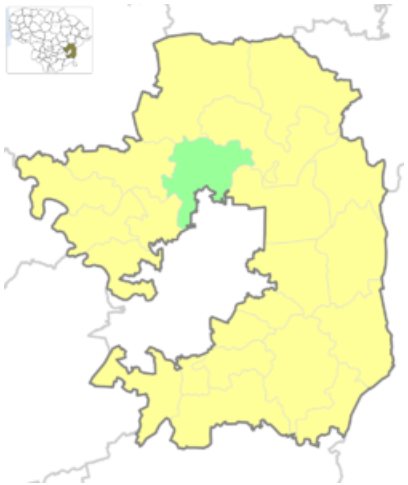
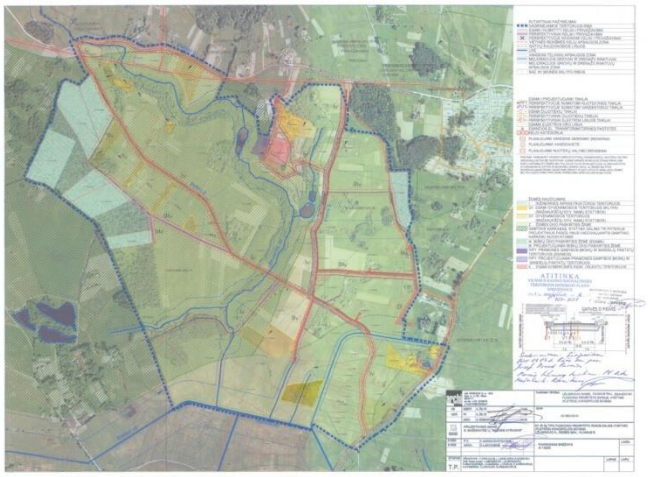
Green village Riešė (Vilnius Region)

Business model description

Civil Parish Riešė consists of 68 villages. Population – 5,650. Total area – 10,222 ha, incl. 5,938 ha of agriculture land; 1,840 ha – forests, 2,444 – water and other land. There are 2 post-offices, 3 primary schools, 2 libraries, the church, 5 shops, 4 country tourism farms, Pikeliškės manor (which formerly belonged J. Pilsudsky), Liubavo manor (which formerly belonged to J. Slizny), Raudondvaris tower (built in 1824), the European Park Museum, the European centre landscape reserve. Main economic activities of the parish are agriculture and service sector.

The centre of the parish is Didžioji Riešė settlement (population – 2,500). This settlement is located 10 km from the capital Vilnius. There are horse stables and recreation centre in the settlement.





Key Partners

Key partners in the development and implementation in the business model are:

- Lithuanian wind energy association;
- Vilnius horse stables;
- Riešė community;

Key suppliers are local farmers, forest owners, suppliers of renewable energy as well as certain share of convenient energy, using modern and efficient energy generation technologies.
Energy supply scheme involve both, renewable and fossil fuel resources, which will be used for production of heat and electricity as well as biomass fuel. For this community renewable resources are biomass, solar, wind and geothermal energy.

The **key activities** involve production of heat, electricity and biomass fuel, which includes the following actions:

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- Construction of biogas methane-tank for biogas generation using farming waste (manure supplied from pigs and cattle farms as well as horse stables;
- Construction of wood and straw pellets plant for biomass solid fuel production, using wood cutting residues, wood processing residues and farming waste (straw) supplied from forest owners, farmers and local industries;
- Construction of community wind mill for electricity generation;
- Construction of solar collectors and geothermal installations for heat generation in individual houses.

Produced energy resources will be used for heating of buildings, industrial processes, transport needs. Energy generation technologies are selected for available resources in the regions (with supplementing imported resources), which are appropriate for energy generation based o sustainable development criteria.
The use of fossil resources is inevitable during transition period.

Motivations for partnerships:

The main idea of the Business model is the establishment of Green Village with conversion to the use of RES for energy generation thus reducing dependence on imported energy resources and strengthening energy independence.

Mission and aims. The mission is to develop environmental thinking and preservation of environment among population. The aims are: to promote initiatives and community building in Lithuanian rural areas and settlements, as well as financial autonomy; to promote education and awareness raising in renewable energy sources. This would lead to optimization of economy, reduction of risk and uncertainty; acquisition of particular resources and activities in the Riešė Parish.

Key activities

General activities to gradual transfer from fossil to renewable energy require:

- Develop and/or find stakeholders consortiums for construction of biogas, solid biomass fuel (pellets, briquettes) production installations;
- Develop and/or find stakeholders consortiums for wind energy installations;
- Promote the use of biomass, solar and geothermal heat installations in individual housing sector;
- Develop and make the fuel supply chain cost efficient;
- Continuous evaluation and follow up

The key activities are to:

- Address industry, forest owners and farmers to be able to set up annual or longer contacts for different types of biomass such as wood processing residues, wood cutting and clearing

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residues, energy plants, straw, manure. Volumes and prices as well as time for outtake/delivery from forests, farming land, industries.

- Identify buyers (district heating company, individual housing) and their respectively need and requirements of fuel in terms of moisture content, ash content etc based on their boiler an fuel handling systems. In some cases fuel and mixes has to be tested to prove functionality.
- set up contracts with buyers based on fuel mix parameters, volumes and prices;
- Electricity generation from RES (biomass, PV, wind plant) is to be sold to national grid for prices, defined under existing legislation, which are declared by National regulation body and would partly ensure revenue streams for "Green Village" needs of Riešė Community.

Key resources

The key resources are the following:

- Existing park of district heating installations, individual biomass boilers;
- Well established communication and supply contracts between DH utitilies and forest owners on delivery of solid biomass fuel;
- Developed terminals storage of fuel until delivery;
- Machinery and vehicle park owned by forestry owners and farmers;
- Existing national biofuel trading system (under Baltpool);
- Existing national power transmission grid for delivery and purchasing of "green" electricity;
- Existing farms and horse stables for possible biogas installations.

Besides existing physical resources, we should mention intellectual resources – several high quality and skills energy experts are among the owners of Riese Community, who will be involved in selection of the most feasible and modern technological options both on energy production and consumption side, which would lead to gradual reduction in the use of fossil energy.
All projects to be implemented will use local human resources wherever possible and available.

Cost structures

The investment costs structure for this business model involves:

- Investment for biogas production and transportation;
- Investment into pellets or briquettes production facility;
- Investment into wind plant;
- Investment into solar and geothermal installations in individual houses.

The current cost structure involves:

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- Purchase of the biomass from forest owners and farmers;
- Harvesting and transportation to storage or DH company and to biomass fuel (pellets or briquettes) producer;
- Transportation of solid biomass fuel to individual customers;
- Fixed cost for machinery and property

Costs for the first group of investment should be gained from business's own means or consortium own means, support from EU structural funds, National Environment Fund, Riese Community own means, bank loans, owns means of the residents.

Value proposition

The value proposition is the flexibility of buyers to purchase mixed bioenergy fuels (biogas, wood-straw pellets, etc.) at lower price than current use of fossil fuel (natural gas) and forest residues alone. The deliveries are carried out on just in time basis avoid storage and handling costs on site.

Another value proposition is flexibility for individual house owners to refurbish their obsolete and non-efficient boilers and furnaces while adapting to new types of fuel.

Value proposition for Riese Community is development of new businesses (fuel production, energy generation and trade).

Diversification of fuel and heating options reduces heating supply risks and ensures security of supply.

This sector is more or less driven by lower cost on fuel and maintaining a high operational output without wear and maintenance on boiler and fuel handling system. The value thus has to be able to ensure:

- Lower cost than the current alternative;
- Same O&M level at customer;

Costumer's relationships

The costumer's relationships have to built on security of supply and quality assurance. Thus the fuel mixes has to be proven and demonstrated before long term agreements can be made.

However, the specifics of the community defines situation where there are more customers with lower volumes. Larger customers are district heating company, supplying heat to block residential houses and some administrational buildings. Others are small businesses with varying energy demand.

Transparency of the entire supply chain is crucial. Both in terms of quality assurance in fuel and energy supply as well as sustainability and environmental concerns.

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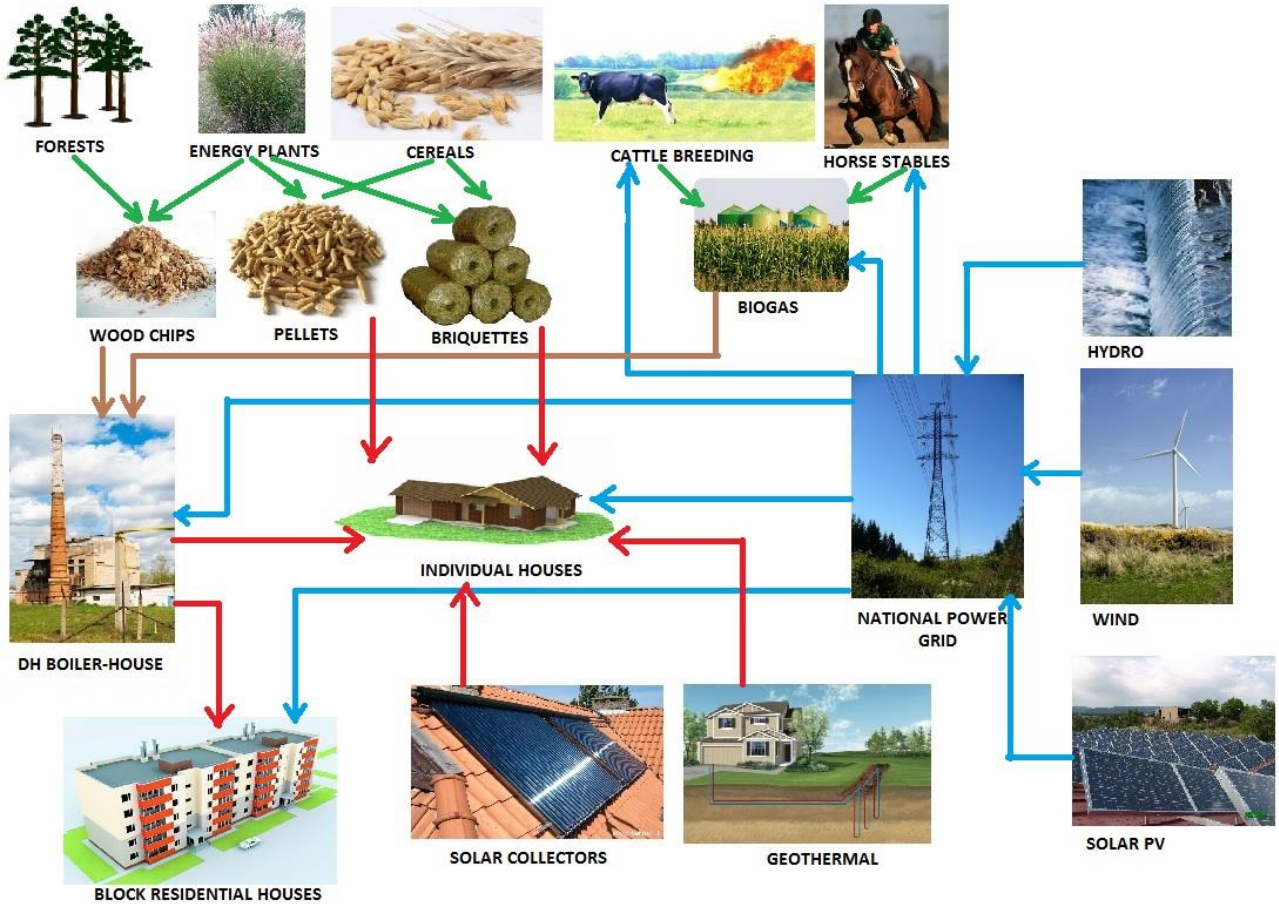
Channels

The distributions channels or supply chain is described in the illustration below.



Most stages in fuel supply chain are handled by Riese Community. The customers (except district heating company and business) do not have to arrange for own storages.

In addition ash recycling can be added as a further service to the user (heating plant).

Costumer segments

The costumer segmentation is based on the following:

- Geographical area is Riese Community - 10,222 ha with biofuel and energy producers and suppliers are inside the area, distance up to 20 km;
- Ability to used mixed energy and fuels (technical possibilities):
    - Wood chips and biogas for centralized district heating;
    - Wood and straw pellets and briquettes for individual heating;
    - Solar and geothermal energy for individual heating and hot water production;
- Ability to sell RES electricity to national grid – solar PVs, wind energy, hydro.

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Revenue streams

The revenue streams are based on dynamic pricing in terms of standards for certain types of fuel (pellets, briquettes), energy content within specified parameters of the fuel (wood chips, biogas). The end price includes all cost for production, transport, storage etc.

Revenues from fuel sales to final customers are distributed between farmers, forest owners and fuel producers.

Revenues from electricity sales to the grid are distributed between the participants of Consortium, including Riese Community.

Some sustainability aspects

Successful development of Green Villages is defined by several important factors, such as local population, specific area and criteria of sustainable development – economic, social, environment. Population mush show strong initiative, local authorities must provide all available support via Laws on Spatial Planning and Renewable Energy. The role of national authorities is expressed via support to SMEs.
Harmonization of the activities of all economies in the region is due to the need to define the share of RES in the area (wind, solar, geothermal energy biomass fuel – biogas, solid fuel) thus reducing negative impact to environment. Selection of technologies involved should use Life Cycle Analysis from efficient extraction of resources to efficient utilization.

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