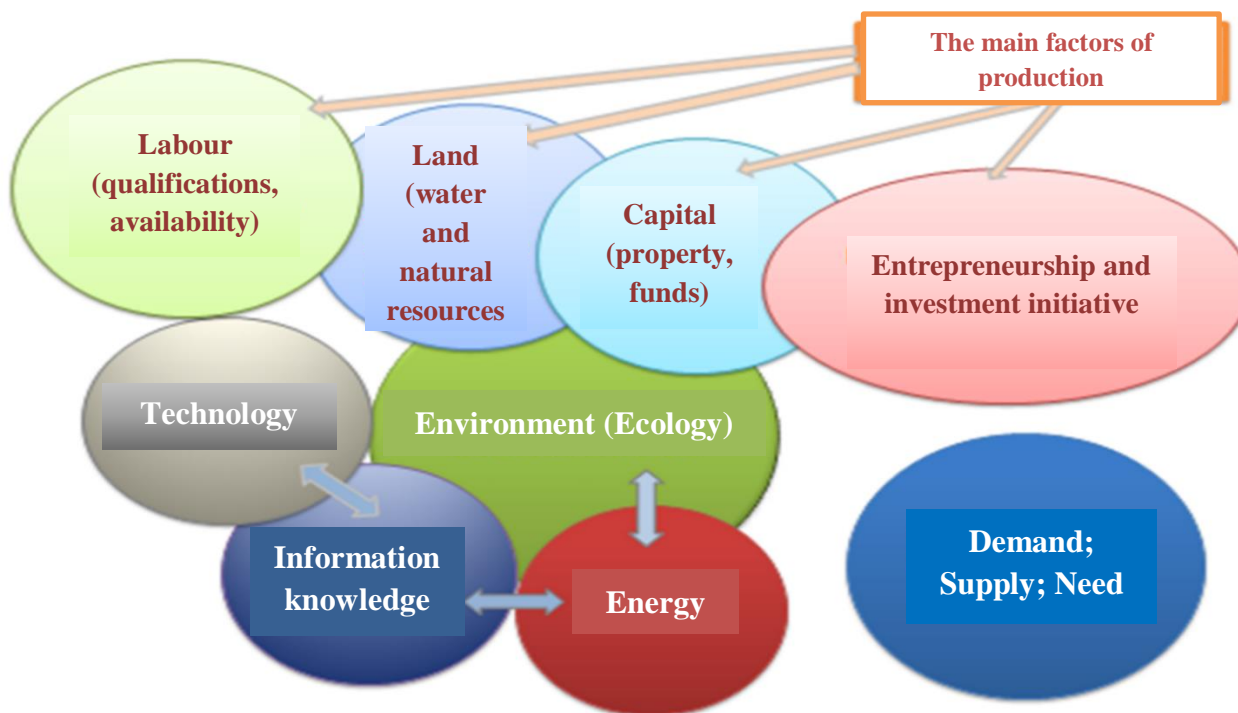
The development of distributed generation (not subsidized, such as renewables) as an independent business is constrained by the absence of an open and competitive energy market. Restrictions already constrain the business development of Suppliers, Consumers and representatives of the FCS. One obvious trend of change in the energy sector, as elsewhere in the world, is decentralization.

At the same time, in-house generation, uninterruptible power storage and automated control systems at the residential and small commercial customer level are being developed. In most cases, auxiliary power equipment in such microgrids is used inefficiently - only in backup mode - and, consequently, the cost of ownership of such equipment remains very high, which constrains its use.

Figure 19: In your opinion, what are the main barriers preventing the growth of renewable energy use in energy production, consumption?

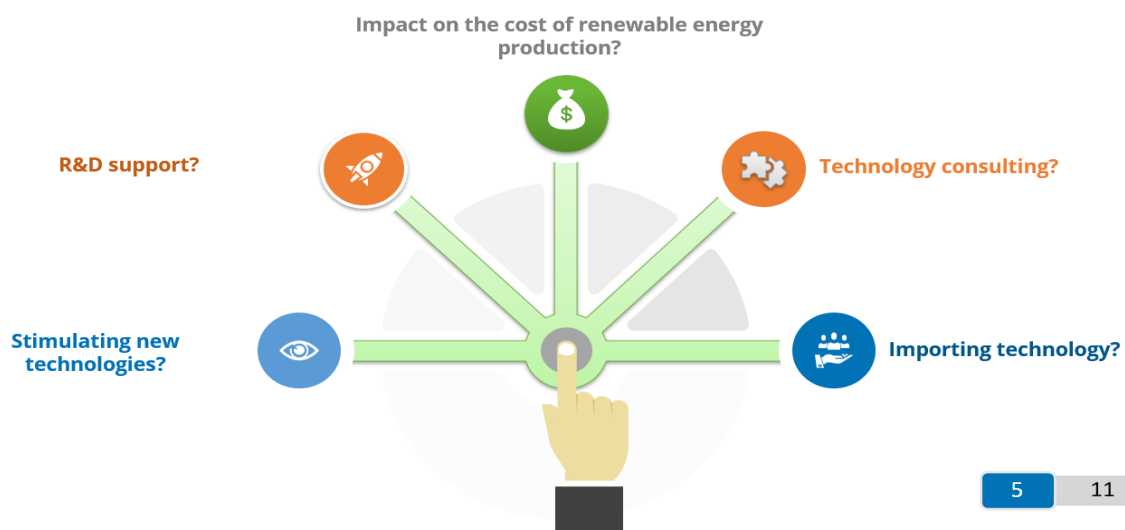


ASSESSMENT OF THE MAIN FACTORS (ECONOMIC RESOURCES REQUIRED FOR DEVELOPMENT AND GROWTH)



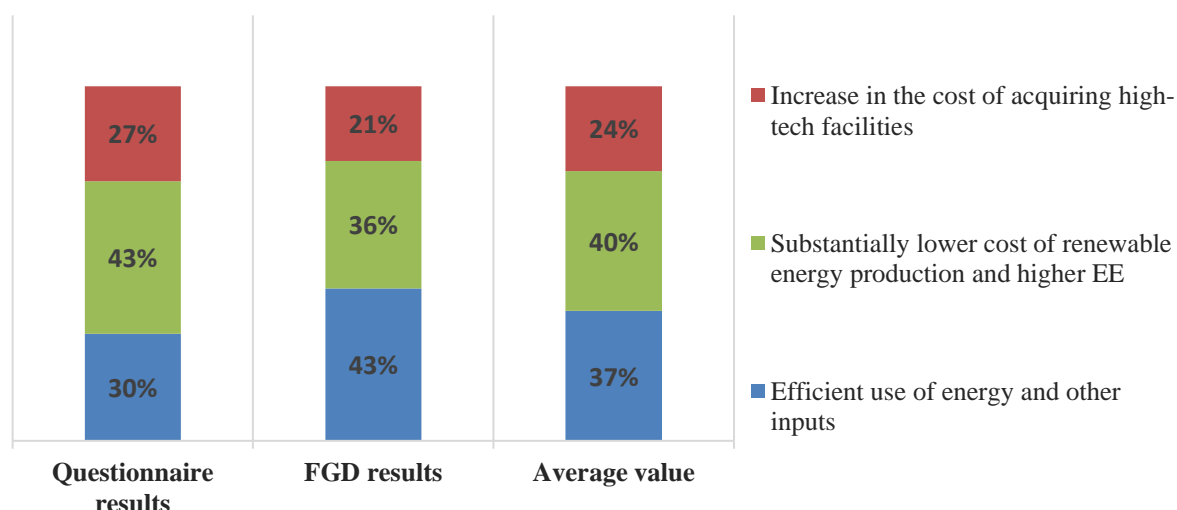
The impact of the Technology factor is considered in terms of the implementation of the norms and provisions of the Law of the KR "On State Support for Small and Medium-Sized Enterprises", which defines development support measures.

Technology as a major driver of clean energy production and consumption and EE growth



Previously, the section on land use defined the dependence and interrelation of the impact of factors of production on growth, development, while it is clear that it is not possible to influence a sectoral problem by means of state regulation of relations. This is why a number of factors of production - basic economic resources - are considered in isolation from the provisions of the regulatory legislation.

Figure 20: Impact and application of of modern RE and EE technologies on business?



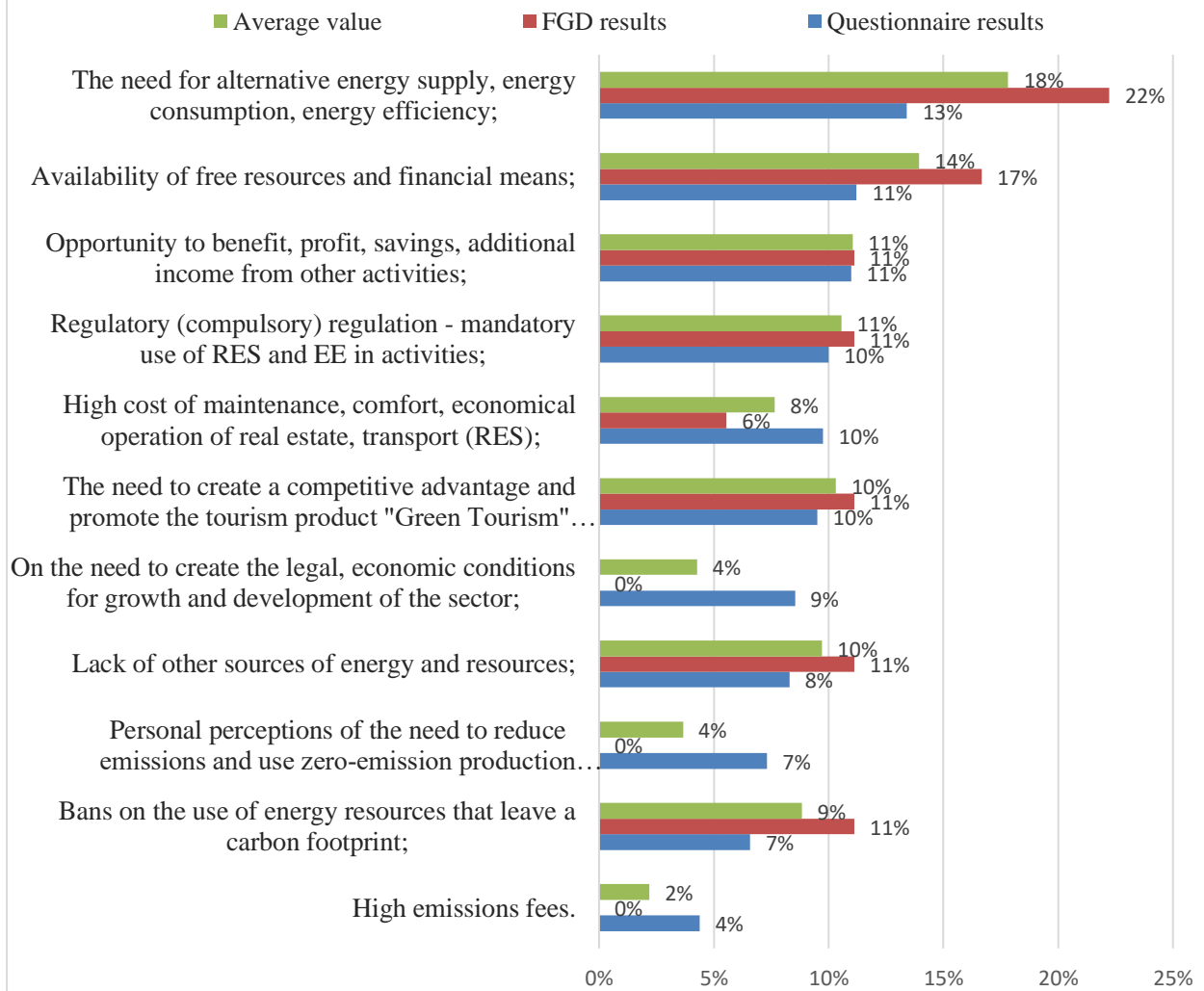
An important finding from the analysis of respondents' answers and from the survey results is the attitude of the private sector towards this factor and highlights the economic benefits derived from the use of modern technology and the benefits derived from the efficient use of other inputs and energy resources.

As a result of the discussion on the impact of the Technology factor, the following issues were substantiated:

- is the high cost of modern energy efficient technologies and affordability for MSMEs and the tourism sector;
- the lack of state support for R&D and, as a consequence, the import of technologies;
- lack of use of domestic scientific achievements and developments, and the absence of a well-developed
- lack of a well-established system for introducing technologies and underdeveloped market institutions offering such services and products;
- investors and suppliers of RES, EE are not ready to pay for the value of intellectual property as a commodity;
- lack of market intermediaries between technology developers and manufacturers of equipment, devices, materials, the narrowness of the market testifies to the absence of the RES sector infrastructure;
- underdevelopment of industrial serial production;
- technological disadvantages - need for available space for accommodation (solar, biogas), high cost of the "system" of energy storage does not allow complete switching to energy supply of individual tourism objects;
- the technological structure and technical condition of the traditional energy system does not allow the RES sector to be competitive in terms of price.

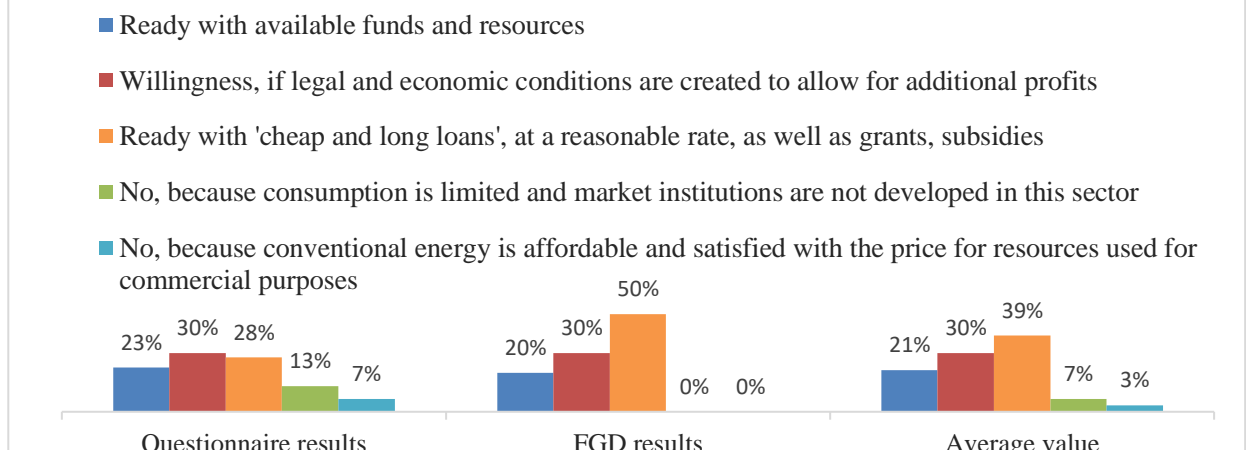
The evaluation of the Entrepreneurship and Investment Initiative factor allows several conclusions and statements to be made based on the survey and the outcome of the FGDs:

Figure 20: Emergence of entrepreneurial and investment initiatives in RES and EE based on:

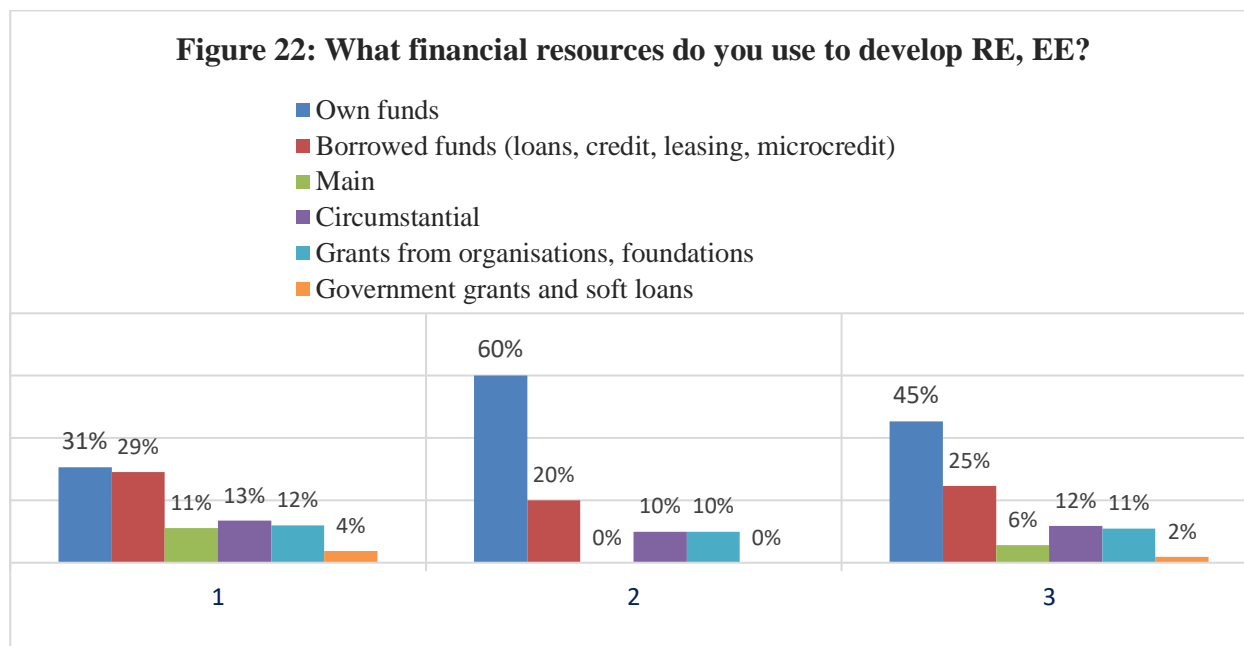


In terms of development, this situation is ruining investment and entrepreneurial initiative. The system discourages investment in the development of its own energy economy, with the centralized infrastructure lacking its own incentives and resources for technological upgrades and efficiency improvements, and consumers and suppliers, due to low levels of trust, being unwilling to pay for investments in the common energy system, considering it a cost in their core business.

Figure 21: Will entities be willing to invest in RES and EE growth and development in the near term?

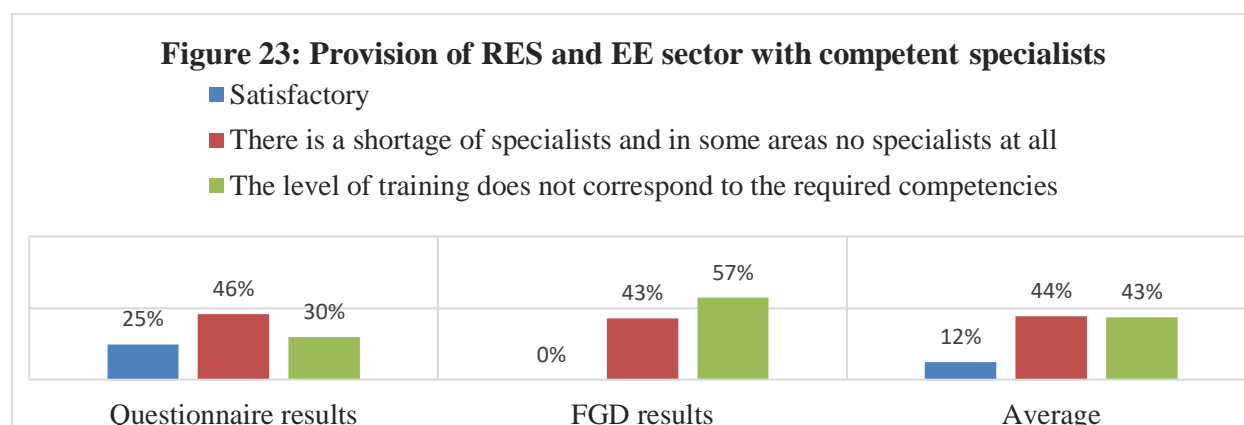


Financial resources are objectively one of the main factors of production - an economic resource necessary for the growth and development of small-scale energy, as confirmed by the survey results. At the same time, respondents indicate that they are willing to invest if economic conditions allow for profits.

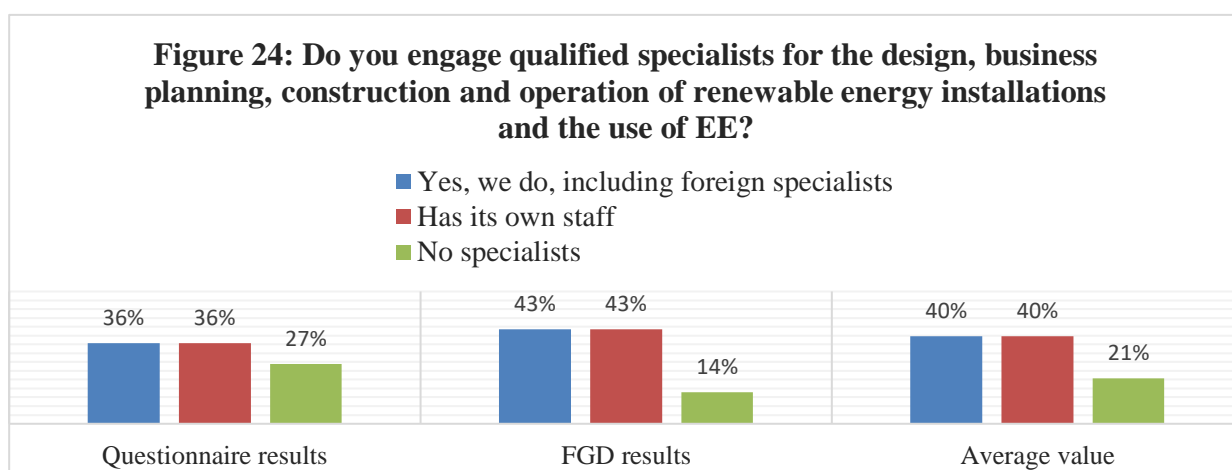


The low utilization of borrowed funds (loans) demonstrates the status and capacity of both loan offers (products) and credit needs, which confirms that a set of effective measures needs to be developed for sustainable green financing of RES, EE and EE. An objective phenomenon in all economic systems is the scarcity of available financial resources and their respective costs.

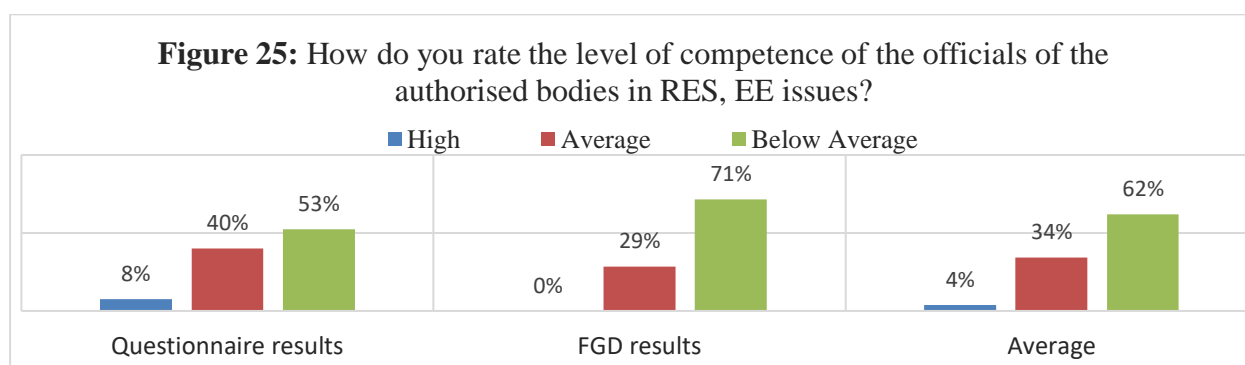
Another important factor to be considered in the development of recommendations is the labor factor, including the qualification and competence of the labor force and the entrepreneurs themselves.



The lack of specialists and their competence is a limiting factor, the implemented support measures stipulated by the Green Economy Programme and a number of other adopted documents are not sufficient. During the FGDs, a problem was identified in the preparation of training programmes in higher education institutions, while solving the problem requires a change of approach, not all private entities will be specifically trained in educational institutions.



On the one hand the problem of the sector itself is solved by hiring from outside, on the other hand participants Suppliers claim that specialists in certain areas do not exist (not available) at all.



Interesting assessment of the human resources capacity of the authorized bodies, the question of objectivity of the respondents in their answers and assessments has a place; most likely the participants substitute the determination of the level of competence of the staff they deal with in the course of their work with the level of expertise. In any event, a value more than 50% necessitates special consideration when solving this problem.