Investment opportunity in innovative climate change projects in Poland - Synergy Project

21 – 23 October 2013, Wrocław

Innovation Festival 2013

Green Energy

Innovative climate change projects

- Poland as a big potential market for innovative projects in renewable energy sector
- Fast growing market
- The new knowledge of energy efectivness for production
- The big potential of biomas, solar and wind energy
- The big interest of using wastes for producing energy

Green Energy RENEWABLE ENERGY EXPERTS

Basic Information on the Company

Foundation of Green Energy ltd

The company was founded in 2008, as a strategic part for RES project in a Capital Group BCG

Strategic Objective

- Development of the high efficient renewable projects in Poland

Business Concept

- Become a private owned leader in the biogas plant and pv development and operation in Poland

Competitive Advantages

- Experience and knowledge with regards to each stage of a biogas/pv plant construction process
- Expertise in the field of environmental issues, power plant design, engineering and investment process management
- 17 biogas project under development
- 2 pv projects under development
- 2 biogas projects under construction

Basic Information on the Company

Plant Construction

Project Planning

- Location
- Environmental decision
- Agreements for biomas/checked in the lab Agreements for postferment Accces to the grid, heat user Building and technology projects
- Building permit

Construction

- Biogas plant construction
- Grid and heat construction
- Cooperation with technology supplier on the base of guarantie agreement
- Plant run and testing

SPV as a start-up for each biogas plant

- Plant start up to reach the level of 90% target biogas/power/heat output

Service

Service

- Technical service
- Biological service
- Training staff service
- Plant assurance

Management

- Optimal management of all plants
- Optimal logictics
- Optimal administrative issues

Plant Operation

Plant Operation

- Management of running plant
- Opimisation for feeding plant with biomass (Technology Supplier)
- Cooperation with Farmers
- Cooperation with Grid Owner
- Cooperation with Heat User
- Logistics of postfermented wastes on the fields
- Option – logisctics with postferemnted separated pdoduct for drying system

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Cooperation with the Third Parties

- **To meet requirements of the RES development Green Energy joined the cooperation with the companies supported the projects by their knowledge and skills.**
- **Among them the strong cooperation with Capital Group BCG Capital has been started in 2009 to start apply for EU grant financing in:**
  - Promotion of the GE and RES business,
  - R&D projects (GE has its own biogas researches)
  - Investment (GE has got two 70% EU granted biogas projects)
  - Economical researches (GE has got one grant in 2011)
  - 100% EU granted training programmes for its own and the employees from other branches
- **Thanks to the successful story Green Energy will apply for the other projects in coming years.**

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Renewable energy market characteristics

- **Huge market potential** – according to National Action Plan should be about 1000MW from biogas till 2020
- **Polish government** prefers biogas than wind energy for electricity supply
- New Polish renewable energy **legislation** under construction but comes in 2014 – preferable for biogas
- Currently in Poland only 7,9% of energy is produced from RES and **only 0,05%** from agricultural biogas.
- Moreover producers of energy from RES have also **priority access** to a transmission network and a reduced fee for grid connection.
- According to government calculations, Poland can produce **5-6 billion m^3** of biogas with natural gas parameters per year. It is estimated that farm and agri-food industry by-products alone can suffice to generate around 1.7 billion m^3 of biogas per year which accounts for ca. 10% of domestic gas consumption.
- Poland has a comparable **potential in agricultural land** and the biomass as Germany. German biogas market is established on the very high level compared to rising and promising market as there is in Poland

Country	Number of Biogas Plants
Poland	35
Germany	6140

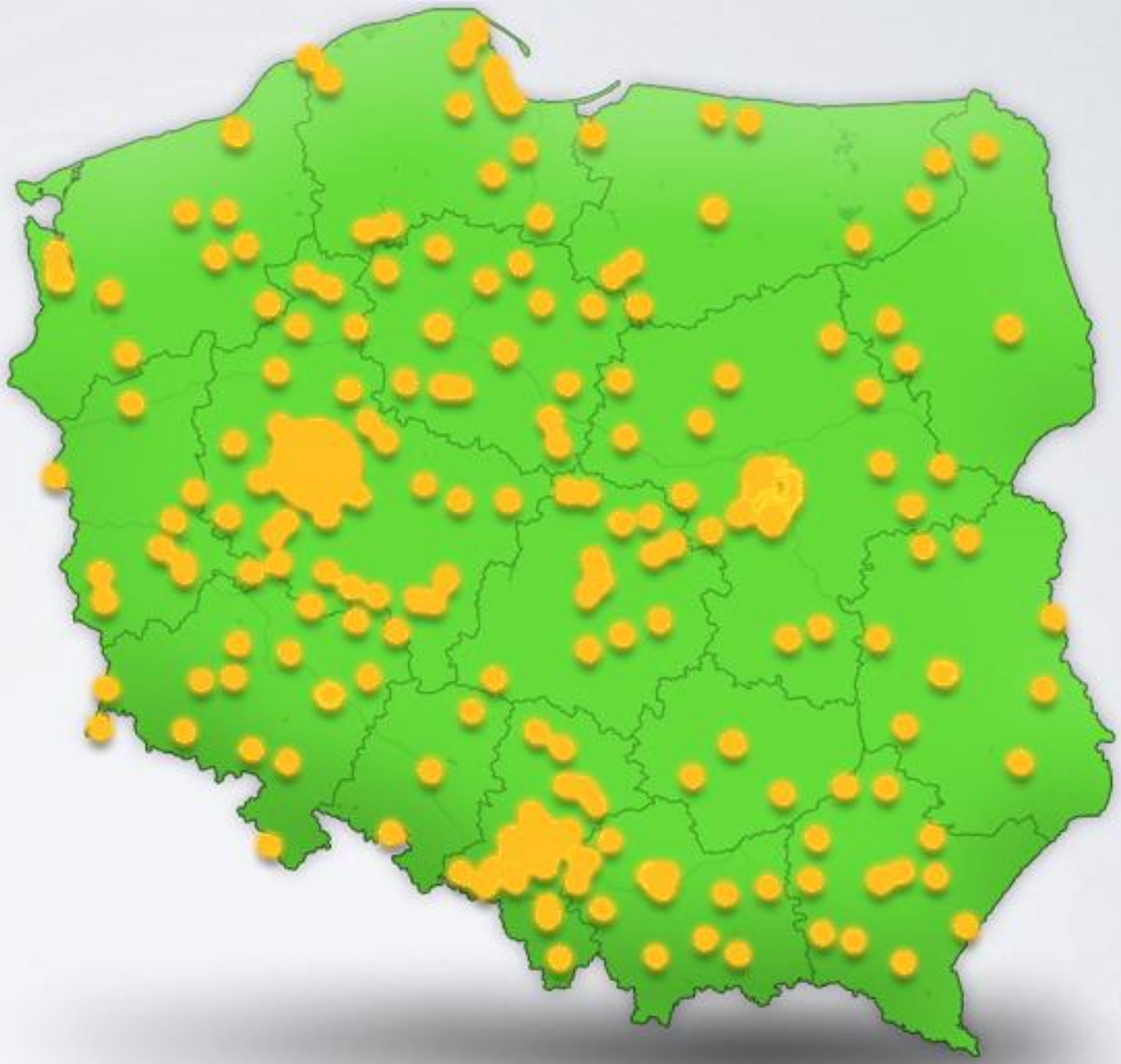
Renewable energy market characteristics

Biogas Plant Characteristics:

Power Input: 0,013 – 2,25MW

Year of Start of Operating: 2007-2012

Profile: Most of the biogas plants in Poland produce electricity and heat, where the heat is usually uses for own purpose



Source: Author's own elaboration based on the report "*Baza inwestycji, deweloperów i inwestorów w biogazownie BIOGAZ 2012*", Institute for Renewable Energy in Warsaw (www.ieo.pl)

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Renewable energy market characteristics

- At present, the Polish **photovoltaic market** is still relatively limited in size.
- Up to now only a **1MW** park has been connected to the grid, in addition to several smaller plants and off-grid installations, totaling just under **2.3 MW.**
- The RES Act was published in October 2012, showing the correction factor - the good motivator for the pv sector, and in total more than 800MW of pv projects have been developed in Poland for the last two years.
- Althoug the solar productivity is rather low (1000 working hours annually) the projects are socially accepted, easier to go through the administrative procedure to obtain building permit
- Everyone is waiting for the new law

Country	PV in MW
Poland	2,3 MW
Germany	30 000MW

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Legal Aspects

- **Renewable energy** is promoted through charge allowances or remissions, granting of loans for renewable energy projects and issuing certificates of origin.
- The certificates system for electric energy applies, in particular there are: green certificates - for electric energy generated from renewable energy sources, yellow certificates - for electricity generated by high efficient CHP
- On 10 November 2009 the Council of Ministers adopted a **resolution on Polish Energy Policy** until 2030.
  - main objectives in the area of renewable energy development (increase in the share of renewable energy sources in the final energy balance to 15% in 2020 and 20% in 2030, ensuring sustainable exploitation of agricultural land for biomass purposes limiting the possibility of competition between renewable energy and agriculture,
  - Actions aimed at increasing renewable energy production (defining actions which should be taken in order to achieve a 15% share of renewable energy in final energy consumption, with regard to all types of renewable energy sources and applicable technologies; upholding of the support mechanism for renewable energy producers based on the system of certificates of origin – green certificates; implementation of the program of agricultural biogas plant construction, aimed at launching at east one biogas plant in rural and Urban commune by 2020; upholding the excise tax exemption for green energy producers.
- Amendments to the **Energy Law Act**:
  - widening of the definition of the agricultural biogas – increase in the number of substrates qualified as useable in agricultural biogas plants,
  - more precise definition of the rules applicable with regard to obligatory purchase of Energy from renewable Energy sources,
  - exemption of agricultural biogas plants from any stamp duties,
  - amendments has come into effects as of 30 October 2011.
- On **13 July 2010** the Council of Ministers adopted a document „Directions for the Development of **Biogas Plants in Poland** 2010-2020 proposed by the Ministry of Economy and the Ministry of Agriculture.

Legal Aspects

- Since the end of 2011 the Ministry of Economy has been trying to improve the existing system based on the trade in green certificates.

- The last official version of the RES Act was published in October 2012, but the Ministry of Economy could not pass the RES ACT through the Steady Committee of the Ministers' Council.

- In November 2012 new Minister of Economy, Janusz Piechocinski, This movement logically affected the political enforcement of the RES Act draft. Then the green certificate market struggled at the beginning of 2013, and the RES support system became a major political issue.

- The Economics Council and the Strategic Department of the Prime Ministers' Office started to analyze the actual situation. They started to work on an energy mix for 2060, mainly based on the analysis of figures and presented the cheapest mix for Poland for the next decades.

- **The first results were somehow astonishing – black coal is supposed to be the cheapest energy source until 2060, but the document is far from final.**
- Poland should revise its strategy for the energy sector until the end of this year.

Legal Aspects

- Poland is going to introduce feed-in-tariffs, a support system **cheaper and easier** to handle than a quotation system.
- The FiT will be distributed via an auction system. Poland will generally take the same way as Italy has recently done.

- The experts with the Ministry of Economy first analyzed the Dutch experience, where the auction system has been in place for a longer period of time.

- The Dutch system had its downturns in the last years with less than 10% of the successfully tendered projects realized, but recently the system seems to be speeding up the real investments and project finance schemes are being introduced.

- The Polish legislator is convinced that Poland can learn from this experience.

Legal Aspects

- The auction system should support the most efficient technologies, which favors larger onshore wind projects with large rotor blades and relatively low CAPEX costs. There is **no cheaper way** of producing green energy with new investments.

- The important factor is the achievement of grid stability. Biomass burning installations, biogas installations and (small) hydropowers are able to provide electric energy on a more frequent basis than wind and PV do. It is possible that the auction system will treat **wind** and **PV** in different way than **biomass**, **biogas** and **hydropower**.

- Poland needs to support **new investments**. Co-firing and depreciated large hydropower plants are anything but a new investment. So these technologies will be phased out from the FiT/Auction system.

- Poland wants to avoid unreasonable profits, for which the consumer has to pay. So any offer above a certain CAPEX/OPEX calculation already being the basis for the calculation of the so-called correction coefficient in the RES Act published in October 2012 .
- REV– new agency (Renewable Energy Vendor should be a guarantor of a fair play of all participants in auctions. REV is unprepared and needs a budget increase to create new workplaces.
- The tenders for renewable energy sources will be devided into 3 capacity categories, up tp 40 kW, between 40kW and 1MW and above 1MW.

- New legislation is expected in 2014, but knowing the facts will be no later than in 1January 2016.

Synergy Project

All the RES components should work in synergy with people and environment.

- **SYNERGY** - Technology Park for transfer the RES knowledge will allow us to promote and also provide a space for the wider community to learn about new ecological technologies.

- The land 1ha allows us to prepare the wide range of innovative instalations
- 700 sqm building with conference room, offices, lab and guest rooms gives a great opportunity for tranings and study new technologies.
- The building was renovated with usage of the most innovative materials, giving in the end 49kWh/m2/a

- Development works began with an improvement to the energy infrastructure which involved upgrading the transformer supplying the site and the installation of a range of renewable technologies.
- **In the first stage** of development we will generate our own electricity from **6kW** of solar PV, and produce our own heat from a ground source heat pump. We will generate **600 W** of wind power.
- **The second stage** is to expand to:

- **40kW in PV**
- **6kW in wind**
- **30kW in biogas/biomass**

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Synergy Project

All the RES components should work in synergy with people and environment.

- Other technologies used in the park include **infrared heating** for the conference rooms, offices, and guest rooms, and a **solar carport** which charges our small fleet of electric vehicles.
- We are are prepared for researching and testing a range of energy storage technologies and hybrid PV/Thermal panels.

- Synergy Technological Park is to attract innovative ventures to delelop cutting edge technologies and gather in one place good envorinment to share the knowledge.

- Training centre with innovation and and exhibition part devoted to renewable energy
- Exhibition centre
- Education centre
- Conference centre

- To encourage business to renewable energy and ecological solutions for energy efficiency

- With this blend of green technology we envisage a regional centre to welcome householders, business owners, schools and universities

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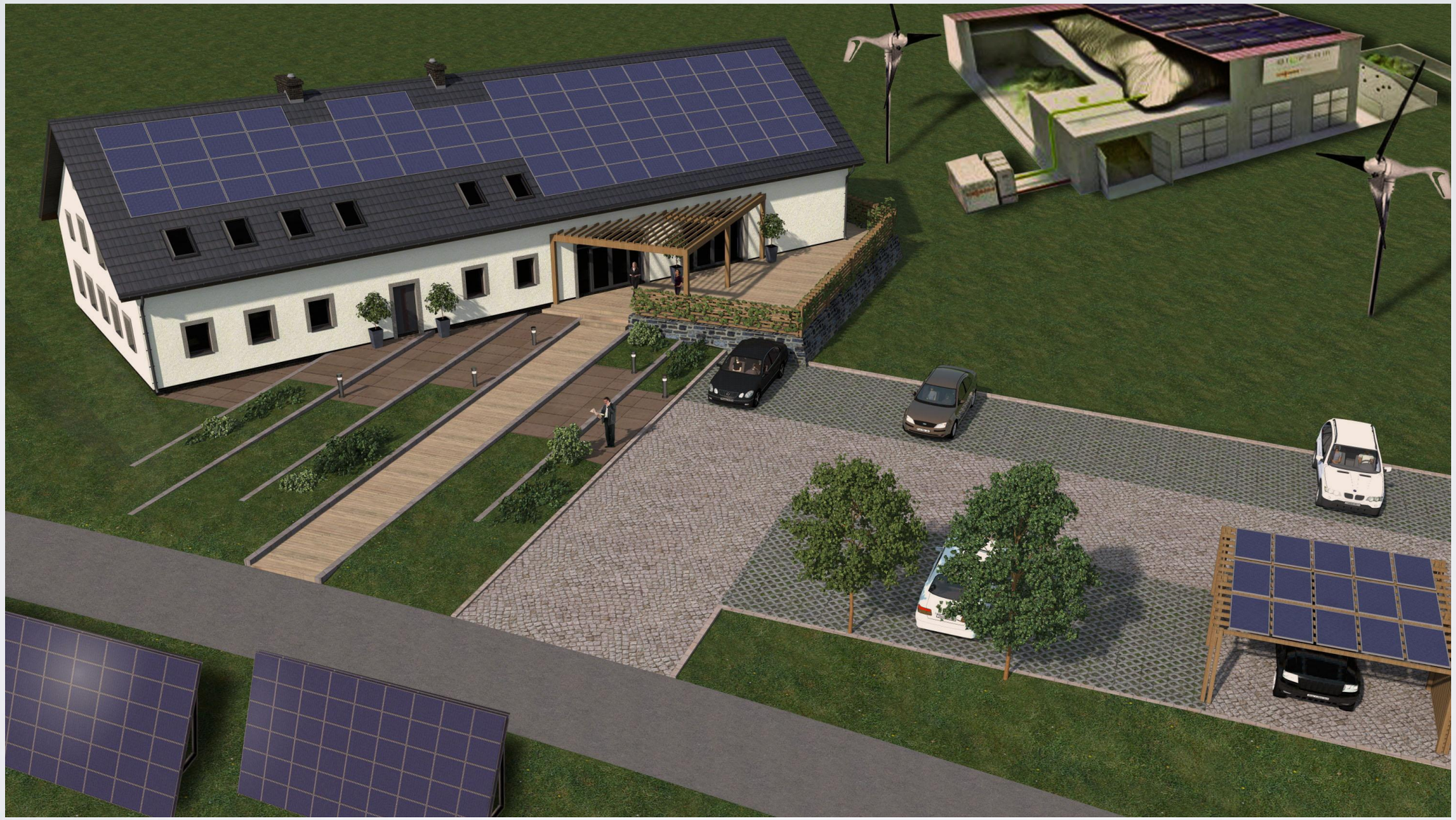

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Thank you very much for your attention

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