

Assessing Social Return (A): Regale Corporation

Twelve years after first exploring the opportunity to develop a new technology that promised to revive the flagging molded fibre packaging sector, Regale's founder – Greg Gale – was poised to begin a major program of expansion which would see up to 30 new small-scale manufacturing plants developed over 4 years. Greg calculated that the expansion plan offered investors a project net present value of \$ 1 bn, and generate a social net present value of an additional \$ 1bn.

Greg knew that his proprietary technology had considerable economic, environmental and social advantages over the competition. He believed that investors would be attracted to the potential to generate social returns in addition to his financial projects. As such, Greg sought to quantify all of the benefits that his bold plans would generate and to include this information in his business plan.

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Regale Corporation was a design and technology driven manufacturer of molded fibre packaging products. For 11 years, Greg Gale had developed and refined a revolutionary, proprietary technology that promised to bring new life to moulded fibre packaging, an industry that had been in serious decline over the past 20 years.

He estimated that the value of the packaging industries was more than \$550 bn. This included molded fibre, plastics and foam packaging products. All users of packaging were under pressure to reduce environmental impact, one reason why Greg believed he could capture 15% of the total market by 2007.

Gale's new technology had attracted a great deal of interest from blue chip beta customers who recognised its potential as a low-cost, flexible, environmentally sensitive solution. These ranged from packaging for wine bottles and glasses to protection for sensitive computer components.

By mid 2001, Greg Gale was seeking a considerable expansion of Regale's operations, a rollout of 30 dedicated manufacturing facilities across the USA. Until that time, Regale had been operating from a semi-research oriented facility in California. He had a series of MOUs, purchase orders and advance purchasing agreements, which were the driving force behind his ambitious 5-year production targets.

As the expansion plan was prepared to attract investors. Regale's management team was keen to emphasise the social benefits they believed their expansion program would bring in order to raise funds from the social venturing community. In addition to the environmental benefits, they believed that the plants, to be established on

a 'Township Model', would generate important community benefits. From their perspective, the social benefits were a substantial addition to the clear economic and environmental benefits flowing from Regale's proprietary technology.

The birth of Regale

Molded fibre was developed in the 1890s and was widely used as protective packaging for transporting perishables such as eggs and fruit. This was the industry standard until the late 1950s when Expanded Polystyrene was introduced as a new packaging medium, followed by Polyethylene foam.

In spite of being more environmentally friendly, the molded fibre industry was unable to compete with petrochemical-based packaging technologies, due to extremely high tooling costs, packaging design limitations and an expensive drying process.

In 1990, Regale's founder - Greg Gale - began investigating the potential to revive the molded fibre sector. He was attracted by its low raw material cost (molded fibre relies on pulp from recycled paper) and the environmental benefits associated with its use of recycled materials. With landfill costs standing at about \$0.70 per ton, there appeared to be clear savings from re-use of materials of this kind. Moreover, as a packaging material, molded fibre had much to offer because it was more flexible and therefore could form curved shapes.

Gale's challenge was that the tooling and drying costs for each new design were exorbitant. After exploring the problem over several years, he successfully managed to design a process that dramatically reduced the time and expense involved in designing and changing new tooling for different molds. Moreover the molding and drying stages of the new process were efficiently

integrated in a closed loop process involving minimal waste of water and materials. Even some of the heat used in the molding process was recycled for re-use in the drying process.

The Regale process

Under the Regale process, wet molded articles were formed in the same manner as in the more traditional molded fibre process – a toolset mold was immersed in paper pulp-fibre slurry. A vacuum formed that pulled water through the toolset, enabling the fibre to build up within the mold. Using a conventional process, the molded article would then be removed from the toolset and transferred to a convection oven conveyor.

The Regale process involved the entire toolset and molded article being placed in a sealed drying chamber into which compressed, heated air was introduced – the vacuum pulled the air through the wet molded article. Using this method, the entire drying process took under one minute. The key competitive constraints were therefore removed by using these new production and drying processes.

The Regale approach also used existing “rapid prototyping” technology combined with Regale’s patented tool building process to build an average tool in 12-36 hours. This reduced tool fabrication development time by 80% and costs by 90%.

The Regale closed loop process was designed so that almost all of the raw materials were retained in the finished product with no emissions of raw material to effluent, sewer or air. The only solid waste material released results from a filtering operation to clean up the water loop every three months. The loop water was fed through a fine filter and the collected waste

amounted to about 50 tons of solid waste per year, 0.01% of the processed material, which was then released to a waste incinerator. There were negligible wastewater emissions,

an important comparison to the average paper mill that released at least 200,000 tons of high BOD/COD wastewater per year on a 10,000-ton capacity.

Social and Environmental benefits

In contrast to packaging materials made of petrochemical-based products, Regale did not use fossil-based, non-renewable raw materials therefore its products did not contribute new carbon dioxide to the environment. This was quite a contrast to estimates of about 3.5 tons of CO₂ released into the atmosphere for every ton of product produced using petrochemicals.

Gerrit van Roekel, principal at SVT Consulting worked with Regale to assess the potential for positive social and environmental impact. He believed that carbon credits would be expected to trade for \$2.50 per ton of CO₂ emission avoided in the very near future. He expected that Regale’s process would attract considerable interest because of environmental benefits and cost savings.

Regale’s products could be fully recycled in any subsequent paper recycling process, although with an average of 50% of post consumer waste subject to recycling in the US, it was likely that half of Regale’s output would still be committed to landfill, where it would be subject to landfill disposal or incineration costs of about \$0.70 per ton.

Gerrit based his impact analysis on the premises that each proposed plant would achieve a maximum efficient scale of about

10,000 tons of output per year. Regale was deliberately targeting factories of this size in order to develop the 'Township Model' of locally oriented factories, which created employment for local people and generated new business for local suppliers.

From an environmental perspective, Gerrit estimated that on average about 40% of output would directly substitute other waste paper-based molded fibre products owing to the superior economics of the Regale process. An additional 40% of output would substitute petrochemical-based products. The remaining 20% was projected to come from serving new market niches not currently served by petrochemical or traditional molded fibre processes.

In terms of energy consumption, Gerrit knew that the Regale process involved energy consumption of about 500 kW/ton of packaging material produced, and it was estimated that 68 tons of CO₂ would be emitted for every 100,000kW of energy consumed. This process used 40% less energy than a traditional molded fibre production process, and about the same as a plastic packaging material plant.

A Regale plant represented a \$23 million investment, of which approximately \$2.5 million would be paid out to local contractors as a plant was built. In addition, about \$0.5 million in maintenance and additional contracting work was projected each year. A typical Regale plant would employ about 61 workers at average salaries of about \$60,000. 51 employees would be performing low skilled jobs directly involved in product manufacture.

Given the economic conditions prevailing in the localities where Regale was planning to locate its plants, Gerrit estimated that 20 of each factory's employees would otherwise be on welfare, receiving \$15,600 each in state unemployment benefits. With materials and services sourced from the local area, Van Roekel hoped that each Regale plant would be able to support as many as 500 jobs locally once these ancillary services were considered.

Once a plant was set up, each plant was likely to be subject to property tax of about \$0.2m per year, and to incur local sales tax of 1%, translating to an average tax payment of approximately \$0.415m per year.

Greg was excited by the technology that he had developed over the last decade, but was also keen that Regale's growth plan be valued for the environmental and social benefits that were a direct result of the production process, as well as on its technical merits.

As he finalised the plan, and reviewed Gerrit's impact analysis, Greg wondered whether the true value of the social and environmental benefits the expansion would generate could be captured. He questioned whether the social impact numbers would add significant value to his financial projections and how potential investors would react to the numbers the business plan proposed.

APPENDICIES:

Financial Projections (year ending 30th September, 2002)

	2002 F	2003 F	2004 F	2005 F	2006 F
Manufacturing facilities *	4	7	14	24	30
Revenue (\$000s)	4,910	48,806	175,065	355,757	559,800
Net income (\$000s)	(442)	8,539	50,063	112,098	182,336
Cash (required)/generated (\$000s)	(3,663)	(3,837)	27,573	93,487	169,826
discounted cash flows at 12%	(3,663)	(3,426)	21,981	66,542	107,927

* includes current Napa facility

This projection is based on a total of 30 plants to be established over a five-year period. At a typical 12% small business discount rate the projected cash flows net to a total project NPV of \$ 992.5 million, mainly from the 2007 terminal value of the 30 plant project¹. The Social Net Present Value of this project amounts to \$ 998.0 million in perpetuity. The total project NPV including SNPV therefore is \$ 1.980 billion.

For 30 manufacturing facilities:

(million \$)	NPV
Financial Net Present Value (12%)	992.5
Social Net Present Value	998.0
Total Project Value	1,980.5

SNPV Breakdown

Impact	SNPV		Risk	Influence
	One plant	30 plants	Discount rate	
Waste paper	2.55	53.2	20%	No influence on disposal fees, nor on carbon credit value development
Solid waste & other emissions	0	0	-	
Energy savings	≈ 0	≈ 0	-	
Renewability	0	0	-	
Recyclability	1.32	27.5	20%	No influence on disposal fees, nor on carbon credit value development
Township model	43.55	907.3	12%	Regale has 100% influence on the plant scale decision
Total SNPV	47.42	988.0		million \$

¹ Terminal value estimate derived from indefinite no-growth 2007 cash flow

Township Model SNPV

M\$ per plant	FY 02	FY 03	FY 04	FY 05	FY 06	Terminal
Plant establishment	0.5	0.5	0.5	0.5	0.5	0.5
Wages ²	3.528	3.581	3.635	3.689	3.745	3.801
Reduced welfare	0.317	0.321	0.326	0.331	0.336	0.341
Taxes	0.415	0.415	0.415	0.415	0.415	0.415
Total impact	4.760	4.817	4.876	4.935	4.996	5.057

NOTE FROM REGALE'S SNPV SENSITIVITY ANALYSIS

Our analysis attributes 92% of the calculated Social Net Present Value (SNPV) to the township plant model. The majority of this value (74%) is derived from incremental wages disbursed in to the host community. We think the dollar value of these wages is accurate and has little risk, and the 12% discount rate reflects the relatively small risk of loss of these wages due to failure of the business. Whether to count the full wages or not is a conceptual question, which is difficult to express in a discount rate. The remaining 8% of the SNPV depends largely on the actual value of carbon credits offered by Regale because of the additional material recycled or the avoided use petrochemical materials. The various sources predict values ranging from \$ 0.20 to \$ 25, so our assumption of \$ 2.50 is on the low end of the range. We think that the 20% discount rate adequately reflects the risk in this value.

² Assumed general real annual wage growth 1.5%