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BUSINESS PLAN
Photovoltaic (PV) Power Plant
Krvavi Potok

Ljubljana, August 2012 – October 2013

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Introduction

The development of technology regarding generation of electrical energy, global awareness of adverse effects of fossil fuels on the environment and prevailing opposition to nuclear power along with the guidelines of the European Union all direct and support the building of solar power plants in order to generate green energy from renewable sources. *Feed-in tariffs (FIT rates)* for generated electricity, set by governments in many European countries, encourage the investors to invest into such projects and at the same time guarantee the financers the pay-back time of investment, all during the repayment period that can be easily calculated.

The producers of PV modules and other components comprising the PV power plant give warranty to the products and 20-25 years of warranty on the efficiency of these components. This actually means that the producers are obliged to replace the modules, if they fail to produce the guaranteed amount of the electrical energy after a certain period of time; the warranty of this kind is usually covered by reputable and renowned insurance companies, which assume the responsibilities of such warranties. This includes the insurance companies that repay the PV power plant manager the expected amount of money from selling the electrical energy, in case the solar power plant sustained a decrease in its production due to force majeure or other reasons. All in all, the PV power plant operation is simple and does not require a number of qualified experts to make sure the operation runs smoothly.

Slovenian legal regulation is binding for every PV power plant – every PV power plant, generating energy from renewable sources, is to be connected to the electricity grid, thus providing perfect safety for the investor and the financer and ensuring smooth operation of the power plant. After the connection to the electricity grid, the investor chooses among a variety of options regarding the sales of electrical energy.

1. Abstract

1.1. Brief description of the company

Newly establish company EC project d.o.o., will be established in Krvavi potok for the PV power plant project and will be established only for purposes of this project. The company EC Projekt d.o.o., based in Roška cesta 2a in Ljubljana, will convey the building title for a part of the land, on which the PV power plant, owned by the company in question, will be set up. The company EC Projekt d.o.o. signed the *Agreement on establishing the building title* with the land owners of the total area; the company EC Projekt d.o.o. can award the title according to Substantive legal code. The company will be established in order to generate electrical power from renewable sources and selling this type of energy.

1.2. Opportunity and strategy

The opportunity to set up a PV power plant is mostly provided by the government, which ensures a mandatory purchase of electrical power for the period of 15 years, according to the Energy legislation and Regulation, following a subsidized price of electricity (FIT rate), which the government defines twice a year.

1.3. Competitive advantages

The ecological integrity methods of generating electrical power have become an increasing trend in the recent years, which will be even more appreciated and used in the future. We cannot discuss competitive advantage for PV power plants in Slovenia, as the purchase of energy is ensured by following a FIT rate. It is, however, worth mentioning that consumers favour this type of energy, because no environmental pollution has been caused by generating such energy; however, this does not influence the financial aspect of the investment, at least not in the short-term.

1.4. Economics and profitability

Setting up and starting a PV power plant is an investment, which in our case includes design, engineering, land regulation, enclosing (fencing), construction - foundations, erecting steel structures with solar moduls, inverters, transformer stations, cables and other components, necessary for smooth and effective operation of a PV power plant, sensor system for PV power plant surveillance and connecting to the grid and taxes, for 5,086 MW power plant - altogether amounting to 7.700.000 €.

The expected scenarios, inflows from selling the electrical power and the cost and profit section are defined in the financial scheme.

1.5. Management and personnel

A PV power plant does not fundamentally require the employees to be constantly present, so all the periodic work will be done by the manager of the individual company – for example, this work includes production account, issuing invoices for the electrical power generated, the supervising, i.e. monitoring the efficiency of the PV power plant operations by using a user-friendly computer programme. All maintenance work will be done by EPC company TEP INVEST d.o.o. and free of charge according to contract.

2. Industry, products and services

2.1. The company

Company will be set up in order to carry out the project of building a PV power plant. Company will be owned by one other natural person.

Despite the fact that the whole investment is based on the principle of the PV power plant covering the costs and liabilities by itself and ensuring profit for the owner, it is worth mentioning that additional inflow of money may be expected from the erected structures, the objects, onto which the PV power plant shall be mounted. Implementing the structures increases the whole investment in this project; however, regarding the increased feed-in tariff, which is associated to it in case of installing the plant as an roof mounted power plant, this increase is negligible, which means it is lower than the expected inflow from selling the electrical power at a higher feed-in tariff. Besides the income from selling electrical power, being the primary objective of this project, the structures will also ensure additional inflow, which will provide increased safety for the investor and the financer, mostly because of the ideal geographical location (vicinity of the motorway, Port of Koper and Port of Trieste). The trend and the plan of the ports mentioned are followed because of the increased operation and increased quantity of cargo and also because of the lack of space in the above mentioned ports, so as to store the part of the cargo in the so called satellite structures, located close to main transport roads, not far from the ports.
The EC Projekt will manage all the work regarding warehousing and will provide warranty to pay annuities to the bank with the warehousing revenues. This represents another safety feature for the bank, ensuring that all the annuities will be covered.

2.2. Industry

The industry of photovoltaics is relatively young, but it is fast growing, because of its potential, ecological benefits for not causing any pollution and technological development. Due to increased trend of generating energy from renewable sources, among which mostly biomass, biogas, wind and solar energy are common for Slovenia, the majority of investments primarily go to PV power plants, because there is no emission of CO2 in the atmosphere, as is the case with the biomass and biogas and a common problem with the environmentalists takes place when it comes to setting up a wind power plant. In Slovenia, other renewable energy source potential lies in hydroelectric power plants, but according to some experts this potential has almost fully been utilized in Slovenia.

The trend of building and investing into PV power plants in Europe and in Slovenia is growing quickly, which indicates that such an investment is safe, profitable and harmless to the environment. What is most obvious is how quickly the investments into PV power plants are

growing in the countries, where purchase and feed-in tariffs are ensured. Slovenia is also one of those countries, which also has ideal climate, mostly in the region of Primorska.

2.3. Products and services

The company will produce electrical energy, generated from renewable energy sources. Slovenian distributors of electrical energy market such energy in a way, separated from the energy, which is produced by fossil fuels. Currently there are such companies present on the market, but since the process is at the beginning of its life cycle, we can expect the offer will keep growing.

2.4. Market entry and growth strategy

The main reason to enter the industry are the requirements to provide electrical energy, generated from the renewable energy sources, as imposes the EU Renewable Energy Directive and a feed-in tariff, along with ensuring the purchase by the government. Since the consumption of electrical energy increases annually, the need to supply new energy sources is also increasing, mostly the need to supply energy, harmless to the environment.

By developing solar modules, the development in technology of relevant new materials is also taking place. This provides increased utilization of modules and increased capacity of electrical energy.

3. Market research and analysis

3.1 Customers

There are several potential customers (distributors/buyers) in Slovenia, covering the whole area. We are free to decide, who shall buy produced electricity.

From the beginning of 2011, selling of electrical energy to Italy is also possible, as there is a land for the project located by the national border. Italy is interesting mostly because of higher tariffs of electrical energy on the market, so the companies may as well sell electrical energy to Italy.

3.2. Market volume and trends

Until now there is only 133.5 MW of solar power plants installed in Slovenia, but this number is constantly increasing. Slovenia has obligation that it will produce at least 25% of all electricity produced in Slovenia from renewable sources until the year 2020.

If the slow moving trend of falling feed-in tariffs and the solar panels keeps progressing and the government incentives for this industry continues (the government is bound to follow the EU Directive), we can expect the industry to grow even faster, although this does not mean that saturation is any closer.

In order to set up a PV power plant, it is very important to have information on solar irradiation on the area, where the PV power plant is. In the Slovenian region of Primorska, the conditions for the PV power plant operation are therefore optimal, because the solar irradiation is the strongest there. Our power plant project is situated in the best part of Primorska region.

4. Economics of the company business

4.1 Profitability analysis

The company will operate at net profit in the first year of business. During a 15-year period, including the signed agreement with the state agency Borzen and the period of incentives, the profit will decrease slightly every year due to a normal end expected degradation of solar panels.

All the expected costs have been included in the calculation.

4.2 Fixed and variable costs

Fixed costs are represented by insurance, which will be made in case of vandalism, force majeure and consequently power failure – so called “All risk insurance”.

Fixed cost is also annual substitution for building title – 5,5% of amount of sold electricity.

5. Marketing plan

5.1. Market entry strategy

In order to increase competitiveness of renewable energy sources, the government has published a Regulation to order mandatory purchase of electrical energy, generated from the renewable energy sources and furthermore defined a feed-in tariff (FIT rate), which is a subsidy of the government and is set twice every year. This makes entering the industry simple and does not require a special strategy, because there is considerable lack of electrical energy on the market and the production of energy from renewable sources is widely encouraged.

5.2. Pricing strategy

Investors can chose between a so called »guaranteed FIT rate« or »operating FIT rate«. The former ensures investors a fixed FIT rate for 15 years (the period of contract with Borzen, the government agency) whereas the operating FIT rate stands for the incentive added to the market price of the electricity, meaning that the entire amount varies based on market electricity price movement – we believe that this solution is better.

We believe that an operating FIT rate is considerably better choice, as it ensures the financer/bank higher inflow from selling electrical power; the inflow can be easily calculated and is highly predictable. We have offer for following possible solution:

- 15-years contract with fixed price of 150,7 €/MWh.

5.3. Market communication

The company will not sell electrical power directly to natural persons, so there will be no advertising to approach them. The company will therefore have no costs with market communication.

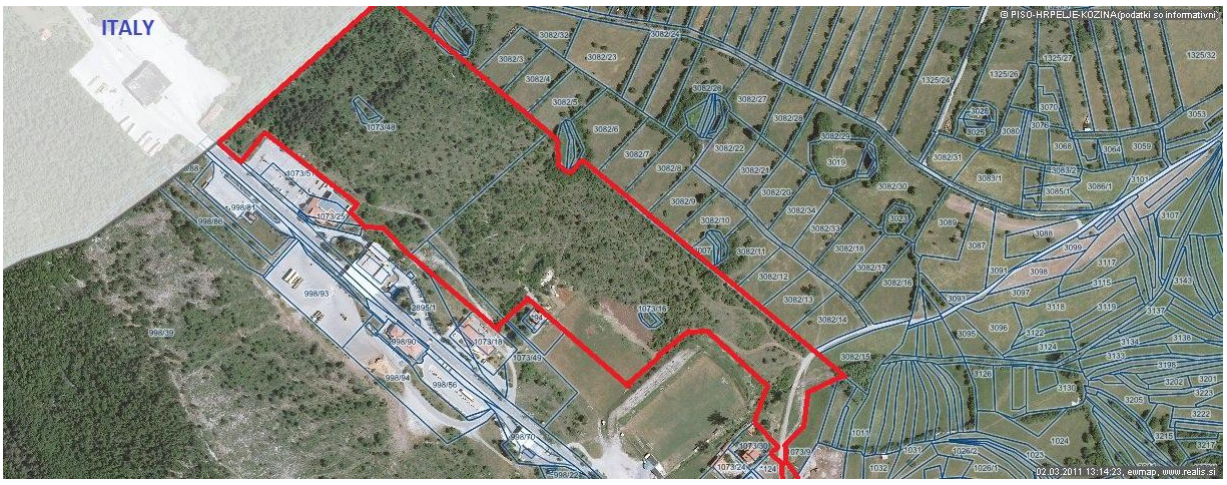
5.4. Distribution channels

When selling the produced electrical energy, the company will select an indirect distribution channel (producer – electrical power distributor/buyer – final consumer).

6. Product and service planning

6.1. Geographical location

The location of the land, intended for building the PV power plant is Krvavi potok near Kozina, in the region of Primorska. The land itself is situated directly at the national border of Slovenia and Italy and its surface area is 93.000 m^2. The location is excellent for erecting a PV power plant, as the winters in this area are mild and there is no snow, which normally makes the energy production more difficult, when the modules get covered in snow. Furthermore, the location receives exactly the same amount of solar irradiation as the coastal areas of Slovenia (1326 kWh/m^2), which receive the strongest solar irradiation in Slovenia; at the same time, the summer temperatures are a bit lower than on the coastal areas, providing the modules to be more efficient, as the utilisation rate decreases during heating.



6.2. Operating cycle

The process of generating solar energy through solar modules goes as follows:

Sunlight consists of basic particles, photons, which, by hitting a solar cell transfer their energy to electrons, generating electrical current. Sun cells produce direct current (DC), which is then converted into alternating current (AC) by the inverters.

The PV power plant will be connected into the public grid with an electricity meter, according to which the company will be invoicing the agency Borzen.

6.3. Legal requirements, permits and environmental issues

- All required permits and other requirements were obtained and solved during the process of obtaining construction permit. Construction permit is temporally pending until communal fee is paid. When this fee will be paid, construction permit will have full legal value and there are no other obstacles to begin with construction.
- We have also obtained permit to connect to the national electricity grid.

7. General time-table

When communal fee is paid, construction can begin. Expected time from beginning of construction to the end (on Turn-key basis) is 3-4 months.

8. Risks

- Destruction of panels due to weather conditions, force majeure or vandalism

In case of panel destruction due to weather conditions, force majeure or vandalism and therefore decreased production of electrical energy, we will have insurance contract with the insurance company, which also offers refund of the lost inflow due to decreased production of electrical power and therefore ensures we manage to achieve the revenues planned – All risk insurance.

- Damage of panels and other components of the PV power plant

Damaged panels and other components are replaced or repaired according to the warranty, valid for several years. Normally, such malfunctions should only occur rarely and should only cause damage on certain components or panels, which does not drastically influence the production of electrical energy; the decrease of electrical power would also be barely noticeable, because of the size of the PV power plant.

Certain unexpected events may take place during the operation; their source is not related to the company and they do not drastically influence the company's operations. The guaranteed FIT rate cannot be changed, because the agreement for a fixed FIT rate is made for a 15-year period and the PV power plant is properly insured against any event of loss and damage.

9. FINANCIAL ANALYSIS

The financial analysis deals with the investment as a whole.

We decided for EPC company TEP Invest d.o.o. from Slovenia who will construct power plant on turn-key basis. This company has lots of experience in this field and is familiar with local legal and other requirements. We also came to a conclusion that they can offer best prices and best quality component.

Warehouses – balance and cash flow

Warehouses, will be managed by EC Projekt d.o.o. This company will make sure that the warehouse capacities are full, it will run the bureaucratic procedures, necessary for warehousing, it will handle the structures along with the storing material and supervise and monitor these structures and material. It is clear that the investment into the PV power plant is repaid by itself and that the warehousing ensures additional guarantee that the annuities will regularly be paid off.

EC Projekt company already have preliminary agreements with logistic companies for rent of warehouses.

It is expected that income from warehousing will be 32.000 € per annum.

Offerte nummer/referentie	GY/ESC/191011.2	Geldig tot	22-03-2013
Datum	20-02-2013		Contact: Jako Bijl

Merk	SR 250-B	Vermogen Wp	250
Type	250	Vermogen Wp/m2	154

Gegevens locatie	oriëntatie	lengte	breedte	opp m2
Beschikbare oppervlakte (m)	Portret	-	-	-

Panelen	totaal	opp m2
Aantal panelen	20.344,00	33.231,92
Aantal panelen	-	-

Geinstalleerd vermogen Wp	5.086.000	
Verwachte opbrengst kWh	4.577.400	
Actuele prijs per kWh	0,150	
Verwachte terugverdientijd	8,84	jaar (bij vaste energieprijs)
Prijsindex stroom per jaar	3,5%	
Verwachte terugverdientijd	7,83	jaar (bij geïndexeerde energieprijs)
Besparing CO2 kg/jr	2.599.963	

Specificatie			aantal	totaal
	Wp			
SR 250-B	250		20.344	4.017.940,00
			-	-
2-MPP Tracker 3-Phase 20.000 Watt RS485/Bluetooth IP65			254	754.380,00
0			-	-
Montage				958.929,00
Materialen en diversen				335.790,00
				-
Totaal netto				**6.067.039,00**
Totaal bruto	BTW:	21%	1.274.078,19	**7.341.117,19**

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-PV portal – Slovenian photovoltaics portal (http://pv.fe.uni-lj.si/SEvSLO.aspx)

-PV legal (http://www.pvlegal.eu/en/)

-Online application ENGIS (http://www.engis.si/)

-Borzen (www.borzen.si/slo/)

-Energy Agency of the Republic of Slovenia (www.agen-rs.si/en/)