BUSINESS PLAN



Company: ECOsolaroof

Product: solar roof tile

20/11/2017



Executive Summary

ECOSOLAROOF HOLDINGS LIMITED "<u>ESR</u>" incorporated in England and registered under the n° 11120164 with office at 71-75 Shelton Street, Covent Garden, London, WC2H 9JQ, holds a patent registered at INPI n° **BR102013004092-4**, with international number **WO2015 / 213740 A1.**

ESR will start solar roof tiles production in 2018 and is considering a joint venture with Chinese partners in order to develop the production line of solar roof tiles.

The projected production volume of roof tile is 500.000 for the first year and will grow to 2.000.000 in year five.

	2018	2019	2020	2021	2022
Revenue	£ 59.361.277,20	£174.240.000,00	£ 191.664.000,00	£ 210.830.400,00	£ 231.913.440,00
EBITDA	£ 5.720.776,96	£ 9.034.160,00	£ 22.462.920,00	£ 25.018.440,00	£ 27.829.512,00
	10%	5%	12%	12%	12%
CAPEX	£ 5.512.000,00	£ 624.000,00	£ 624.000,00	£ 624.000,00	£ 624.000,00
Production per Product	2018	2019	2020	2021	2022
W160	372.516	1.016.400	1.118.040	1.229.844	1.352.828
W200	88.000	290.400	319.440	351.384	386.522
W300	44.000	145.200	159.720	175.692	193.261
Total Production	504.516	1.452.000	1.597.200	1.756.920	1.932.612

Figure 1. Five years forecast of cost and revenues.



Company Summary

Vision

Our vision is to provide affordable and clean energy thereby, accelerating the world's transition to sustainable energy.

The main **objectives** are:

- Produce high quality products, that generate clean energy and help to preserve environment;
- Become a leader in solar roof's production, offering affordable products for the customers around the world.

Legal Business Description

The company has Headquarter in London where the management is located and aims to create a joint venture with Chinese partners to install the production facility in China.

Founders and Management Team

CEO - Luiz C.G. Silva CTO – Charles Virgílio Silva CFO – TBD CCO - TBD

Strategy

ESR strategy is to produce the solar roof product and commercialize it through the distributors around the world. The company intends to market its products as an alternative to existing PV panels and demonstrates its advantages through the marketing strategies, exclusiveness, and brand awareness. ESR intends to build on its core portfolio of products and overcome any obstacles by using the company's expertise in the PV industry.

The company's goal in the next year is to make an overwhelming impact on the clean energy industry and meet the existing large consumer demand for the product. The partnership with



Chinese industries brings the possibility to expand the tile's production and meet the global demand for clean and sustainable energy.

Our goal is to produce at least **12,260,000** m^2 of tiles in the next 5 years, i.e. 1.2 gW / peak, given that the Chinese industry will produce in 2017 around 60 gW / peak.

Operation plan

- Foundation of joint venture in China first semester, 2018
- Start to deploy assembly line in China first semester, 2018
- Initial pre-production for international certification first semester, 2018
- Home production 20,000 tiles / month second semester, 2018
- Start of FOB shipping– first semester, 2018
- Home design / studies automation production line first semester, 2018
- Automation Testing- first semester, 2018
- Automation start second semester, 2018
- Increase production to 110,000 tiles / month second semester, 2018

Partnerships

The key partnerships to be established are to optimize the production, commercialization and dissemination of ESR tiles. The strategic relationship expected to be established with the following segments:

- Pultrusion Industries;
- Manufacturers of solar panels;
- Automation / Robotics Manufacturing Industries;
- Automation engineering companies;
- Logistics companies;
- Advertising and news agencies;
- Local Governments;
- Specialized websites and portals;
- 27000 specialized installers.



The supply of components for the manufacture of the blades will be provided by Chinese industries. The company had been using part of its components from the US, some of which the blades were integrally produced with Korean and Chinese products. As of fibre supply, the purchase of the products will be carried out by Chinese companies. The resins are produced in the major petrochemical poles, with diverse variations and qualities; of polyester, without the need for a catalyst system. The current process of system's manufacturing mainly uses the materials supplied by China.

Social Responsibility and Environment

Solar energy has the most abundant potential, when comparing with other source of energy, it has the possibility to provide a cheap decentralised energy to off-grid regions, replacing more expansive kerosene and diesel. This democratization and decentralisation of energy supply is offering the possibility for anyone to produce its own energy with zero marginal costs. The Photovoltaic technology is the most widespread technology, which converts sun light into electrical energy, without producing any emissions. PV technology actually is an essential tool not only in terms of energy production, but as well as regarding the employment opportunities, innovation of local economy and subsequently emissions' reduction from power sector.

Products

The solar roof tile is a *photovoltaic* system that has its electricity-generating solar cells mounted on the rooftop of a residential or commercial building or any other structure. ESR proposes:

- Eco solar roofs with solar tiles for generation, storage and distribution of electricity;
- The product could be used for commercial, industrial, residential buildings and road; railway, river and air transport means and etc.;
- On-grid and off-grid use;
- The product's power capacity varies in a range of **W160**, **W200**, **W300**.

Several models of roof tiles were designed, tested and selected according to the energy potential and installation cost. Moreover, various innovative components were implemented to facilitate



the installation and reduce the weight. The manufacturing process is currently transforming from retrofit model of the infrastructure to the pultrusion system. The solar photovoltaic blades are coupled for the generation of energy.

Strengths of the product

- Low installation cost;
- Low manufacturing costs;
- Clean energy generation and possibility to get the carbon credits;
- Possibility of autonomous electricity generation;
- Easy maintenance.

Intellectual property rights

The patent for solar roof product was registered in Brazil at the INPI (number: **BR102013004092-4**) in 2009 and internationally (**WO2015 / 213740 A1**)¹ in 2013. After several tests conducted with different types of technologies, our team came to the best economic result, using traditional silicon blades, with high and low quality of energy conversion. Moreover, the tests were carried out with recycled products, demonstrating the possibility to integrate already used materials into the new productive processes. This type of process brings the costs down and increases the sustainability of the project regarding the environmental conditions. The solar roof tile is the result of 15 years work at the Brazilian factory (see photos below).



¹ For more information please access the link of pattern:

https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2015123740&recNum=1&office=&queryString=IN%3A%28Charles+Virgilio%29&pr evFilter=&sortOption=Pub+Date+Desc&maxRec=30



Competitive advantages

Consumers who want to generate their own energy in the remote areas or reduce their electricity bill mostly use the PV panels. Recently, Tesla has launched new products – solar roof tile – offering the alternatives to PV panels. Our product has several advantages comparing with conventional PV panel and Tesla's solar roof:

Cost: while the solar roof of Tesla costs 8 USD/Wp, PV panel – 2.55 USD/Wp, our product is 1.55 USD/Wp.

Payback time: while conventional systems offer payback in 4 to 8 years, our system would have payback already in 2 to5 years.

Easy installation: The installation process doesn't need any special supports, thus reducing the costs; the materials are lighter than traditional PV panel of 23 kg. This reduces the cost with roof support, framing, and weight distribution, representing an economy. Moreover, with our product itis possible to verify the functioning of each tile, replacing only one broken part instead of the whole system.

Different design possibility: product could be produced in different colours, easy architectonic adaptation;

Partial roof coverage: Comparing with Tesla's solar roof, it's impossible to change only parts of the roof, while our product offers this possibility.

Market Analysis Summary

The potential market for ESRs tile is promising due to its low cost of installation. The roof tiles provide the generation of clean energy and could be installed at any areas with or without grid connection. The urban environment provides a large amount of empty rooftop spaces and can inherently avoid the potential land use and environmental concerns. The roof tiles could be installed on the rooftop of almost any buildings or structures. Moreover, the remote areas, which don't have access to the energy could benefit from our product, generating the energy during a day and using it during the night. As a result, it is an important tool to reduce inequality regarding the energy access in many remote areas.



We have already concrete demand from the Brazilian companies. We have already a purchase order from the Brazilian company De Marchi Indústria e Comércio de Frutas Ltda of **\$5,000,000**. They ordered 32,258 solar roof tiles, according to the document in the annex. Currently we are negotiating with other distributers and interested companies in Portugal (negotiations for the same value as the Brazilian company), Nigeria and other countries. Thus, we have already a guaranteed purchase orders for the first four months of the production.

The marketing plan to be adopted consists of the following topics:

- Creation of websites' translation for each country where there will be distribution;
- Digital marketing through social media;
- e-mail contacts, newsletter;
- Sales associated with cellular telephones or cable TVs;
- Parts and releases for communication and press, print media, Radio, TV, Web;
- Call-Centre for sales and distribution.

Moreover, the company plans to take advantage from the marketing strategy of TESLA, comparing the two technologies and presenting the final cost and advantages results.

Production

For the beginning of production, the following infrastructure and operating framework is defined for the assembly plant:

- Warehouse with 50 x 25 mts for storage of supplies / materials;
- Shed with 50 x 25 mts for assembly line;
- 3 assembly line tracks;
- 3 employees receiving materials for the assembly line, 1 for each runway;
- 30 employees on the assembly line, 10 for each runway;
- 3 staff in the reception and packaging of the tile, 1 for each track;
- Warehouse with 50 x 25 mts for storage of the packaged tiles;





Financial plan

			2018		2019		2020		2021		2022
Gross Revenues		£	59.361.277,20	£	174.240.000,00	£	191.664.000,00	£	210.830.400,00	£	231.913.440,00
Sales Taxes	17%	£	10.091.417,12	£	29.620.800,00	£	32.582.880,00	£	35.841.168,00	£	39.425.284,80
Net Revenues		£	49.269.860,08	£	144.619.200,00	£	159.081.120,00	£	174.989.232,00	£	192.488.155,20
Direct Costs		£	39.574.184,80	£	126.808.000,00	£	127.776.000,00	£	140.553.600,00	£	154.608.960,00
Channel Sales Commission		£	1.780.838,32	£	5.706.360,00	£	5.749.920,00	£	6.324.912,00	£	6.957.403,20
Total Costs		£	41.355.023,12	£	132.514.360,00	£	133.525.920,00	£	146.878.512,00	£	161.566.363,20
Gross Profit Gross Margin		£	7.914.836,96 13%	£	12.104.840,00 7%	£	25.555.200,00 13%	£	28.110.720,00 13%	£	30.921.792,00 13%
Personnel		£	1.801.560,00	£	2.596.680,00	£	2.618.280,00	£	2.618.280,00	£	2.618.280,00
G&A		£	392.500,00	£	474.000,00	£	474.000,00	£	474.000,00	£	474.000,00
Total Expenses		£	2.194.060,00	£	3.070.680,00	£	3.092.280,00	£	3.092.280,00	£	3.092.280,00
EBITDA EBITDA Margin		£	5.720.776,96 10%	£	9.034.160,00 5%	£	22.462.920,00 12%	£	25.018.440,00 12%	£	27.829.512,00 12%
EBIT EBIT Margin		£	5.720.776,96 10%	£	9.034.160,00 5%	£	22.462.920,00 12%	£	25.018.440,00 12%	£	27.829.512,00 12%
ЕВТ		£	5.720.776,96	£	9.034.160,00	£	22.462.920,00	£	25.018.440,00	£	27.829.512,00
Income Tax	27%	£	1.544.609,78	£	2.439.223,20	£	6.064.988,40	£	6.754.978,80	£	7.513.968,24
Net Income		£	4.176.167,18	£	6.594.936,80	£	16.397.931,60	£	18.263.461,20	£	20.315.543,76
CAPEX		£	5.512.000,00	£	624.000,00	£	624.000,00	£	624.000,00	£	624.000,00
Headcount			129		130		130		130		130



Use of Funds

		2018			2019			2020			2021			2022	
CAPEX Prototype	£	20.000,00	0%	£	624.000,00	14%	£	624.000,00	14%	£	624.000,00	14%	£	624.000,00	14%
CAPEX Production	£	92.000,00	1%	£	24.000,00	1%	£	24.000,00	1%	£	24.000,00	1%	£	24.000,00	1%
CAPEX Automation	£	5.400.000,00	70%	£	600.000,00	14%	£	600.000,00	14%	£	600.000,00	14%	£	600.000,00	14%
Personnel															
Management (CEO, CCO, CTO, CFO)	£	292.800,00	4%	£	468.000,00	11%	£	489.600,00	11%	£	489.600,00	11%	£	489.600,00	11%
Sales and Marketing (CCO Team)	£	121.500,00	2%	£	243.000,00	6%	£	243.000,00	6%	£	243.000,00	6%	£	243.000,00	6%
Technology (Production Team)	£	1.346.760,00	17%	£	1.788.480,00	41%	£	1.788.480,00	41%	£	1.788.480,00	41%	£	1.788.480,00	41%
Finance (CFO Team)	£	40.500,00	1%	£	97.200,00	2%	£	97.200,00	2%	£	97.200,00	2%	£	97.200,00	2%
Office & Factory London & China															
London and China Cost	£	200.000,00	3%	£	240.000,00	6%	£	240.000,00	6%	£	240.000,00	6%	£	240.000,00	6%
ICT and business tools															
Software Licenses	£	15.000,00	0%	£	18.000,00	0%	£	18.000,00	0%	£	18.000,00	0%	£	18.000,00	0%
HW/Phone/etc	£	20.000,00	0%	£	24.000,00	1%	£	24.000,00	1%	£	24.000,00	1%	£	24.000,00	1%
Maintenance	£	7.000,00	0%	£	12.000,00	0%	£	12.000,00	0%	£	12.000,00	0%	£	12.000,00	0%
Accounting Fees	£	12.000,00	0%	£	12.000,00	0%	£	12.000,00	0%	£	12.000,00	0%	£	12.000,00	0%
Legal Fees	£	13.500,00	0%	£	12.000,00	0%	£	12.000,00	0%	£	12.000,00	0%	£	12.000,00	0%
Marketing	£	52.000,00	1%	£	60.000,00	1%	£	60.000,00	1%	£	60.000,00	1%	£	60.000,00	1%
Travel	£	73.000,00	1%	£	96.000,00	2%	£	96.000,00	2%	£	96.000,00	2%	£	96.000,00	2%
	£	7.706.060,00		£	4.318.680,00		£	4.340.280,00		£	4.340.280,00		R\$	4.340.280,00	



Annex 1.

Purchase Order

PO Nº 00001

Date: 12/20/2017

VENDOR	ECOSOLAROOF HOLDINGS LIMITED	BUYER	De Marchi Indústria e Comércio de Frutas Ltda.
	U.K. 71-75 Shelton Street, Covent Garden - London		Estrada Particular de Marchi, no 470 - Jundiaí/SP - Brasil

Shipping Method	Shipping Terms	First Delivery Date		
FOB Origin - Shanghai Port	Freight Collect	03/31/2018		

Qty	Item #	Description	Job	Unit Price	Line Total
32258	W160	Photovoltaic tile W160	internal	\$ 155.00	\$5,000,000.00
	·			Subtotal	\$5,000,000.00
				Sales Tax	-
				Total	\$5,000,000.00

The payment will be done in four parcels of \$ 1,250,000.00, the first one on the act of delivery at Shanghai port, and the other parcels will be paid at the same date of the next deliveries.

De Marchi Indústria e Comércio de Frutas Ltda.

These shipping will be delivered at Shanghai port in 4 parts, one at each month after the first delivery on march 31st 2018, subsequently, April 30, may 31 and june 30.

Authorized byDateEDVALDO GUIO12/20/2017



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