Energy

Assessment of the economic potential of the production and use of renewable energy resources of Latvia and development of policy recommendations, VPP-EM-2018/AER_1_0001

RENEWABLE ENERGY SYSTEM DYNAMICS MODEL BUILDING SESSIONS WITH STAKEHOLDERS

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1. IDENTICIATION OF STAKEHOLDERS AND ORGANISATION OF MODELLING WORKSHOPS

The analysis of the use of renewable energy sources (RES) is based on the search for technological solutions from at least 4 aspects: innovation development, financing opportunities, societal attitudes and impacts and policymaking.

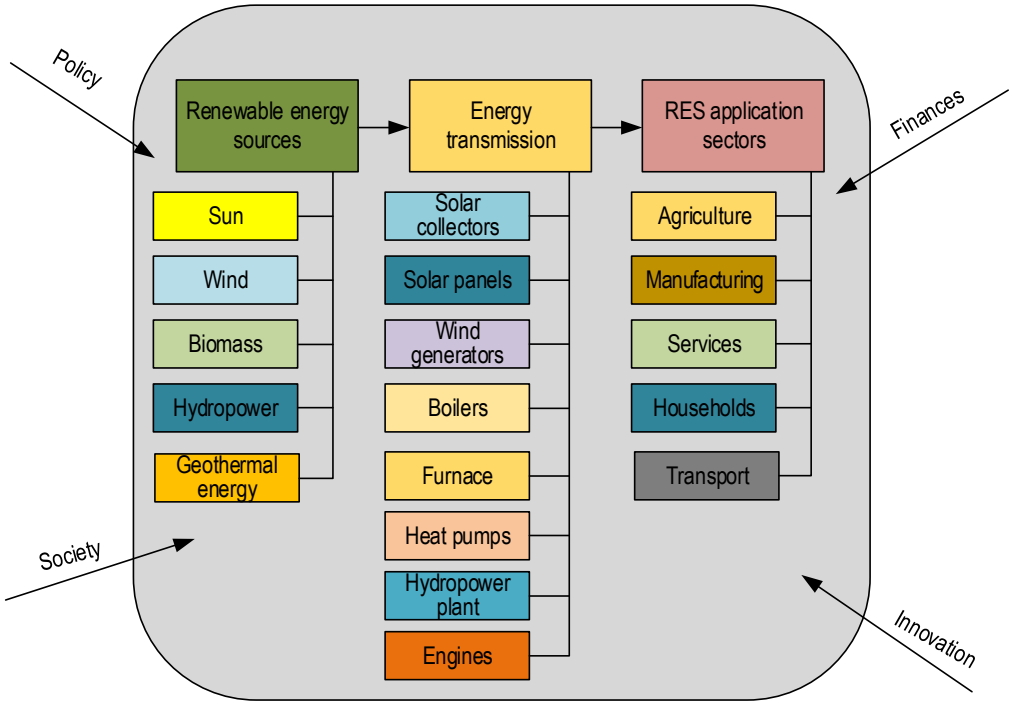

Figure 1. Aspects of the implementation of the RES

Table 1 summarises the main stakeholders in enhancing the potential of the RES. The main stakeholders in increasing the share of renewable energy resources in Latvia were identified by the highest State direct administration authorities or ministries, which have a key role to play in shaping renewable energy policy and setting long-term targets. The implementation of the RES policy is ensured by a variety of national direct management sub-entities, which monitor both the various environmental aspects related to the deployment of RES technologies, supervise the energy market, and ensure the distribution of funding for the various implementation of RES technology installation projects, as well as other functions directly or indirectly related to the implementation of the RES policy. Local authorities – municipalities and planning regions – have a key role to play in implementing RES policies, which can directly influence the deployment or non-deployment of RES technologies through their own policies and investment sharing. Central heat and electricity producers, who can choose to invest in these technologies, as well as electricity market participants, public traders, and transmission operators, which influence the provision of renewable electricity transmission, also play an important role in the deployment of the RES. To be able to install RES technologies, they would be more accessible, more efficient, technology traders, distributors and designs have a key role to play, the experience of which has a significant impact on the continuous and sustainable functioning of technology. Various RES associations provide specific lobbyists, minimising and informing the barriers. Research and science institutions also play a key role in the development of innovative solutions and technology transfer.

Table 1.

Identified stakeholders, their interests, and examples of organisations

Type of stakeholder	Interests/ impacts	Example of the stakeholder
Superior state direct administration institutions	Development of national policy of renewable energy resources, determination of long-term goals	Ministry of Economics, Ministry of Finance, Ministry of Agriculture, Ministry of Environmental Protection and Regional Development, Ministry of Transport etc.
Institutions subordinate to the state direct administration	Implementation of the national policy of renewable energy resources, distribution of financing	Investment and Development Agency of Latvia, Central Finance and Contracting Agency, Cross-Sectoral Coordination Centre, The Public Utilities Commission, State Environmental Service, Environmental Investment Fund etc.
Local management institutions	Implementation of the national policy of renewable energy resources at the local level, determination of local goals	Municipalities, planning regions administrations, Latvian Association of Local and Regional Governments etc.
Centralised thermal energy producers	Heat supply with lower costs and higher efficiency, choice of heat source and technologies	Rīgas siltums, Daugavpils siltumtikli, Salaspils siltums, Liepajas energija, etc., Latvian Association of Heat Supply Companies etc.
Electricity generators, traders and transmission operators	Electricity generation and supply at lower costs, choice of technology for electricity generation	Latvenergo, SIA "AJ Power", Sadales tīkls, Augstpriegumu tīkls, SIA "Eolus", Enefit, Fortum etc.
Technology manufacturers, distributors, dealers and designers	Installation and trade of renewable energy technologies	FILTER Latvia, SIA Netcontrol, SIA Adven, SIA SLO Latvia etc.
Renewable Energy Associations	Increasing the share of specific renewable energy sources and reducing barriers	Latvian Biogas Association, Solar Energy Industries Association, Wind Energy Association etc.
Research and scientific institutions	Research and development of renewable energy technologies	Riga Technical University, Rezekne Academy of Technologies, Rīga Stradiņš University, Latvian State Institute of Wood Chemistry etc.

To be able to fully and comprehensively assess barriers and policies for the wider use of RES, several different workshops were organised, according to their purpose and content, with the participation of Latvian energy, renewable energy, climate and energy efficiency experts, as well as representatives of the sectors associated with RES and energy efficiency.

1.1. First expert workshop

On 21 March 2019, a workshop of experts on renewable energy resources was organised at the premises of the Riga Technical University Institute of Energy Systems and Environment (Figure 1.2).

The methodology for organising the first renewable energy specialist and expert workshop is illustrated in Figure 1.1.

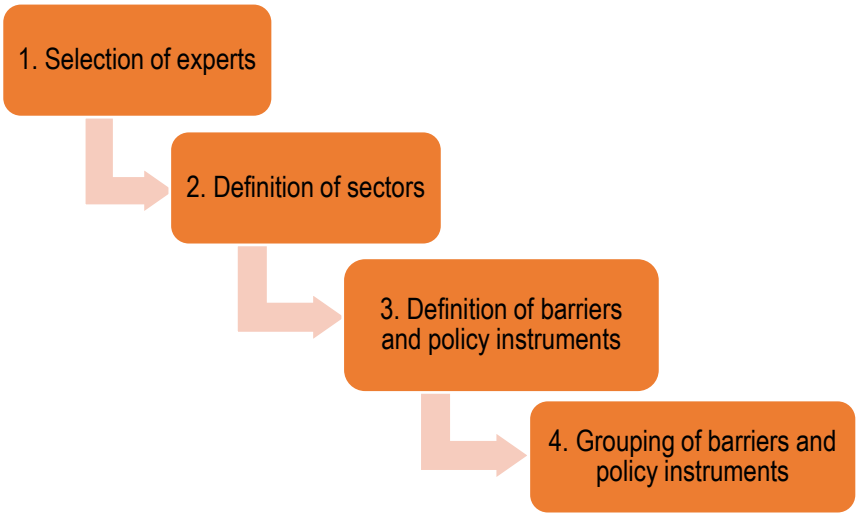

Figure 1.1. Method algorithm for organizing the first workshop

Methodology Module 1 included a thorough selection of RES experts with experience in companies, public authorities, consultative business, and science. Module 2 focused on the selection of the relevant sectors of the economy, the areas for the extraction and use of RES. Modules 3 and 4 were implemented at the workshop when the experts received the task and performed it.

The discussion discussed the barriers and restrictions on the implementation of the RES implementation measures and policy instruments that would allow the identified barriers to be successfully overcome. Experts were asked to identify, without prior preparation, the main barriers for the deployment of RES in a free manner, by grouping them into RES user sector segments.

Figure 1.2. Photos from the expert workshop

The workshop identified the specific sectors of renewable energy in the context of which both barriers and policy instruments were addressed:

1. Household sector;
2. The industrial sector;
3. Public (State and local government) sector;
4. The services (sometimes called tertiary or commercial) sector;
5. The transport sector;
6. Energy sector.

Such sectoral breakdowns were designed to allow for a more accurate definition of the restrictions on the deployment of RES and to define solutions for how to overcome them. To carry out this task, the experts answered the following questions:

1) What are the most typical barriers for each sector?
2) What are the impacts of these barriers?
3) What policy instruments are best suited for preventing or overcoming barriers in each sector?

At the same time, RES sources and technologies were identified:

A. Renewable energy sources:

a. sun;
b. wind;
c. biomass;
d. biogas;
e. geothermal waters;
f. hydro power;
g. hydrogen;
h. local resource — peat;

B. Technology for the extraction and use of renewable energy sources:

a. Burning technologies;
b. turbines: steam, gas, wind;
c. generators: syngas generators;

d. cogeneration plants: micro-generation, small, medium and large-capacity cogeneration;
e. solar panels;
f. solar collectors;
g. storage facilities: storage tanks, phase transition materials, electricity accumulation;
h. reactors: biogas reactors;
i. heat exchangers;
j. heat pumps;
k. electric vehicles;
l. biofuel technologies;
m. bikes.

Defined barriers to the deployment of RES and their extraction and use technologies and identified policy instruments that need to be developed to overcome the defined barriers, constraints and barriers.

1.2. Second expert workshop

On 2 April 2019, in the open workshop of the Institute of Energy Systems and Environment of the Riga Technical University Faculty of Electrical and Environmental Engineering on barriers and policy instruments for the procurement and use of RES, where a wider range of experts and related industries were present, confirmed and supplemented the conclusion of the previous workshop (Figure 1.4). The methodology algorithm for the second RES expert workshop is illustrated in Figure 1.3.

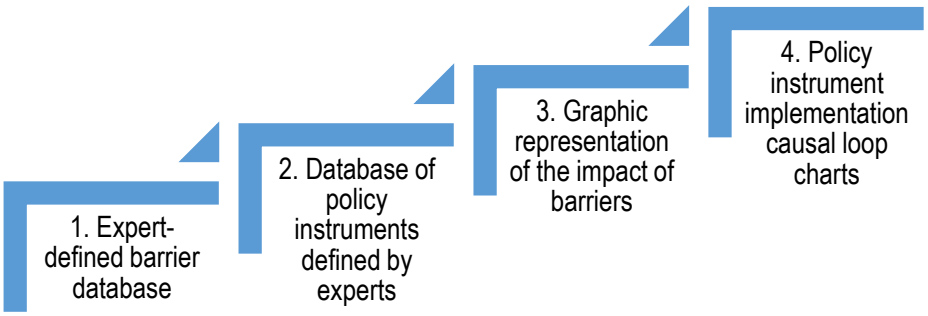

Figure 1.3. Workshop implementation methodology algorithm

The database created by the first RES expert workshop resulted in research directions and assignment of tasks to the expert working groups of the second workshop. Together, different barriers were identified across all identified sectors of RES users (households, transport, public, industrial, services and energy production), some of which are matched or overlapped.

Figure 1.4. Photos from the expert workshop

Additional barriers that apply equally to several or all sectors were also identified. A detailed inventory of the barriers and the impact of the barriers, as well as the policy instruments that can address identified barriers, are summarised in the following chapters.

1.3. Remote local government representative workshop

On 4 December 2020, a modelling workshop for municipalities in the Kurzeme region was organised in cooperation with the “Development of sustainable and renewable transport policy in Latvia (4muLATe)” to present the results of the system dynamics model in the Kurzeme region, to receive backlinks with regional municipalities and to identify the main directions for verifying and improving the system dynamics model, identifying RES barriers at the municipal level and looking for a solution to raise RES in the transport sector.

Representatives of Kuldiga municipality institution "Kuldiga Development Agency" participated in this workshop, as well as the municipalities of Skrunda municipality, the municipality of Liepaja City, Liepajas city-building board, Aizpute municipality, Liepaja city municipality Development Board, Grobina municipality, Talsu municipality, participated in this workshop. municipalities SIA “Ventspils Siltums”, Ventspils City Council, Jelgava city municipalities, Latvian Association of Selling Companies, Kurzeme Planning Region.

Representatives from Kuldiga municipality institution "Kuldiga Development Agency", Skrunda municipality, Liepaja city municipality, Liepaja city construction board, Aizpute municipality council, Liepaja city municipality Development board, Grobina municipality council, Talsi municipality, municipalities SIA "Ventspils siltums" participated in this workshop, Ventspils city council, Jelgava city municipality, Latvian Association of Heat Supply Companies, Kurzeme Planning Region.

1.4. Discussions and comments in remote seminars

In an indirect way, the views of stakeholders in the implementation of the project, the development of the dynamic model and the development of policy recommendations are taken

into account through comments, issues and recommendations in remote seminars organised by the project.

On June 5, 2020, more than 90 participants from various companies/organisations participated in the online seminar “Green Deal in the Context of Latvia’s Renewable Energy Sources”, such as Adven, Ministry of Economics, Ministry of Finance, Fortum, Latvenergo, Latvian Biogas Association, Investment and Development Agency of Latvia, Latvian Association of Local and Regional Governments, the University of Latvia and its Institute of Solid State Physics, Latvian State Institute of Wood Chemistry, Cross-Sectoral Coordination Centre, Rigas Siltums, Ministry of Transport, State Environmental Service, Ministry of Environmental Protection and Regional Development, Ministry of Agriculture and many others organisations.

On October 27, 2020, the online seminar “Renewable energy sources in smart energy systems. Opportunities and Challenges” was attended by 137 participants from such organizations as AJ Power, Bureau Veritas Latvia, Ministry of Economics, FILTER Latvia, Ministry of Finance, Jelgava city council, Jekabpils city municipality, Latvenergo, Latvian Investment and Development Agency, Latvian Association of Local and Regional Governments, University of Latvia, Liepajas energija, Latvian Association of Heating Companies, Marupe district council, Cross-Sectoral Coordination Centre, Rezekne Academy of Technologies, Rigas Siltums, Rigas Stradins University, The Public Utilities Commission, Sadales tikls, Salaspils Siltums, State Environmental Service, Ministry of Environmental Protection and Regional Development, Latvian Environmental Investment Fund, Ministry of Agriculture, EOLUS, etc.

During the online workshops, all participants had the opportunity to comment on the results presented by project promoters. All comments submitted were collected and, if applicable, taken into account in the implementation of the project. At the end of the two online workshops, a survey was organised on various issues relevant to the implementation of the RES, on which participants were able to give their assessment. The results were pooled and used for project implementation.

2. IDENTIFICATION AND USE OF RENEWABLE ENERGY BARRIERS IN MODELLING

2.1. Results of the first expert workshop

Members of the First Renewable Energy Expert Workshop identified barriers to the deployment of renewable energy sources in the energy and transport sector and policy instruments that could reduce these barriers and constraints, thereby increasing the use of RES.

The expert-defined barriers to the increase in the share of RES include:

- Manufacture and distribution of biomethane:
  - High capital costs not currently compensated;
  - No regulation for the introduction of biomethane into the network.
- Using Biomethane:
  - Favourable if the price of natural gas and petroleum products is high;
  - Insufficient infrastructure.
- Wind power plants:
  - Restrictions/barriers should be reduced (spatial planning, other requirements) but the introduction should be encouraged without State aid (market principles);
  - The very large impact of citizens' views on the construction of wind stations.
- There is no link to public financial support with specific RES targets for energy producers, national priority RES technologies selected on the basis of technically economic and environmental impact assessments.
- There is no support for investments in micro-generation/dispensed production and for connecting their facilities to the network.
- There is no support for RES investment.
- There is a lack of a fair net accounting system to promote micro-generation.
- No support for households when using a RES.
- There is no support for energy communities, including helping to address legal issues.
- Lack of support for the installation and registration of electric vehicles.
- RES is not a priority in public transport procurement.
- There is a lack of subsidies for electric vehicles.
- The user doesn't care what resource to use if the energy price is the same.
- The methodology for calculating the tariffs of the existing district heating system does not contribute to the development of companies and to the use of RES.
- There is a lack of investment support to produce 2nd and 3rd generation biofuels.
- Regulatory enactments do not require minimum energy resource efficiency indicators.
- State financial support is not intended to support investment in households investing in the use of RES.
- The country does not protect RES technology users from poor quality or technology suppliers.
- There is a lack of incentives in the household sector for certain categories of users/producers to pay off in terms of network input.
- The State needs to devote more resources to information campaigns on the use of RES addressed to households.
- State policy does not encourage the formation of energy co-operatives.
- There are no major chains in policy planning in the country: the goal of the individual -> the goal of the community -> the goal of the institution -> the goal of the local government -> the goal of the country.

- Cyclists are the most vulnerable players in the transport system.

Workshop participants identified a series of policy tools to help remove the above-mentioned barriers. They are shown in Fig. 2.1, Fig. 2.2, and Fig. 2.3.

BIOGAS

- Assessment of the introduction of biogas and synthetic gas into the natural gas transmission/distribution network.

HES and GEOTHERMAL ENERGY

- Assessment of hydrostorage capabilities (at large HES);
- Reduction of VAT on electricity for users using heat pumps.

BIOMASS

- Establishing an information system for industrial products produced using only RES;
- Investment aid for biomass technologies (by mapping out support scenarios and their impacts);
- Reduce the tax on natural resources for biomass plants when using low quality chips;
- Support programmes for the modernisation of heat systems with a view to facilitating the transition to generation 4 district heating (e.g. EU funds).

WIND

- Annual implementation volumes (allowances) (MW) should be established;
- Reduce real estate tax on buildings and properties situated within a certain radius of the wind power plant by building wind power plants on land.

SUN

- Provide support/discount for connection to the network for industrial consumers installing solar PV, e.g. 20% investment or decrease real estate tax;
- Provide investment aid to industrial solar PV projects proportionally to the stated volume target (MW).

Figure 2.1. Renewable Energy Policy Instruments

NATURAL GAS

- Raise the CO_2 rate for fossil fuels, in line with the polluter pays principle;
- Progressive excise duty on natural gas – lifting excise duty at times natural gas price falls.

PETROLEUM PRODUCTS

- Progressive excise duty on diesel used in transport.
- Cancel all discounts on fossil fuels in energy, special economic zones, ships, etc.
- Fossil fuels do not receive government subsidies but receive when biofuels are used.
- Application of full excise duty on private fuels imported from Russia and Belarus.
- Abolition of excise duty allowance on fuel used in agricultural transport.

Figure 2.2. Policy instruments for the mitigation of the role of fossil fuels

- **Use of the premium system for targeted support for specific RES under clear conditions for the termination of aid.**

- **Technologically selective support for RES, increased support for priority RES (resources, technology).**
- **A system of green certificates to stimulate RES.**
- **Obligation on traders to sell a certain % of green electricity.**
- **Limited tax breaks for those investing in micro-generation.**
- **Energy sector involvement in the provision of RES capacity.**
- **Support for connecting micro-generation/dispensed production facilities to the network.**
- **Investment aid for micro-generation (wind, sun (PV and collectors)).**
- **A fair net accounting system for promoting micro-generation (dispelled generation of self-consumption incentives). Producer-consumer support.**
- **Reduced real estate tax for households using RES.**
- **Support to energy communities, including helping to address legal issues.**
- **Support for the installation of electric car charging devices.**
- **Zero rate for electric car registration (so-called Norwegian model).**
- **The requirement to use/include the possibility of using RES in public transport procurement (in the example of Sweden, 25%).**
- **Subsidy for the purchase of zero-emission vehicles over a period of several years (at least 5 years).**
- **Diversification of tariffs depending on the resource used, because the user does not care about what resource to use when the energy price is the same.**
- **Introduction of the benchmark in district heating.**
- **Investment aid to produce 2nd and 3rd generation biofuels.**
- **To introduce minimum energy efficiency indicators into legislation.**
- **Limits on new projects/renovation projects for developing certain resources – support for RES.**
- **Investment aid for households investing in the use of RES.**
- **Financial support to compensate households for costs of inconveniences in the event of the installation of RES systems.**
- **State-created/maintained database with certified/high-quality RES technology suppliers or standard contracts for the installation of RES technologies to reduce poor quality cases and disappointments due to poor quality.**
- **In the household sector, incentives for certain categories of users/producers to pay off in the network.**
- **Household info campaigns on the use of RES.**
- **Structural measures: mandatory RES and energy efficiency targets for municipalities.**
- **A complex programme to support the development of energy co-operatives.**
- **Development of CO_2 capture programmes in municipalities (planting of trees, etc.).**
- **Respect for the principle of subsidiarity: the goal of the individual -> the goal of the community -> the goal of the institution -> the goal of the municipality -> the national goal**
- **90% subsidies for the purchase of bicycles to stimulate their use in private road transport, particularly in the urban environment.**
- **Velomobility programmes in all municipalities.**
- **Electrical mobility support – abolition of VAT on vehicles.**

Figure 2.3. Other sector policy instruments

Two databases were created after the first workshop:

- A barrier database;
- Policy Instrument Database.

After the workshop, the results were analysed, processed, and aggregated by sector segments or other characteristics to assess policy instruments:

- 19 policy instruments defined for the transport sector to promote RES (see Figure 2.4)
- 5 policy instruments defined for the household sector for the promotion of RES (see Figure 2.5)
- 18 policy instruments defined for the public sector to promote RES (see Figure 2.6)
- 7 policy instruments defined for the industrial sector to promote RES (see Figure 2.7)
- 10 policy instruments defined for the energy sector to promote RES (see Figure 2.8)

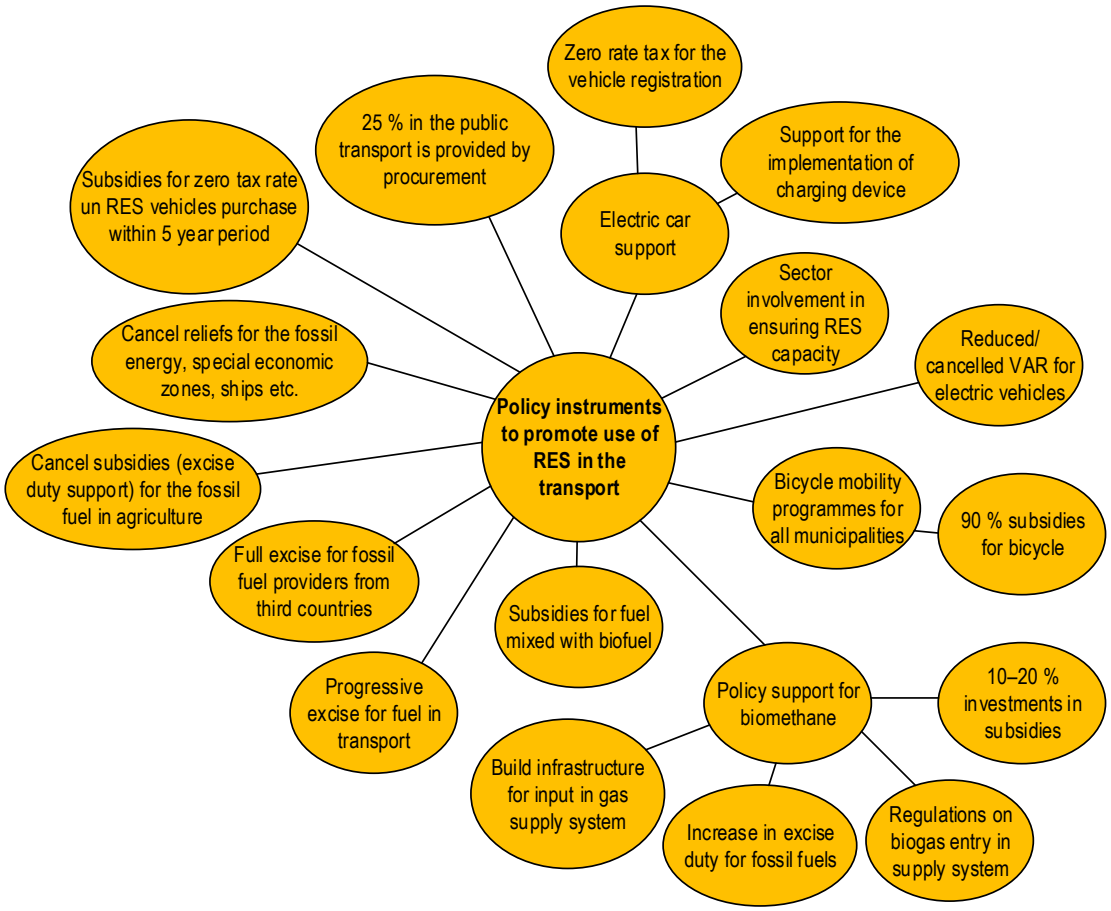

Figure 2.4. Policy instruments for promoting RES in the transport sector

The transport sector needs different policy instruments for the deployment of RES, as the transport sector currently has the lowest share of the use of RES. The use of energy resources in the transport sector needs to change, but this will be difficult without additional measures at the national level.

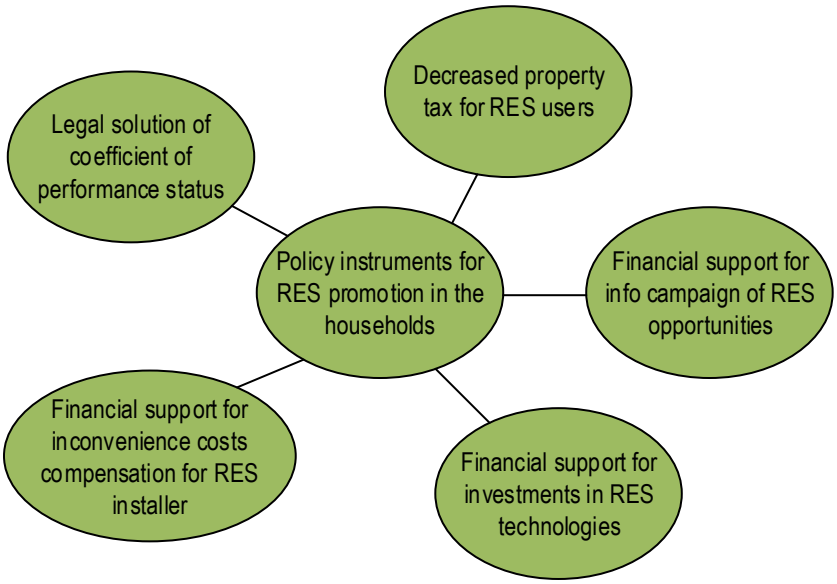

Figure 2.5. Policy instruments for promoting RES in the household sector

The household sector is different from the transport sector, with the fact that the RES is already well integrated into it. However, there are a few areas where policy instruments could help to raise the share of RES, such as raising the level of knowledge through information campaigns.

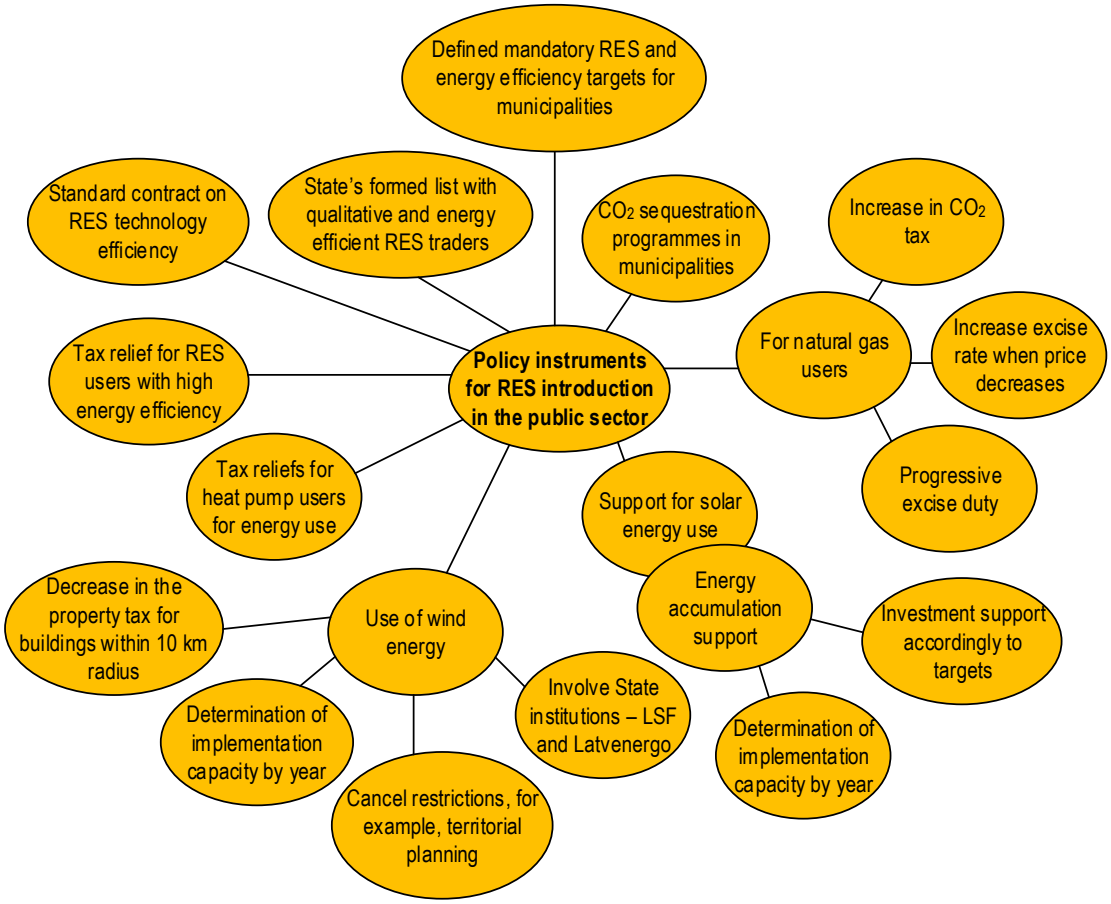

Figure 2.6. Policy instruments for promoting RES in the public sector

Much has been done in the public sector and much needs to be done to make use of the whole wide range of RES in municipalities. The increase in the share of solar and wind energy needs to be more rapid than it is at present. Municipalities have many opportunities to inform citizens and encourage CO_2-neutral environments.

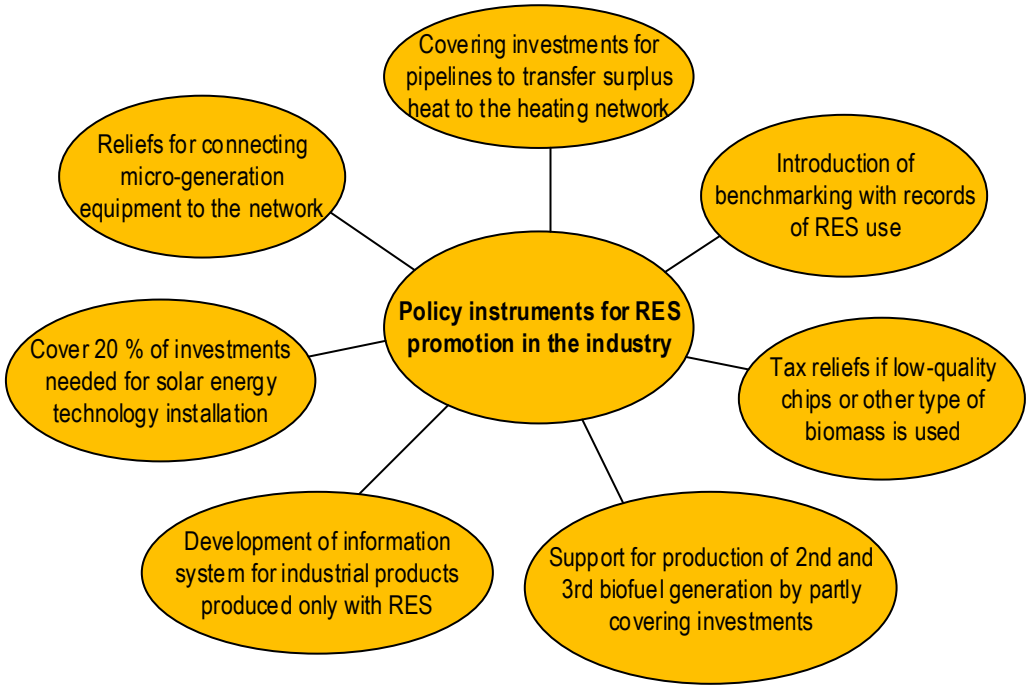

Figure 2.7. Policy instruments for promoting RES in the industrial sector

The industrial sector has high and untapped potential for RES, such as the use of solar energy during the summer to ensure industrial processes. This potential requires targeted support instruments, together with educational campaigns for the efficient use of RES in the industrial sector.

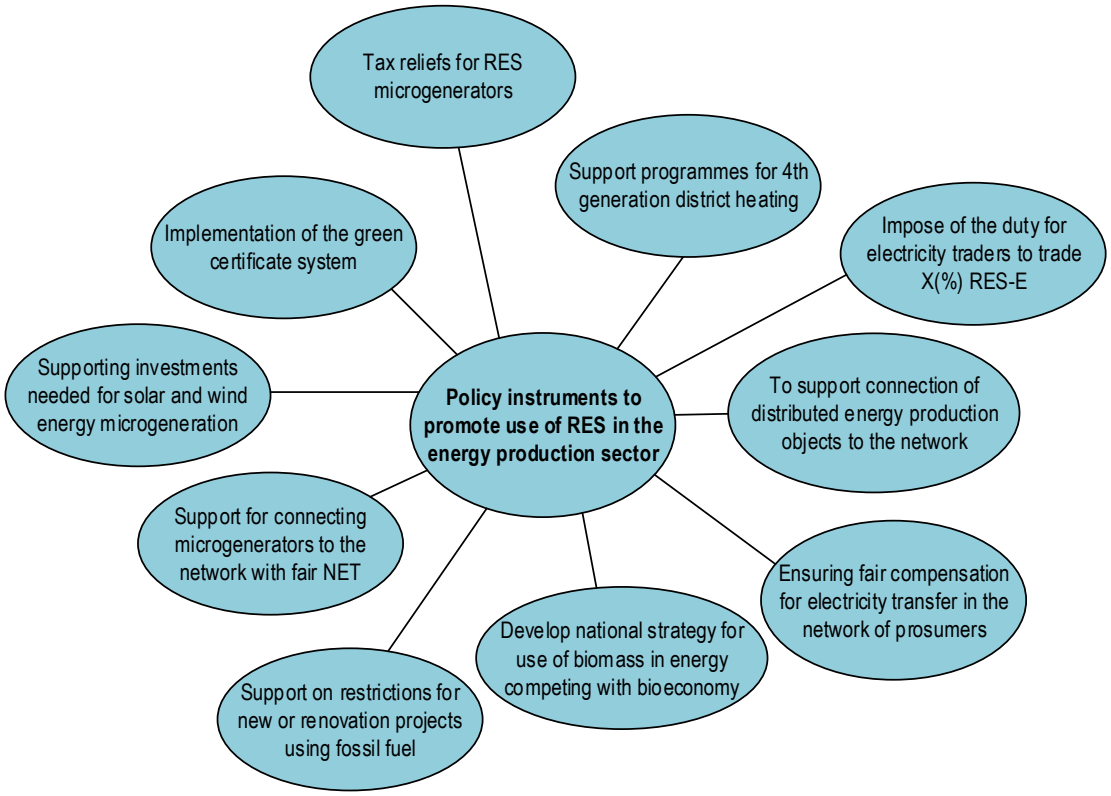

Figure 2.8. Policy instruments for promoting RES in the energy sector

The energy sector needs changes to the policy instruments for the deployment of renewable energy sources, as support in the form of a mandatory procurement component has now exhausted itself. Other solutions should be sought to support RES in the energy generation sector, such as changes in energy tariffs, policy instruments to support and integrate micro-generation, etc.

2.2. Results of the second expert workshop

The members of the second RES expert workshop analysed the impact of barriers and policy instruments that can remove barriers. The workshop participants were divided into RES resource groups (wind, sun, biomass, biogas, hydro) and one fossil energy group. The task of these groups was to graphically display three different development scenarios for energy resources and then to create causation charts for the use of the RES resource in energy, considering the barriers that hamper their use, and policies that could remove these barriers.

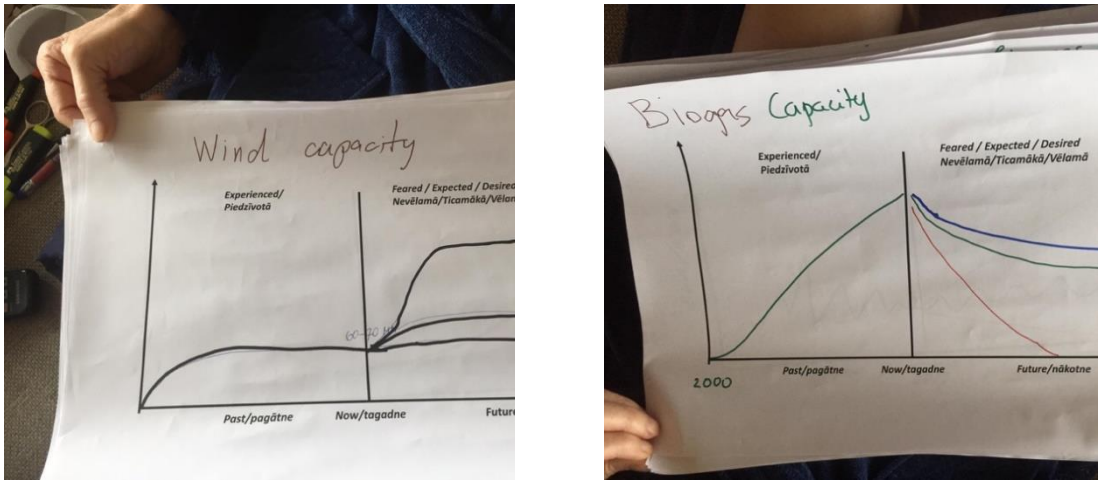

Figure 2.9. Examples of scenarios for the development of energy sources created by the Participants in the case of wind and biogas resources

The workshop participants had to predict three scenarios for the development of different types of renewable energy sources. Examples of energy development scenarios created by the workshop participants are shown in Figure 2.9. In the case of wind energy, a moderate development scenario and a rapid development scenario with significant support for the construction of wind power plants are forecasts. In the case of biogas, experts have forecast that the use of biogas in Latvia will be reduced in all scenarios. Such development scenarios are defined for each energy resource.

The next task in expert workshops was to identify causal links for each energy resource by identifying factors that affect energy prices, increased use of installed capacity and resources.

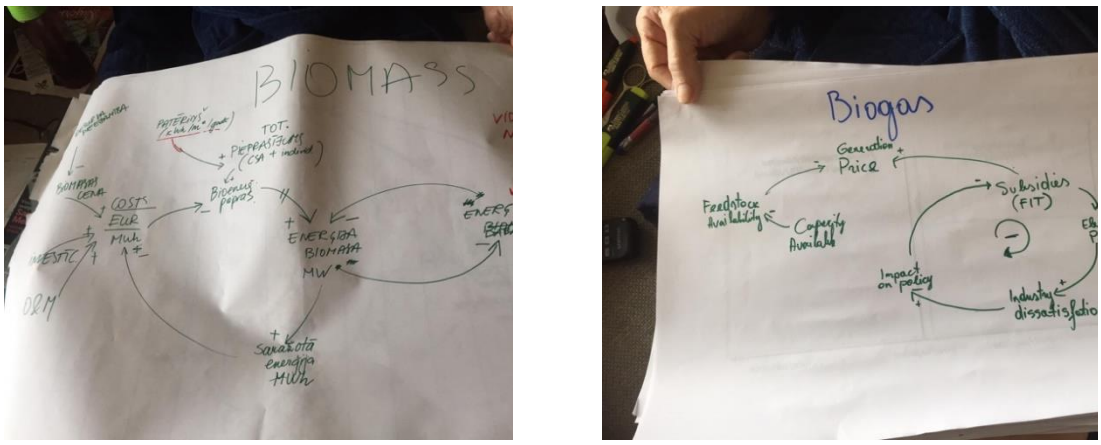

Figure 2.10. Examples from two causation charts in the working group.

The results of the working groups were presented, and discussions were held between all working groups on the resulting causation charts. The relationships obtained were integrated into the overall energy system causal loop chart shown in Figure 2.11. It shows that overall energy demand depends on the population (growing population, energy demand is increasing) and on changes in the efficiency of consumption due to innovation (the higher efficiency, the lower overall consumption). The higher the overall demand, the higher the demand for a specific energy resource. The higher the demand, the higher the price, which has a reversible effect on demand as it decreases.

Demand depends on the alternative energy supply (decentralised energy supply): the higher it is, the smaller the demand. On the other hand, alternative energy supply depends on public support, green policy instruments and alternative prices and taxes imposed on it. The price also affects production capacity, which, in turn, has a reversible effect on price.

Production capacity depends on the limits that will increase installed capacity by decreasing. The price is significantly influenced by the compulsory procurement component. Production capacity depends on investments made up of investments in technology and installation, subsidies, land prices, costs of accumulation technologies. The area of land available is an essential restriction in this part of the system. The production capacity influences the desired use of the production capacity, which, together with the price and operating costs, determines the use of the capacity. Operating costs depend on production costs, production technology level, operating and maintenance costs, investments, and resources.

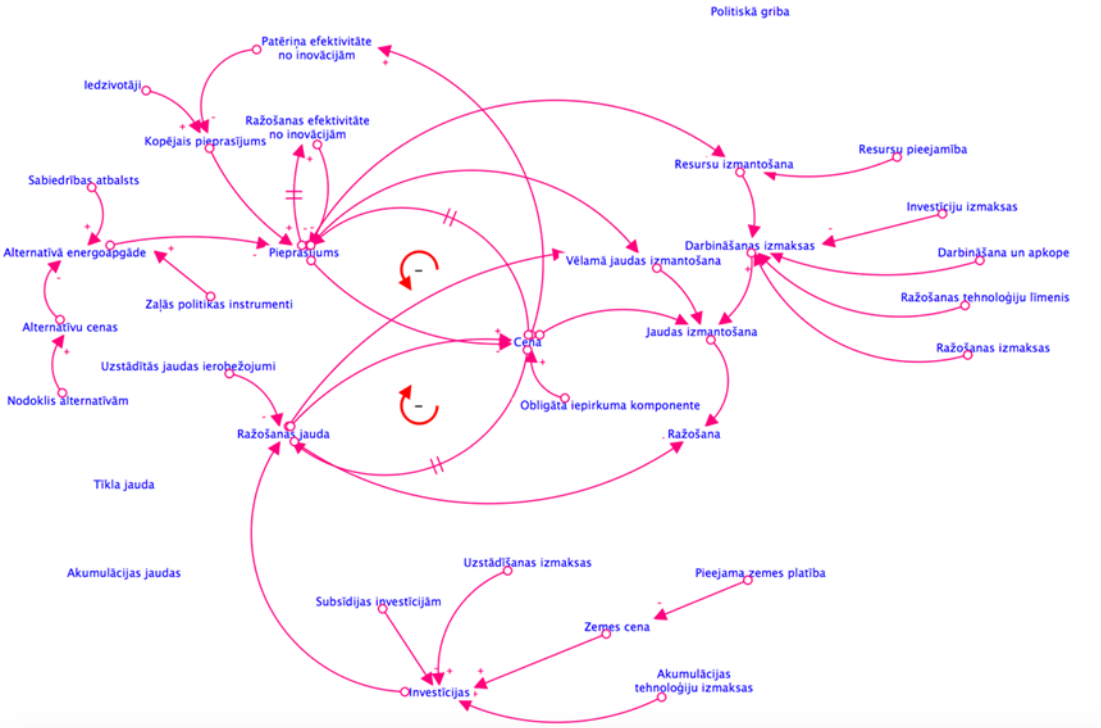

Figure 2.11. Integration of causation from the second RES expert workshop into the overall energy system causal loop chart

The dynamics of the system depend on two balancing loops: demand and production loops. In Figure 2.11, the mark at the arrow means the interaction between the parameters: "+" both parameters change in the same direction; "-" both parameters change in different directions. The members of the working groups also mentioned key factors such as network capacity, storage capacity and political will which, due to lack of time, were not integrated into the causal loop chart during modelling workshops but are integrated into the overall RES system dynamic model.

2.3. Results of a workshop of representatives of the remote municipality

In the remote workshop, municipal representatives were presented with the results obtained during the project and the topics related to the promotion of the share of RES at municipal level. During presentations, the workshop participants needed to answer various

questions to clarify their views on the main RES barriers and the necessary support instruments in municipalities.

One of the aims of the workshop was to identify the role of the municipality in increasing the share of RES. Several municipalities represented have indicated in their long-term planning documents that there is a need to increase the use of RES technologies, but many do not have this point in their planning documents. Consequently, the question was asked whether the increase in the share of RES should be directed as a target in local planning documents. In the survey, "Should the increase in the share of RES in your local government be a strategic objective?" a higher proportion (63%) replied that this question is already highly relevant, while a smaller part (13%) replied that the municipality already has a sufficient share of RES.

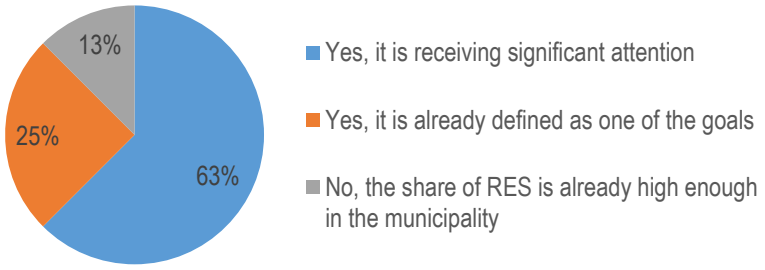

Figure 2.12. The answers of the representatives of the local government to the question "Should the increase in the share of RES in the municipality you represent be a strategic objective?"

In presenting the workshop participants with the current wind energy projects facing high resistance from the public, it was called upon to discuss the role of the municipality in the construction of wind parks. Following the results of Figure 2.13, 60% of the modelling working group members believe municipalities should promote population prejudices against wind parks while other members think that should not be done by municipalities.

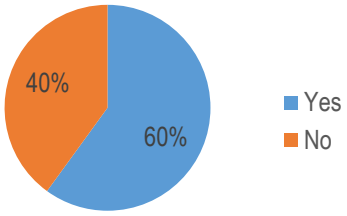

Figure 2.13. Answers by representatives of the municipality to the question "Should the municipality contribute to reducing the stigma against the construction of wind parks?"

A spokesman of Liepaja municipality noted that the construction of a wind park near the city has been suspended for several years due to the activity of environmental activists. In the discussion on the non-municipal right to support large-scale RES projects, it was concluded that the regulatory requirements for the construction of wind stations could be more specific in order to exclude their lack of support due to individual frustrations.

A higher proportion, or 91% of the modelling team, considers that solar technologies currently need support (see Figure 2.14.).

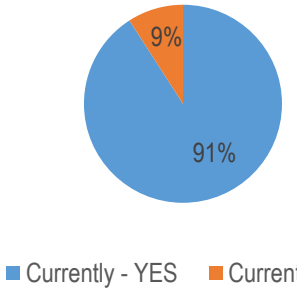

Figure 2.14. Answers by representatives of the municipality to the question “Is there a need for support for solar technologies?”

Slightly more than half, or 56% of the participants in the workshop, believe that the aid needed for solar technologies should be part of the repayment of capital investment. Other responses split between aid into subsidies, tax credits or any other form of support (see Figure 2.15).

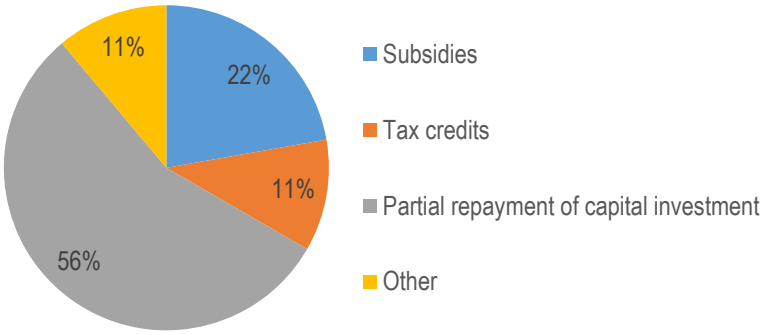

Figure 2.15. Results of the responses of representatives of the municipality on the most appropriate type of support for solar technologies

As the most problematic factors for the use of RES in the transport sector, the lack of funding and the high cost of transport were identified. Following the results shown in Figure 2.16, infrastructure scarcity and lack of knowledge are equally disruptive to the wider use of RES in the transport sector.

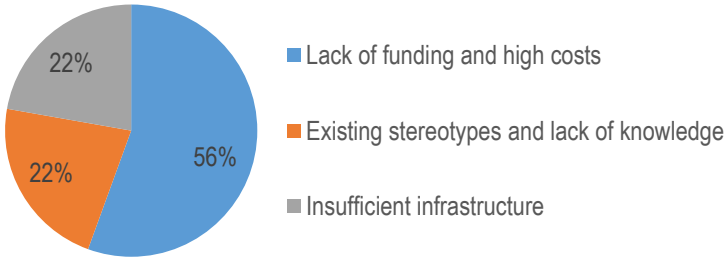

Figure 2.16. Results on key disruptive factors for the use of RES in transport

Electricity mobility (62,5%), which has gained the highest proportion compared to modern biofuels (37,5%), is seen more potential in the RES transport sector in municipalities (see Figure

2.17). It should be noted that none of the municipalities of Kurzeme identified biogas as a future development perspective in the transport sector. Representatives of Liepaja municipality pointed out that the infrastructure for compressed gas is being developed as a transition technology to more sustainable mobility.

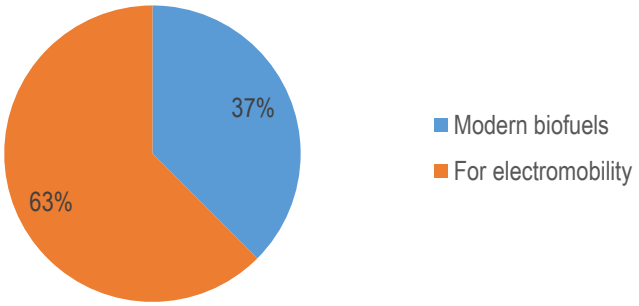

Figure 2.17. Technologies with greater potential for RES in municipalities in the transport sector

As one of the main policy instruments for increasing the share of RES, co-financing of investment costs of RES technologies or the application of tax breaks has been identified. To identify those sectors that should be stimulated by such policy instruments in the assessment of municipalities, a survey was organised on the optimal allocation of funding, if granted to municipalities (in the case at hand, the task was to assess the optimal use of €3 million to increase the share of RES in municipalities). Answers on renewable energy resources were received from members of the municipalities of Grobina, Talsi, Liepaja, Skrunda, Jelgava, Aizpute and Kuldiga.

It would be clear from local authorities that the funding allocated would be preferred to invest in the transport sector (29%) and the public sector or municipal and public authorities (29%). After Figure 2.18, it can be concluded that the least funding would support the service sector (8%) and other sectors not mentioned (4%).

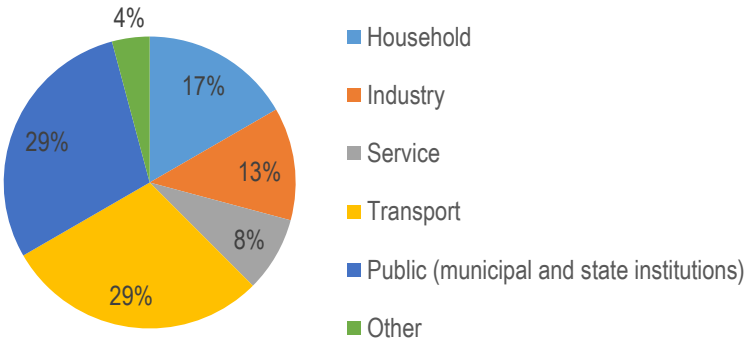

Figure 2.18. In which sector the financing of RES would be invested

The biggest barrier to increasing the use of RES in municipalities is a lack of knowledge (36%), as well as a lack of funding (36%). Nearly a fifth or 18% of the representatives mentioned that municipalities also have a lack of motivation to develop the use of RES, as well as 9% are other reasons preventing the development of RES.

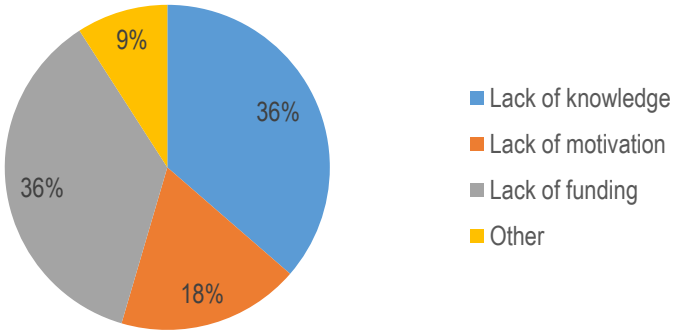

Figure 2.19. Barriers to raising RES in municipalities

Municipalities would most like RES technologies where I used solar power. Regarding to technology, the most popular are solar panels (29%) and solar collectors (19%), including wind turbines (13%), compared with other technologies (see Figure 2.20).

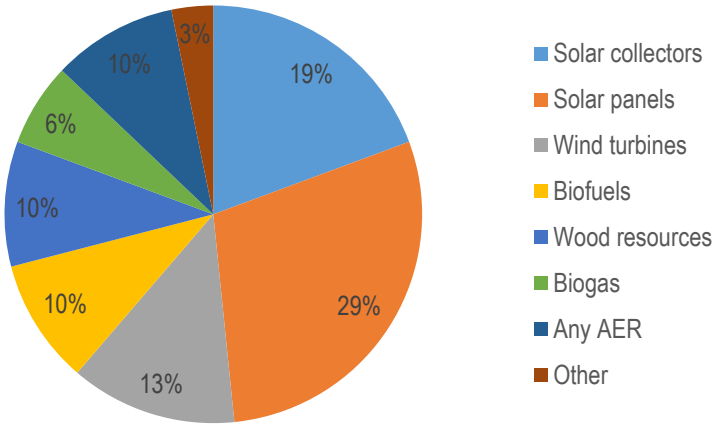

Figure 2.20. What RES and technology municipality would gladly finance?

The introduction of RES technologies also requires financial support. Most municipalities believe that this should be co-financed as capital costs (73%). Figure 4 shows that fewer representatives indicated tax breaks for real estate (18%) and support for the preparation of technical documentation for projects (9%) as desirable support.

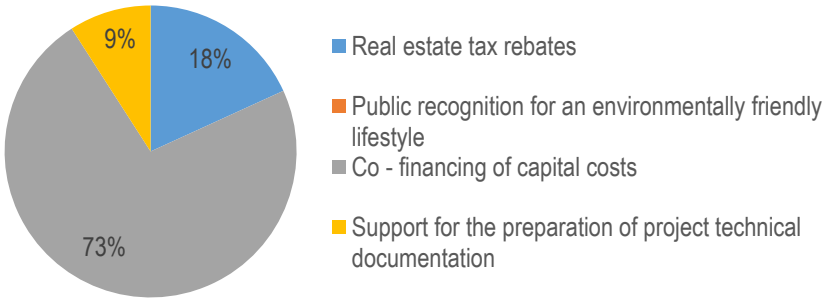

Figure 2.21 The most appropriate form of support for the deployment of RES technologies

Local authorities were asked about the optimal level of co-financing for RES technologies and the majority consider that co-financing in RES technologies should be 40-60%, while 36% think that co-financing should be 20-40% (see Figure 2.22).

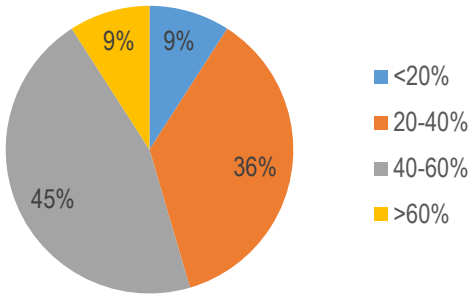

Figure 2.22. Preferred co-financing for RES technologies

If a real estate tax rebate was applied, 40% considered a suitable discount of 20-40%, but so much (40%) thought the discount should be more than 60% (see Figure 2.23.).

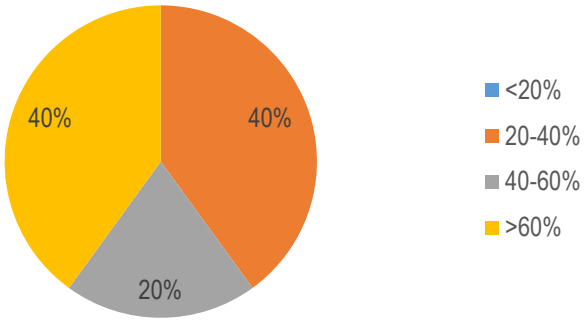

Figure 2.23. Preferred Real Estate Tax Discount

Such workshops are also planned to be implemented in other planning regions to identify the barriers linked to the deployment of RES at the local level and the necessary political instruments to encourage local government involvement in the promotion of the share of RES.

2.4. Awareness of stakeholders' views in webinars

Following an online presentation on 27 October at the “Renewable energy sources in smart energy systems” workshop. Opportunities and challenges", participants were invited to give their assessment of which stakeholders play a major role in increasing the share of RES. As can be seen in Figure 2.24, the government and municipalities play a key role in the 35-member perspective, while the smallest for households and energy traders.

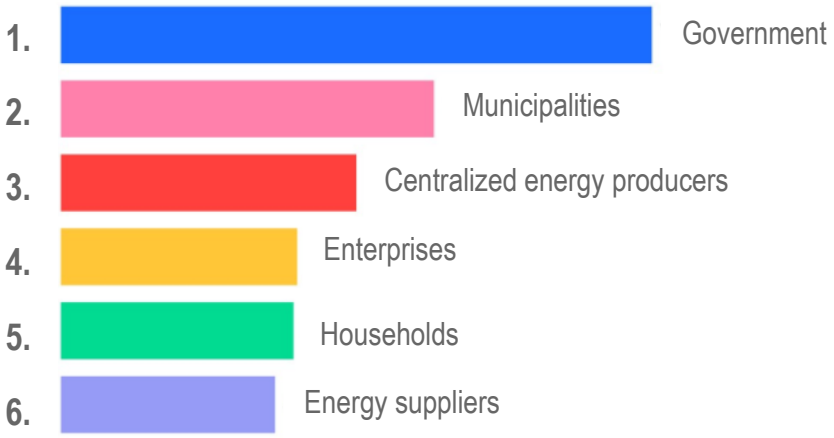

Figure 2.24. Answers to the question "Which of these have a major role to play in increasing the overall share of RES?"

In both organised online workshops, following presentations by project promoters, participants were invited to identify major barriers and barriers to the deployment of RES technologies. The responses of the participants are summarised below:

- Major investments are needed to implement new RES technology;
- The costs of maintaining high RES technology and the time of repayment;
- Lack of knowledge of RES technologies;
- Lack of financial support for technology deployment;
- Fossil Fuel and Gas Lobby;
- Lack of political support instruments to motivate the choice of RES technology;
- Companies have no interest in seeking information on RES technologies to implement them;
- Negative attitudes and resistance from people in the region to the deployment of RES technologies;
- No experience with RES technologies;
- Missing information on the most efficient technology in the region;
- There is no interest in looking for good practices where RES technologies are used;
- Reflections on the functioning and economic aspects of RES technologies.

3. CONCLUSIONS ON THE IDENTIFIED BARRIERS FOR INCREASING THE SHARE OF RES BY STAKEHOLDERS

- The main stakeholders for the increase in the share of RES are the highest national direct management authorities (Ministries), sub-national authorities of the State direct administration, local governments, central heat and electricity producers, electricity traders and transmission operators, technology producers, distributors, traders and designers, renewable energy associations, research and science institutions.
- Organised expert workshops identified many different barriers to increasing the share of RES related to the lack of investment in various technologies and the use of RES in transport, as well as other barriers, such as missing regulation and the introduction of infrastructure biomethane, a major societal bias in stopping wind station construction projects, a lack of a fair net settlement system for micro-generation for use, the existing methodology for calculating tariffs for district heating systems does not contribute to the development of undertakings.
- In all of the discussions organised with stakeholders, the lack of knowledge on RES technologies at both household and the municipal level was identified as a major barrier. This barrier could be overcome by various information campaigns on the role of RES in future energy supply. Improving the quality of knowledge and installation should also be promoted among equipment designers and suppliers by introducing quality standards or efficiency requirements for technologies.
- Several of the discussions indicated that national targets should be in line with the objectives of municipalities as well as with specific decisions related to the deployment of RES technologies. State policy does not currently encourage the formation of energy co-operatives, which could be promoted by supporting various legal issues.