BusinessPlan 2013

GLOBALSOCIALVENTURE COMPETITION

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KINGFISHER polymers

… your favorite partner for polymers.

Quantitative analysis of the social and environmental impact

Scope

The mission of Kingfisher Polymers is to transform plastic waste into valuable raw materials, using processes that are sustainable. We want to define the sustainability of the project by a triple point of view, including the social, environmental and economic attributes of the investment.

While the economical objective is easy to define, and has already been discussed in detail, the main social and environmental issues we are addressing are:

- Reducing waste sent to incineration or landfill
- Reducing oil consumption
- Increasing employment

This analysis is limited in scale and considers a single plant, working 10 kton/year, operated by 10-15 people. As already discussed, the plant can be replicated many times in Italy and everywhere in the world where there is separated collection of plastic.

Due to the strong industrial basis of the project, we believe that its social impact may be considered to have a long lasting duration, at least as long as the plant, tools and facilities, with no drop off. This duration can be conventionally estimated as 10 years (the same as the depreciation): that is more than the 5 years period considered for the analysis.

In order to define the impact we follow the SROI Guidelines, based on the impact, changes and outcomes for the key stakeholders.

Stakeholders analysis

We proceed in the following with a brief analysis of the stakeholders and the description of the key changes that affect them. The numerical values are shown in the following Impact Map, after which each stakeholder is described with more details about the evaluation.

	Stakeholders	Changes	Inputs		Outputs	Outcomes					Deadweight	Drop Off	Impact
		Description	Description	Value	Description	Description	Indicator	Quantity	Financial proxy	Value	%	%	
Social Impact	Employees	Job creation itself)	Waiver for unemployment benefits	€ 150'000.00	Jobs created	Wage + Personal Satisfaction	Number of new jobs created	12.5	Average wage	€ 35'000.00	0%	0%	€ 437'500
	Neighborhood	Increase local economy	--		Increase in PIL	Increase in wealth	Total Expenses	1	OpEx exc. personnel	€ 390'000.00	0%	0%	€ 390'000
	Government	Unemployment rate, ees subsidies	--		Jobs created	Increase in welfare	Number of new jobs created	12.5	Unemployment subsidies	€ 12'000.00	0%	0%	€ 150'000
	Government	Increased taxes for government expenses	--		Increased taxes collected from firm	Increased public expense - welfare	New taxes paid	1	Taxes Paid by firm	€ 13'000.00	0%	0%	€ 13'000
	Universities	Stimulus to research	Researchers	€ 72'000.00	N. of research projects	Research projects financed	Value of research (as % of expenses)	30%	estimated expenses	€ 72'000.00	0%	0%	€ 21'600
	Entrepreneur Team	Higher satisfaction	Time	€ 150'000.00	Value created	Personal Satisfaction	% received of Dividends paid	70%	FCFE	€ 60'000.00	0%	0%	€ 42'000
	Investors	Economic return	Money (Equity)	€ 310'000.00	Value Created	Dividends	% received of Dividends paid	30%	FCFE	€ 60'000.00	0%	0%	€ 18'000
Environmental Impact	Environment (Air)	Avoid incineration of plastic waste	--		t of plastic recycled	Lower pollution (air)	Amount of CO2 not produced	17'122	Cost of CO2 emissions per ton of CO2	€ 6.38	25%	0%	€ 81'930
	Environment (Land)	Avoid dumping of plastic waste	--		t of plastic recycled	Lower pollution (land)	Amount of material not sent to landfill	3'300	Cost of landfill charges	€ 157.45	25%	0%	€ 388'669
	Environment (Land)	Avoid oil consumption for virgin polymers production	--		t of plastic recycled	Lower pollution (land)	Amount of oil not extracted/ used (barrels)	74'074	Cost of oil per barrel	€ 70.45	25%	0%	€ 3'914'141
	Environment (Energy)	Less power consumed	--		t of plastic recycled	Energy savings	CO2 not produced	40'880	Cost of CO2 emissions per ton of CO2	€ 6.38	25%	0%	€ 195'610
	Environment (Water)	Less oil spills	--		t of plastic recycled	Lower pollution (water)	Amount of oil not extracted/ used (barrels)	74'074	Cost of spills per barrel extracted	€ 0.23	25%	0%	€ 12'000

Supply chain

The main change for suppliers and customers is that they are to be part of a greener supply chain, but the benefits of this are mainly for the environment, and valued accordingly.

Employees

Given the economic downturn and the unemployment level, we can consider that every job created can, directly or indirectly, reduce the unemployment level by one unit. So, the employee must waive for unemployment benefits (12'000 €[1]) in change for a real job (average wage = 35'000 €[2]). The personal satisfaction that follows to getting a "real" job has not been evaluated. We can estimate 10 to 15 new jobs for each plant, we use 12,5 as the average.

Neighborhood

The construction of an industrial plant has a significant impact on the local economy. For this reason we believe that the neighborhood may be affected by a positive impact through productivity growth of nearby industries, which leads to a situation of greater well-being. We evaluate this impact as the set of all estimated operating costs[3], excluding personnel costs.

Government

The government has a double advantage by the onset of an economic activity in the territory. On the one hand, the creation of jobs reduces unemployment, and discomfort associated with it. On the other hand, the new activity generates a tax base from which to draw taxes, then used to finance expenditures for the welfare of the population. We can evaluate the first of these contributions as savings in unemployment benefits (12,000 € per job created, as stated before), while the latter is directly taken from the estimates of the income statement[4].

Universities

The proposal by Kingfisher wants to stand out from the competition by its very technical/scientific basis. For this reason it is essential to contact the University to investigate aspects of innovation and research. Scientific research has notably positive effects in the long run. According to a paper by Nature[5], the benefits of the research generate a perpetuity equal to 30% of the amount invested for years. The impact to the universities is due to dedicate personnel and equipment; we will be able to include the equivalent of 3 Ph.D. students (12k€/year each.), and we consider the use of university facilities by doubling the value considered, for a total value of 72k€. We only consider the effects of the first year of research.

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[1] According to Italian welfare regulations
[2] As estimated for this business plan
[3] We derive these costs, year by year, from the balance sheet of this business plan
[4] We derive these costs, year by year, from the balance sheet of this business plan
[5] NATURE, Vol 465, 10 June 2010, What science is really worth.

Entrepreneur team and investors

The positive environmental impact that our proposal is based on solid industrial base, which require a significant financial investment. That's why we have to consider the economic impact, mainly driven by investors, which is estimated from the total value of the investments of venture capital (310'000 €[6]). Entrepreneurs contribute, for their part, through unpaid work, thus giving a fixed salary to allow the start-up of the company, in exchange for personal satisfaction (not measurable), and money.

The social benefits due to entrepreneurial and investing activity have been recognized in the development of the economy and in the creation of jobs. To this we add the correct value of dividends (70% for the entrepreneurs, 30% for the investors) that may be paid or reinvested, and are evaluated as equal to Free Cash Flow to Equity calculated from the financial perspective[7].

We do not consider the debt capital because they do not generate additional value for banks, in addition to the interest rate.

Environment

Given the nature of our initiative, the environment is undoubtedly the stakeholder benefiting from major changes. The main effect/benefit is the reduction of the negative impact with respect to the disposal of all plastic and to the production of virgin polymers from oil. For this reason we analyze separately the different components (air, water, land, energy). We have decided to assign a Deadweight/Attribution of 25% to all the environmental voices because we believe that:

1) The part of the outcome related to disposal is also due to the work of our suppliers. (Attribution = 25%)
2) The part of the outcome related to the increase in recycled material could substitute part of similar outcome due to regulations and increased environmental sensitivity. (Deadweight = 25%)

Air

Plastic recycling is a distinctive destination alternative to its incineration with energy recovery (or disposal in a landfill). The reduction in the amount incinerated, which we estimate equal to 2/3 of the amount recycled (i.e. 6’700t), results in a reduction of emissions into the atmosphere, and in particular of carbon dioxide production. Knowing the cost of trading CO_2emissions (6.38€/EAU[8]) and the amount produced (about 2.56 tons CO_2 per 1 ton of polymer burned[9]), it is easy to assess the economic impact.

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[6] Investment required by this business plan
[7] We derive these costs, year by year, from the balance sheet of this business plan
[8] According to “Commodity Exchange Bratislava” www.carbonplace.com on 2nd December 2013. See also co2markets.co.uk. EAU = European Allowance Unit, corresponding to 1t of CO_2.
[9] Calculation for the stoichiometric balance of the combustion reaction

The impact is also on the reduction of other gases, heavy metals and volatile contents, but it is not calculated, and neglected here.

Water

The use of recycled plastics by our customers reduces the use of virgin plastic, and therefore the extraction and transportation of oil. With regard to transport, which is via oil tankers, it can be subject to tragic accidents leading to pollution and the destruction of entire ecosystems.

We have estimated the cost of this damage by evaluating the cost of the spilling of one liter (81,17€[10]) and the liters spilled per liter extracted (0.002%[11]); from these values we calculated the environmental cost of spilled oil for barrel (1 barrel = 159 liters = 135kg) extracted (0.23€/barrel).Considering, to be on the safe side, that 1t of polymer requires 1t of oil (but it requires more, up to 2ton), we can estimate that not producing 1ton of virgin polymer saves 7.41 barrels of oil. From this information, and the amount of polymer recycled (10kton), we can derive the benefits.

Land

The reduction of the amount of oil extracted is another positive aspect on the environment. We believe that the benefits obtainable for the environment is priceless, because non-renewable resources cannot be substituted, but for our scope it can be estimated with the cost of oil (70.45€/barrel[12]).The amount of barrels saved is the same as calculated in the "Water" paragraph.

The reduction of the amount of plastic waste destined for landfill, which we have estimated to be 1/3 the amount recycled (i.e. 3'300ton), must also be considered. The benefit is treated as the cost saved for disposal (157€/ton[13]).

Energy

Plastic recycling involves a process significantly less energy intensive than the production of virgin plastic, both for the technologies used and for the reduction of the incidence of transport. The impact on the environment can be estimated based on the amount of carbon dioxide released from the production of energy (0,708 tons CO_2 per MWh[14]), and the amount of

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[10] This cost is the ratio between the barrels spilled in the Exxon Valdez disaster and the fine paid by Exxon, according to the "State of Alaska's Exxon Valdez Oil Spill Trustee Council", converted in Euro/liter.

[11] The percentage is calculated as the ratio between the barrels spilled between 1990 and 2010, according to the "International Tankers Owners Pollution Federation", and the barrels extracted in the same period, according to US Energy Information Administration.

[12] Official price (93$/t) for January, 2nd 2013 on www.oil-price.net @1,32$/€.

[13] Italian Landfill list price

[14] According to a research at European level commissioned by "Covenant of Mayors": www.eumayors.eu/IMG/pdf/technical_annex_en.pdf, verified on January 2nd, 2013; the value used is the one calculated for Italy.

energy saved per the quantity of plastic recycled (5,77 MWh/ton[15]). The benefit evaluation is based on the cost of trading CO_2emissions (6.38€/EAU[16])

Results

All the values obtained are projected for a total of five years, and discounted to the end of Year 0 with a discount rate of 12%. We have chosen such a discount rate because it is the same that we used for the financial analysis, so that is takes into account the same risk level evaluated for the project. From the sum of the discounted values, we obtain the (Social) Present Value. Values are reported in the following table.

			Year 1 1	Year 2 2	Year 3 3	Year 4 4	Year 5 5
Social Impact	Employees	Job creation (self)	€ 437'500	€ 437'500	€ 437'500	€ 437'500	€ 437'500
	Neighborhood	Increase local economy	€ 390'000	€ 2'300'000	€ 3'700'000	€ 3'700'000	€ 3'700'000
	Government	Unemployment rate, less subsidies	€ 150'000	€ 150'000	€ 150'000	€ 150'000	€ 150'000
	Government	Increased taxes for governement expenses	€ 13'000	€ 530'000	€ 800'000	€ 920'000	€ 930'000
	Universities	Stimulus to research	€ 21'600	€ 21'600	€ 21'600	€ 21'600	€ 21'600
	Entrepreneur Team	Higher satisfaction	€ 42'000	434'000	1'190'000	1'141'000	1'456'000
	Investors	Economic return	€ 18'000	186'000	510'000	489'000	624'000
Environmental Impact	Environment (Air)	Avoid incineration of plastic waste	€ 81'930	€ 81'930	€ 81'930	€ 81'930	€ 81'930
	Environment (Land)	Avoid dumping of plastic waste	€ 389'689	€ 389'689	€ 389'689	€ 389'689	€ 389'689
	Environment (Land)	Avoid oil consumption for virgin polymers production	€ 3'914'141	€ 3'914'141	€ 3'914'141	€ 3'914'141	€ 3'914'141
	Environment (Energy)	Less power consumed	€ 195'610	€ 195'610.42	€ 195'610.42	€ 195'610	€ 195'610.4
	Environment (Water)	Less oil spills	€ 12'900	€ 12'900.24	€ 12'900.24	€ 12'900.24	€ 12'900.24
	Total Impact		€ 5'666'371	€ 8'653'371	€ 11'403'371	€ 11'453'37	€ 11'913'37
	Discount Rate	12%	12%	12%	12%	12%	12%
	Present Value		€ 5'059'260	€ 6'898'414	€ 8'116'694	€ 7'278'824	€ 6'759'986
	Total Present Value		€ 34'113'158				

From the Present Value and the initial Investment, we obtain the Net Present Value. The SROI is then calculated. We can than calculate two further parameters, i.e. the Discounted Payback Period, indicating the time after which the social investment is repaid, and the Internal Return Rate.

As a result of the SROI Analysis we can produce the following set of metrics, comparing "financial" and "sustainable" values:

	Financial Return on Investment	Sustainable Return on Investment
Present Value	9'375'000 €	34'113'158 €
Investment	310'000 €	682'000 €
Net Present Value	9'065'000 €	33'431'158 €

[15] According to the "Mississippi Department of Environmental Quality": www.deq.state.ms/MDEQ.nsf/page/Recycling_RecyclingTrivia?OpenDocument

[16] According to "Commodity Exchange Bratislava" www.carbonplace.com on 2nd December 2013. See also co2markets.co.uk. EAU = European Allowance Unit, corresponding to 1t of CO_2.

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Return on Investment	29	49
Discounted Payback Period	14 months	45 days
Internal Rate of Return	282%	880%