

**Establishing a
Manufacturing Plant in Africa:
Owens Corning & Botswana**

DRAFT

Damien Shiels & Debora Spar

**The Foreign Investment Advisory Service
Occasional Paper Series**

Introduction

After two years of deliberations Owens Corning made the decision to set up its first manufacturing venture in Southern Africa with an investment of US\$12 million in 1992. The plant would produce large diameter glass reinforced plastic (GRP) pipe to supply the regional market.

On a global scale, Owens Corning's investment in Botswana was by not a very large one. Yet in a region where manufacturing investment by foreign multinationals is relatively rare, this exception to the rule is both interesting and important. A recent article in *Business Africa* noted the Catch 22 situation sub-Saharan Africa faces in attracting foreign direct investment (FDI). "The continent needs FDI to grow and create larger markets and highly competitive exporters. But because the continent's markets – with the exception of South Africa – are so small, and because it is so far behind in terms of skills and technology, Africa continues to be marginalized by foreign multinationals except when it comes to natural resource investment for export."¹

While Owens Corning was planning and gathering details for its investment during the late 1980s and early 1990s Africa stood out from other regions in terms of its investment flows. In other groups of developing countries FDI and portfolio investments were flourishing while in Africa they could, at best, be described as weak. At that time, FDI rose to comprise the largest component of net resource inflows in both Asia and Latin America yet Africa still relied mostly on grants and official loans.²

When investment does arrive in Africa there is over a sixty percent chance it will be headed for the natural resource sector. The continent's nine oil-exporting countries³ accounted for two thirds of the FDI flows to Africa at the beginning of the 1990s. More importantly, Egypt and Nigeria received fifty percent of the total flows to the region and seventy-five percent of the flows to the nine oil-exporting countries mentioned above.⁴ Statistics from the International Finance Corporation (IFC), the private investment arm of the World Bank Group, tell a similar story. As the single largest source of foreign equity and loan capital in sub-Saharan Africa, IFC investments in manufacturing accounted for only nine percent of their total portfolio for that region, while mining and oil comprised fifty percent⁵. Considering the IFC's mandate to foster development, these numbers point to the scarcity of viable opportunities for foreign investment in the manufacturing sector.⁶

With an initial investment of US\$12 million in 1992 Owens Corning made the decision to venture into a region where many of their multinational peers would not tread. The glass reinforced plastic pipe (GRP) plant was built in the suburbs of Gaborone, Botswana's capital. Even after early expansions brought the total investment to US\$18 million, it was clear that the real value of the plant to the country went well beyond mere financial tallies. The sophisticated manufacturing

¹ Anon. "Foreign Investment in Africa." *Business Africa*. The Economist Intelligence Unit. London. October 16-31, 1997. Pages. 1-3.

² UNCTAD *Foreign Direct Investment in Africa*. United Nations. New York, 1995. p22.

³ Algeria, Angola, Cameroon, Congo, Egypt, Gabon, Libyan Arab Jamahiriya, Nigeria, and Tunisia.

⁴ UNCTAD *Foreign Direct Investment in Africa*. United Nations. New York, 1995. p22.

⁵ Bennell, Paul. "Foreign Direct Investment IN Africa: Rhetoric and Reality." SAIS Review. Washington, D.C. Summer-Fall 1997, p136.

⁶ Ibid.

process, involving everything from the manipulation of polymers to computer-operated machinery, to a state-of-the-art testing facility all required that labor be specially trained. Regional demand would orient a significant portion of production towards exports. Most importantly, at the time of the decision to invest there were very few foreign companies of comparable size and none with the international profile of Owens-Corning present in the country.

The catalyzing effects of the investment were also impressive. A case in point happened in 1998. Mr. Lemar, who is now general manager of the plant, hosted several members of the U.S. presidential delegation when they arrived in Botswana as part of President's Clinton's African trip. This stemmed from Owens Corning's status as a U.S. multinational and served to attract further attention to the country as an investment site.

The exceptional nature of the investment in the regional context provides reason enough for an examination. Yet beyond the question of why Owens Corning dared to tread where others would not, lie a host of valuable insights on how and why an investment decision is made. This analysis also probes the actions Botswana officials took that affected the decision process. The resulting story on how Owens Corning arrived in Botswana will not reveal any strategic shortcuts countries can employ to fortify their stock of FDI. Instead, it will reinforce the importance of an effective investment environment and a transparent policy framework.

Notwithstanding the stark differences in approach, the lessons that can be distilled from studying this case will add to and reinforce many of those that arose in a previous study of Intel's investment in Costa Rica⁷. Yet at the

same time, the contrast between the companies and their methods will open up new areas for discussion. Owens Corning does not share the glamorous profile of a high technology pioneer and leader, and may in fact be a better representative of the average manufacturing multinational. It did not compare and contrast numerous locations to arrive at its decision. Instead, the company was introduced to a business opportunity in Botswana with the potential for regional exports and pursued it. Going ahead with the investment was never a forgone conclusion, however. Botswana had to pass muster with the management of Owens Corning and the many guidelines they had established over the company's 50 year history.

The discussion of the investment is broken down into three parts. The first section examines Owens Corning, their position in the market and their reasons to expand internationally. The second chapter takes a chronological look at the site selection process, beginning with the negative impressions left after Owens Corning's first disastrous venture in Africa, and then moving to the decision to invest in Botswana. The third chapter takes a more analytical stance and examines the reasons behind Owens Corning's, the Government's and other parties' actions and the lessons that can be derived from this case study.

⁷ Spar, Debora. *Attracting High Technology Investment*:

Intel's Costa Rican Plant. Foreign Investment Advisory Service, Ocasional Paper No. 11. The World Bank, Washington D.C. 1998.

Marketing Glass Fiber: Owens Corning and GRP

Founded in 1938 as a joint venture between Owens-Illinois Glass Company and the Corning Glass Works, Owens Corning is one of the world's largest suppliers of glass fiber and related products, services and systems. Today, Owens Corning is a \$5 billion publicly held company, employing over 20,000 people in more than 30 countries worldwide. Born from a small innovation in glass filament, Owens Corning now offers a diversified array of products including complete building materials systems, advanced glass fiber, and large diameter pipe.⁸

Establishing the GRP Pipe Business⁹

Glass reinforced plastic (GRP) pipe is one of the more recent developments in pipe technology. It is primarily used in water related infrastructure projects and presents several benefits over conventional steel and concrete. Aside from its lighter weight and maneuverability, GRP is also easier to install and incurs lower transportation costs.

In the mid-1960s, EPS Technologies Norway developed glass reinforced plastic (GRP) pipe technology in conjunction with Uten, a leading Norwegian manufacturer of polyester resin which was looking for new polymer business. The pair began producing GRP pipe and tanks in 1968, the same year Owens Corning began manufacturing glass fiber in Belgium.

Looking for additional applications and products employing glass fiber, Owens Corning purchased one of

the production lines in 1970. This initial agreement was followed by four years of joint research and development at Owens Corning's facility in Texas, where the technology was further refined. Confident that this new product had merit, Owens Corning formed a joint venture, dubbed VERO, with the Norwegians in 1976. More recently Owens Corning bought out 90% of the joint venture, renaming it Owens Corning Engineered Pipe Systems (OC-EPS) and relocated to Brussels, Belgium. The product was a logical step for OC, which used pipe as another means to sell glass filament, the centerpiece of its operation.

OC's pipe is a filament wound, structural composite made with glass fiber and polyester resins. Owens Corning manufactures and sells GRP pipe directly to governments, contractors and private industrial concerns for major infrastructure projects, primarily for the transport of potable water and waste water¹⁰. Based on this product, Owens Corning has been an industry leader for many years in GRP.¹¹ It is also the largest end-use product manufactured by OC. Exploiting these advantages, Owens Corning's Engineered Pipe Systems (EPS) unit manages a number of manufacturing facilities around the world and has supplied pipe systems into more than 40 countries throughout the Middle East, Africa, Latin America, Europe and Asia Pacific. The EPS division, headquartered in Brussels currently operates wholly owned facilities in China and Norway, and has joint ventures in Argentina, Botswana, Columbia, Egypt, Germany, Spain and Turkey. In addition, EPS has affiliated operations in Saudi

⁸ Owens Corning 1997 Fact Book, page 4.

⁹ Appendix 1 provides a thorough description of plastics, composites and GRP

¹⁰ Ibid., page 50.

¹¹ Ibid., page 50.

Arabia, India and Thailand, and holds technology licensing agreements in a number of other countries.¹²

The Global Pipe Market & International Expansion

In 1996, the total global market for large and small diameter pipe was \$70 billion with the bulk of demand driven by infrastructure projects in Latin America, Asia Pacific, Africa, and Central and Eastern Europe.¹³ Although composite materials, such as GRP, have begun to gain broader acceptance and be specified by engineers and consultants in project requirements, traditional materials still dominate. In water systems using large diameter pipe, for example, ductile iron and steel represent almost 70% of the market.¹⁴ While in sewer pipe systems concrete is still the material of choice. GRP is gradually gaining more acceptance. Traditionally, its main constraints had been cost and limited acceptance due to its relatively recent introduction to the market.

The transition for GRP occurred in the late 1980s. By 1987 Owens Corning had refined the production process and cut the cost of inputs resulting in a drop of 40% in total manufacturing costs from 1980 levels. This considerably increased the number of potential customers. Previously affordable only to wealthy nations who could justify a 40-year payback, GRP was now feasible for infrastructure projects in developing countries also.¹⁵ As a consequence, Owens Corning was ready to expand operations more aggressively in a larger number and variety of countries.

After a brief setback, where the company had to fend off a hostile takeover bid, Owens Corning began a campaign to expand GRP operations. The push was aided by a new CEO, Mr. Glen Hiner, a twenty year veteran of General Electric. His vision was to expand operations internationally. With the cost saving in the manufacturing process more countries could take advantage of GRP pipe. Owens Corning would not only benefit from the pipe sales but also from the sales of glass filament, the primary input for the pipe. As a means to contain risk, however, his business development team was to concentrate on joint ventures rather than greenfield opportunities. The 1992 investment in Botswana was one of the first joint ventures approved by Owens Corning under this new international growth mandate. It contrasted starkly with Owens Corning's first step into Africa in Nigeria that occurred several years earlier.

¹² Ibid., page 50.

¹³ Ibid., page 51.

¹⁴ Ibid., page 51.

¹⁵ Ibid.

Expanding in Africa: the Road to Botswana

Foreign multinationals often have interesting stories to recount about their initial experiences in Sub Saharan Africa. Owens Corning is no different. Its debut in Africa took place in Nigeria following the urging of a local business consortium. In the early 1980's a team was sent to undertake a feasibility study. It subsequently established an office in Lagos to determine the opportunities for GRP and whether a market for the product could be developed. After spending two years and over \$1.5 million, Owens Corning withdrew from the market. To use the words of one of the company's executives, "Owens Corning got burnt, badly."¹⁶ The most immediate culprit forcing Owens Corning out of the country was the pervasive corruption that existed at various levels of the government and business communities. Being a U.S. multinational, Owens Corning could not pay the required bribes to undertake business without being subject to possible legal action back in the United States. After attempting to conduct research and business cleanly for several months without any success, the company decided to withdraw the team and close down the Lagos office. Owens Corning would instead concentrate on opportunities in Asia, Latin America and the Middle East. Understandably, Owens Corning was left with a bitter aftertaste. Half a decade passed before Africa was mentioned again within Owens Corning as a potential site for a GRP plant.

OC's reintroduction to the African region eventually came from three separate sources, almost simultaneously. Besides the Engineered Pipe Systems team within Owens Corning itself, the two others included Mr. Bryan Lemar, the

plant manager for a PVC pipe operation run by Murray & Roberts in Botswana and the Norwegian Trade Commission (NTC).

As general manager for the only PVC pipe plant in Botswana, Mr. Lemar had crucial access to information on local demand. Through the plant's parent company, Murray & Roberts, with their operations in South Africa, Zimbabwe, Malawi, and status as South Africa's largest pipe producer, he also had insights on the larger, regional demand for pipe. Lemar's preliminary research uncovered a marked increase in planned infrastructure projects in the region for the coming decade, particularly within the water sector. Many of these water projects would require larger diameter pipes than would be technically feasible for PVC, and therefore might produce new business opportunities for Murray & Roberts. Murray & Roberts already had extensive experience with ductile iron and concrete piping; however, they had an interest in further developing their GRP production capabilities.

GRP had several advantages. Most importantly it was cheaper to produce and install than iron or concrete – a crucial consideration for governments tendering infrastructure contracts. (Box 1 outlines some of the advantages of GRP over both ductile iron and concrete pipes). Taking into consideration the benefits of GRP and the opportunity to expand Murray & Roberts' operations into new areas of the pipe market, Lemar concluded that any new production plant should be a GRP facility. Without any expertise in GRP manufacturing Murray Roberts would either have to license from, or partner with, an established producer. Lemar's task was to find a compatible producer.

¹⁶ The executive asked to remain anonymous.

Box 1: *Evaluating GRP*

GRP enjoys some special physical characteristics that are particularly useful in the water transportation market segment. First, GRP offers a high tensile strength to weight (mass) ratio. On a pound for pound basis, fiberglass yarns are twice as strong as steel wire. Further, glass will not shrink or stretch as a result of changes in environmental conditions and exhibits no more than nominal 3% elongation under maximum stress. Glass fiber, like glass itself, is highly resistant to attack by most chemicals. Finally, glass fiber is a non-cellular material, hence moisture cannot penetrate the surface of the filaments.¹⁷

When incorporated into piping systems, these characteristics of glass fiber add substantially to the competitive product offering. Notably, GRP has several distinct advantages over competing products;

Weight – GRP pipe is typically 20% the weight of steel, 10% the weight of concrete and iron.¹⁸

Shipping Costs – A single flatbed truck can carry six 18-meter lengths of GRP for a conduit/truckload of 108 meters. This compares to only four 12 meter steel pipes or 48 meters in total conduit/truckload, yielding an estimated 56% savings in shipping costs.¹⁹ Though GRP is inexpensive to transport over ground, the expense of sea shipment adds approximately 20% to the overall product cost.

Installation Time – installing an 18-meter length of pipe in a recent infrastructure project in Africa took an average of 20 minutes, with approximately 9 minutes to complete the double bell coupling (linking) process. Steel, in contrast, needs to be welded together, which takes approximately two hours per connection.

Corrosion Resistance – GRP is also non-porous and highly resistant to attack from most chemicals, whereas steel and iron require expensive cathodic protection or other pipe coatings.²⁰

Longer Lengths – Because the pipe can be made in longer lengths, the pipe has fewer joints for greater efficiency and lower inspection costs.²¹

Better Surface Flow Characteristics - Because the interior surface of GRP is more smooth than steel or iron, there is lower pumping energy necessary to move the fluids through the pipeline. This also reduces slime buildup and requires less frequent cleaning.²²

Price – Overall installed cost for GRP is estimated to be 30% cheaper than ductile iron and 5-10% than steel.²³

At this point a strange but crucial player entered the picture. It was the Norwegian Trade Commission (NTC) and

it proved to be the catalyst in Lemar's search. Traditionally, Norway had strong aid relations with the region and had

¹⁷ Anon. "Characteristics of Fiber Glass Yarn," Website: <http://www.ppg.com>. PPG Industries Corporation, Pittsburg, U.S.A. website.

¹⁸ Ibid.

¹⁹ Ibid.

²⁰ Anon. "GRP pipe benefits from Africa's water shortage," *Reinforced Plastics*, Elsevier Plastics Ltd. Oxford, U.K. September, 1997, p. 23

²¹ Wolfe, Pamela. "Botswana's 360-km pipeline project makes headway," *Water & Wastewater International*, PennWell Publishing Co. Tulsa, OK, U.S.A. August, 1997, p.17.

²² Ibid., page 17.

²³ Fairweather, Virginia. "Water Works," *Civil Engineering*, American Society of Civil Engineers. New York, U.S.A. p.59.

placed a number of engineers in various countries to develop basic water planning schemes. Through these contacts and Norwegian embassies in the region, the NTC also became aware of the increasing number of water-related infrastructure projects and provided feedback about these projects to Norwegian companies. Having come to the same conclusion as Mr. Lemar about the business potential for larger diameter pipes, they then hosted a meeting in Botswana in March of 1988 to discuss potential business in the region. Mr. Agnar Gilbu, Owens Corning – Engineered Pipe Systems’ site selection manager and a Norwegian citizen with good contacts at the NTC, was invited to attend. Prior to the invitation, Gilbu had been monitoring the region’s potential. Falling manufacturing costs for GRP recently made the pipe a more attractive option for infrastructure projects in developing countries. Though still harboring concerns about the region based on Owens Corning’s Nigerian experience, he traveled to Botswana.

Mr. Lemar, who was also invited to the event, was introduced Mr. Gilbu and their obvious common interest led them to further discussions. In the coming months Mr. Lemar and Mr. Gilbu worked informally to assess the potential for both a plant and a joint venture between Owens Corning and Murray Roberts. The focus, in terms of a potential location for the project, was almost exclusively on Botswana, where Lemar ran Murray & Roberts’ PVC plant. Initially, local demand, logistics and the business environment also seemed to weigh in favor of Botswana.

Intrigued by the possibility that Lemar had presented, Owens Corning undertook its own internal preliminary feasibility study, hiring a Swedish consultant, Mr. Oleg Ulson to work with Mr. Gilbu. Ulson had spent several years in the region, first as an employee of the Swedish international aid agency and then

as a private businessman, and was aware of both the opportunities and the local business environment. The conclusion of both Owens Corning’s internal study and Gilbu’s work with Lemar justified their early inclination towards Botswana. Before an investment or joint venture could take place, however, Gilbu would have to clearly define the project and then complete a 901 report, Owens Corning’s internal site selection framework document.

Based on early estimates of demand and operations already established in other countries, the plant would require between 40,000 and 50,000m² of land. The manufacturing facility itself would measure 3000m² and house at least one “E-1 winder” (a GRP pipe production machine). The machinery would be sourced from Owens Corning’s Norwegian subsidiary, VEROX Technology. With one machine the plant could produce a maximum of 110 to 130km of pipe a year, in diameters ranging from 300mm to 2400mm. Beyond piping, the facility would also be equipped to produce tanks for water and petroleum storage. Operational 24 hours a day, the facility could require over 100 employees working on a three shift schedule. Electric consumption for a single-machine facility would run at 100kw per hour. Finally, the plant would consume 750 tons of Owens Corning glass fiber when operating at full capacity.

The framework for deciding whether these requirements could be met in a host location was contained in Owens Corning’s “901 Report”. This formal feasibility study which covers all aspects of the host country’s economic and political environment, regional demand for pipe, and economic returns to the company is required for Board approval of any investment. General topics such as the country’s political and economic stability, investment climate, industrial structure and service industries are

surveyed to get a broad picture of the business environment. Following this general overview, the report estimates the size and scope of any potential project, including financial forecasts, the identification of potential joint venture partners, and operational factors associated with production (labor, infrastructure, capital equipment, and environmental issues).

The team assigned to prepare the report usually consists of a high level Owens Corning executive and one or more consultants with experience in the selected market. In the early stages of Owens Corning's international expansion, additional consultants that specialized in plant design were also present for much of the process. This changed as the company gained more experience and eventually the site selection team worked with standard packages for constructing GRP pipe plants of all sizes. The team spent anywhere from six months to a year to complete the 901 report which was then distributed to Owens Corning executives, with final approval coming from the CEO.

Gilbu would head the 901 study on a potential plant in Southern Africa, with Lemar and Ulson providing inputs at different periods. The team did not generate long lists and short lists of potential sites, a common practice in site selection by multinational corporations. Instead, both potential partners, Owens Corning and Murray & Roberts, seemed set on Botswana from the start. At first glance, the country appeared stable, housed sufficient local demand, and would serve as an adequate export platform for the region. The 901 study, built from several decades of experience, would test Botswana's ability to host the investment. The country would have to win the investment by living up Owens Corning's internal standards and expectations. If after thorough investigation Botswana proved unsuitable,

then the entire investment would have to be rethought. This never happened.

Thus, what began as a fortuitous call from the Norwegian Trade Commission quickly paved the way for Owens Corning's return to a region they had vowed to avoid. Now Owens Corning would have to carefully examine all aspects of the country to avoid a repeat of their experience in Nigeria. To assist him in this process, Gilbu had in Ulson and Lemar two exceptionally well versed sources that had lived and operated businesses in the region. Their insights and relationships with political leaders provided a clear picture of which countries possessed the most politically stable environments. Both supplemented their accumulated knowledge through interviews with politicians and businessmen that had been arranged specifically to address Owens Corning's questions. This mix of talent produced a solid foundation of information on which Owens Corning management could base its decision.

Assessing the Regional Market

An early conclusion of Owens Corning's inquiry was that South Africa would be the most significant market in the region for large diameter piping with estimated demand running close to 600km a year in the 1990's. Its neighbors to the north, Botswana, Namibia and Zimbabwe had all just emerged from painful droughts and were planning large scale irrigation and water pipeline projects. The most notable of these was Botswana's own North South Carrier Project (NSC). Based on a 15 year study of rainfall and water usage by the Government of Botswana, it planned a \$600 million, 380 km pipe, to transport water from the northeast corner of the country to the drought-prone, heavily populated, southeast corner. When this project was

added to the general public sector pipe requirements, the entire pipe sector was expected to grow by an average of 33% between 1988 and 1994. Namibia and Zimbabwe had similar projects in planning though they were not as well articulated as the NSC.

Clearly, then, the demand existed. The more important question was whether these countries had the resources to fund these large projects. The NSC project, for instance, was part of the Botswana government's National Development Plan number 7 (NDP7). NDPs are six-year-cycle public expenditure guides which are produced by the cabinet and then approved by the parliament. Although not binding they have become an extremely accurate guide to future public expenditures, including all state-sponsored infrastructure projects.

Lemar was already aware of the reliability of previous NDPs. Yet he still confirmed the Government's commitment through meetings with the Department of Water Affairs and different ministries that would be involved in funding and implementing the NSC project. Citing the grave water shortages over the past few years and the imperative to supply the arid industrial and population center of the country in the south, the Ministers assured Lemar that the NSC would proceed as planned. Underlining the gravity of the need, the Government had even considered moving the capital from the South to the West of the country. However, this initiative was scrapped because of Gaborone's proximity to South Africa's industrial center surrounding Johannesburg.

Whereas Botswana could afford projects of this dimension from its healthy public sector budget, Zimbabwe and Namibia were on less secure financial footing. Funding for similar projects in Namibia and Zimbabwe would come from a variety of sources including the government, international lending

institutions and international aid agencies. Enough of these projects had already been approved and funding secured that they could be counted on as valid sources of demand. With its diversified industrial base and status as Africa's wealthiest nation, South Africa would most likely have sufficient infrastructure capital. However, this market, while large and well financed, would pose a problem for other reasons: domestic competition and industrial protectionism. Notwithstanding the potential difficulties in penetrating the South African market there was clearly enough evidence of demand and financial backing to continue the analysis.

After verifying demand, the next step was to confirm whether a physical presence in Botswana would be necessary. In other words, would it be more cost-efficient to supply the region with imports from already established plants or set up a new operation in the region? The nearest locations from which the countries of Southern Africa could be supplied were all in Europe. Although companies like Pont'a'Mousant were already supplying the region with large diameter pipe from their plants in France, local production appeared to be the more logical choice for Owens Corning. The central problem with transporting pipe such long distances is its extremely low weight to volume ratio; in most cases the company is paying to ship a lot of air. Initial calculations by Owens Corning suggested that transportation of finished pipe would add around 15% to total costs. Another less tangible factor favoring their presence would be the perception of their pipe being a locally produced product. This was important to Owens Corning because much of the plant's production would be supplying government concessions contracts throughout the region.

The prospect of large pipe projects and Botswana's central location in the region could be significantly outweighed if there were difficulties in the importation

of inputs or accessing export markets. Given significant regional demand for pipe outside of Botswana, Owens Corning wanted to have the ability service neighboring countries to efficiently and cost-effectively. The Botswana Government realized early on the need to emphasize exports given its small domestic market of 1.3 million people and strategic central location in the Southern African region. Botswana's inclusion in the Southern African Customs Union (SACU), a free trade area consisting of South Africa, Botswana, Namibia and Lesotho, enhanced Botswana's potential as a hub for regional exports. A bilateral trade agreement with Zimbabwe allowed goods with 25% Botswana local content to qualify for duty-free import into Zimbabwe. Good relations and transport links with its neighbors made border crossings from Botswana easier than from neighboring countries such as Zimbabwe.²⁴

Lemar also proposed that Owens-Corning should look to capture 20% of the South African market over time. This appeared feasible given that the proposed plant was to be located within 400km of the Guateng region of South Africa, which accounted for 40% of South Africa's GDP. Initial discussions of expanding SACU to the ten country Southern African Development Community (SADC) had already taken place and would only improve Botswana's attractiveness as an export base.

With the economics and informal review favoring local production Owens Corning's next step was to assure themselves that setup and business costs, including political and economic risk, would also favor a local plant.

Political Environment and Stability

As one of the most general issues factoring into an investment decision, political stability is also the starting point for most companies considering an investment in a developing country. Much of the information that relates to this area can be uncovered through desk research, in the general press and specialized publications. However, Lemar's experience as a businessman already operating in the country helped the team get a more detailed picture of Botswana's political environment. With the Nigerian experience foremost on the minds of Owens Corning management, it should not be surprising that the political environment received the most attention.

Since its independence in 1966 Botswana has maintained an untarnished history of peace and sustained democratic elections. Although opposition parties exist, the dominant Botswana Democratic Party (BDP) has maintained an uninterrupted hold on leadership since independence. Yet the inclusive nature of the political process, with all sides encouraged to provide input before any major decision is taken, keeps political distress to a minimum. Because of the country's economic ties to South Africa, the government had to maintain a tricky equilibrium during the apartheid years, the net effect of which was an amazing propensity for conflict avoidance. Another intrinsic factor aiding political stability is the homogeneity of the population, with over 90% claiming Setswana-speaking Tswana descent. The remaining ten percent is made up of Basarwa (bushmen), Herero (from Namibia), Whites, and Asians.²⁵ Most notably for the Owens Corning team, the lack of ethnic tension within the

²⁴ *The Economist*, The Economist Ltd, London. June 14, 1997.

²⁵ The Economist intelligence Unit. *EIU Country Profile: 1997-98: Botswana*. Economist Intelligence Unit Ltd. London, U.K. 1997. P. 13.

population further translated into a receptive environment for foreigners. There was no inherent distrust or dislike of foreigners that decided to settle in Botswana; in fact, they were welcomed, even to take up politically powerful positions.

The most favorable aspect of the political environment in Botswana was the low level of corruption. During their initial meetings at the Norwegian Embassy it was this fact, more than any other, that sparked Gilbu's interest. After its disastrous experience in Nigeria, Owens Corning was actively seeking a low-corruption environment if it was to reenter Africa. Botswana delivered superbly. Already acknowledged by businessmen inside and outside the country as having one of the best, if not the best, reputation for low levels of corruption in Africa, it was apparent that the government was also constantly vigilant against this problem.

A recent high profile corruption case stands as testimony to the government's stance. When improper dealings were associated with the deceased head of the Botswana Housing Authority, the government launched a full investigation. Going one step further to ensure transparency and impartiality, they appointed a commission which included a foreign judge and elicited investigative help from several ex-Scotland Yard officials. The swiftness of the commission's institution and widespread political support for its findings clearly demonstrated the government's low tolerance for systemic corruption. The surprise and dismay within the general population that corruption of this kind had occurred in Botswana also stood as testimony to public perception that corruption was not a major problem in their country. This is not to say that Botswana is entirely corruption-free. Rather, its level and impact on business is significantly slight so as not to be a major

issue with the local and foreign businesses operating in the country.

Economic Performance

At independence, Botswana was firmly ensconced as one of the poorest countries in the world. With the discovery of diamonds in 1968, however, the country embarked on a rags-to-riches journey unparalleled on the African continent. Using diamonds as a foundation, the successive governments gradually and methodically built up the country, improving infrastructure, education, and other public services. Yet as any student of economics knows, the globe is littered with examples of badly managed natural-resource based economies. Botswana appears to have distinguished itself through a mix of fiscal prudence and an unrushed, methodical decision making process that is almost a hallmark of the Botswana. The result has been GDP growth that averaged 13% a year in real terms. At independence the average per capita income stood at US\$600. By the time Owens Corning was conducting its research, over two decades later, it had increased by 450% to over US\$3,100.

The cornerstone of this progress has been the National Development Plans (NDP). Created every six years after two years of planning and six months of parliamentary debate, they are made public and provide an organized framework for almost all public expenditures. During the planning process the government is notoriously conservative and extremely wary of incurring budget deficits. In fact, a budget surplus is generally the norm and has helped provide the country with over 20 months of import coverage, creating a substantial cushion to any downturn in the diamond's market. It was NDP No. 7 (1991-1997) which highlighted the

government's plans for industrial diversification and hopes for encouraging increased foreign direct investment (FDI). It was the same NDP that created the North-South Carrier project, a 360km water pipeline spanning the country, which proved to be a large enticement for Owens Corning.

The team from Owens Corning was impressed with the degree of economic organization and the obvious benefits that has for any business operating in the country. The push for industrial diversification, particularly in the manufacturing sector, gave Owens Corning additional encouragement. Botswana was a far cry from the disorder the company had encountered in Nigeria half a decade earlier.

Business Environment, Legal System, and Corruption

Although Botswana is small, landlocked, and decidedly limited in terms of technical expertise, the country has nevertheless managed to create one of the most open business environments in the developing world. When the team met with ministers and other public officials they were impressed by their honesty and commitment to improve. At the time of Owens Corning's research few restrictions existed on capital flows, with dividends and capital gains freely remittable, subject to standard withholding and capital gains taxes. Although Bank of Botswana approval was required on large transactions, this was typically just a formality.²⁶ Expatriates could remit 65% of gross earnings out of the country, a limit which has since been raised to 100%. Botswana also boasted one of the most liberal exchange regimes in Africa, backed by a stable and freely

convertible currency. Finally, foreign ownership restrictions were virtually nonexistent with the exception of a few industries deemed sensitive by the Government. There were no requirements of local participation in foreign investments.²⁷

The country's legal system, based on Roman Dutch law, was transparent and effective in enforcing contracts.²⁸ There was a high level of respect for the law and a functioning judiciary ensures that it is strictly enforced and adhered to. More recently, business executives rated Botswana as having the lowest levels of bribery and one of the best reputations for personal security and absence of organized crime in Africa.²⁹ Botswana's corporate tax rate of 35% was highly competitive with its neighbors. For non-mining manufacturers, a reduced tax rate of 25% represented a significant advantage and the lowest tax rate in the region at that time.³⁰

Incentives

The Botswana Government's diversification strategy included two incentive programs to encourage the development of manufacturing and other industries outside of mining and cattle. The first of these, the Financial Assistance Plan (FAP), included tax reductions, labor subsidies, and training and capital grants. The second, the Local Preference Scheme (LPS), provided a benefit to Botswana manufacturers in the bidding process for government tendered projects.

FAP - The relevant part of the FAP for any Owens Corning investment

²⁶ Price Waterhouse, *Doing Business in Botswana*. Price Waterhouse USA P.19.

²⁷ Ibid, P.22.

²⁸ *The African Competitiveness Report 1998*. The World Economic Forum, Geneva. P.219.

²⁹ Ibid, P. 220.

³⁰ It has since been lowered to 15%.

was referred to as Automatic Financial Assistance and consisted of:

- (i) a five-year step-down tax holiday of 100% of taxes in years one and two, 75% of taxes in year three and 50% and 25% tax breaks in the fourth and fifth years respectively;
- (ii) a step-down reimbursement of unskilled labor costs of 80% for the first two years and 60%, 40% and 20% for years three to five respectively; and
- (iii) a five-year 50% reimbursement of “off the job” training costs.

Additional assistance via the FAP was available on a case by case basis, offering a capital grant of up to P1,000 per local job created (depending on job location and a step-down sales augmentation plan up to 8% of sales, reducing to 2% over five years).

LPS - Local manufacturers which qualified for this incentive program would be selected in government contracts even if their prices were higher than foreign manufactured goods. The price advantage for local manufacturers was calculated at 40% of the local content ratio of the Botswana product when tendering for government contracts in competition with foreign firms.³¹

It is important to note, however, that while Owens-Corning was aware of these seemingly attractive incentive programs, they were not emphasized in the 901 study. In fact, all incentive programs were expressly excluded from the feasibility study’s financial projections. In the end,

the team’s recommendation to pursue Botswana relied far more on the country’s general investment climate, which featured political stability and openness to FDI, and satisfied most of the requirements of a pipe manufacturing plant.

Quality of Life

Though somewhat more difficult to define, Owens Corning carefully examined various “quality of life” factors. These included personal security, amenities, accessible rental property, international schools, ease of travel, and receptivity of the local population. Lemar, who had been living in Botswana for several years, was able to provide good insights on all of these issues. At the most fundamental level, the country’s police force was trustworthy and provided good protection for people and property. As a consequence, crime control and personal security were extremely good, especially when compared to other countries in the region. The low level of corruption, already discussed above, lessened many of the hassles during encounters with the public service. Housing, international schools, and general amenities were not as diverse or abundant as in South Africa but they were adequate. Finally, one of the most positive factors, as judged by Owens Corning had to do with the Botswana themselves, particularly their friendliness towards foreigners, honesty, and the fact that most of the population spoke English.

Infrastructure & Utilities

Owens Corning was particularly interested in the physical infrastructure that would, on the one hand, facilitate imports of inputs and exports of the final product to neighboring countries, and on

³¹ This usually equates to a 10% price preference for a company based in Botswana. That is to say, if a South African firm bid \$100 for a contract, the Botswana based firm could theoretically bid up to \$110 and win the contract.

the other, support the manufacturing process. Although landlocked, Botswana hosts the main highway linking the industrial district of South Africa to the rest of the continent, making it ideal for distributing the finished pipe. Imported inputs for the plant would arrive at Durban and be transported by road to Gaborone, a relatively simple process since it is also the main route for most of Botswana's imports.

When the team evaluated the country's utilities their findings were mixed. Botswana's telecommunications system was reliable and modern yet expensive. Since telecommunications costs were a relatively insignificant portion of expenses, reliability was prized over price. This was also the case with electricity. Botswana had limited access to natural power sources, forcing significant dependence on a mix of expensive locally produced power and imports from South Africa. As a result, power charges in Botswana were 2 to 4 times higher than in its neighbors and double average industrial costs in the United States. After conversations with Government officials and the electric utility company, Owens Corning understood that within a few years Botswana would rely more on power imports thereby lowering the price. Nonetheless power rates would still be relatively expensive and subject to price fluctuations beyond the immediate control of the government. This concerned the team. To resolve the matter they carefully analyzed electricity's impact on direct costs. After arriving at an estimate of between 1% and 2% of projected annual costs they decided this would not be a significant impediment. Similar to their research on telecommunications the team was more concerned with reliability than price where the utility was a minor expense.

Access to land tends to be complicated in most African countries and Botswana was no different in this regard.

Although there were no restrictions on foreign ownership of land, only 5% was available for freehold. As a result freehold land rarely changed hands. The other 95% was divided between state owned land (25%) and tribal land (70%). These types of land could be leased annually for periods up to fifty years. The team's main concern, however, did not have to do with outright ownership. Rather, the economic boom of the late 1980s had left a grave shortage of serviced industrial land within Gaborone. This effectively forced the team to look at sites just outside the capital. While the manufacturing facility itself was not large, Owens Corning would need between 40,000m² and 50,000m² to accommodate the accompanying office buildings and store the completed pipe. After enlisting the assistance of the government and a few months of searching they found an adequate site, 20km from the center of the city. Located beside one of the country's main highways it was a suitable compromise between distance from the capital and transport logistics. Since most of the inputs and completed pipe would arrive and depart by truck, proximity to the highway was crucial. Labor would not be readily available in the immediate vicinity of the plant yet because of the highway workers could be easily bused in from Gaborone. Although the team was not impressed with how long it took to find the land, they were content with the final result.

Labor Availability and Skill

Notwithstanding the quality of the education system and the fact that Botswana had one of the highest literacy rates in the region, if any one factor stood in the way of the investment it was labor. Through desk research, conversations with business people operating in the country, and the experience of both Lemar and Ulson, a picture emerged of a

labor force with substantial problems. Foremost were the issues of low productivity, lack of technical expertise, and health.

Finding reliable and comparable national data on labor productivity is notoriously difficult in most developing countries. In the absence of published information, companies have to rely on crude measures such as dividing sectoral output by the number of employees active in that particular sector. The team extrapolated as best they could but the bulk of information and informal statistics came from Lemar and other business people active in the country. Their general impression was that Botswana's labor force was ranked one of the least productive in the region, much lower than its neighbor Zimbabwe and only possibly on a par with South Africa.

The deficit of adequately trained or specialized labor was easier to understand. Moreover, the root of the problem was apparent. Universities and technical colleges were producing lawyers and administrators in vastly greater numbers than engineers or technicians. It appeared that graduating students aspired to government careers more than any other. With the central government employing 25% of the formal workforce, there was clear logic to the student's aspirations. When employment in local government was also considered the number jumped to over 30%. The Owens Corning plant would require skilled technicians and engineers, as well as chemicals expertise to deal with the polymers involved in the manufacturing process. Finding the required talent among a limited number of graduates would be a problem.

Botswana's location and the fact that it hosted the main highway linking South Africa to the rest of the continent was both a blessing and a curse. Owens Corning would be able to utilize the highway system to supply the region with GRP pipe. Yet these distribution routes

have been blamed for one of the largest crises affecting the future of Botswana: the spread of AIDS. With high volumes of commercial trucking and other traffic flowing through Botswana from South Africa, Zimbabwe, and Zambia it is hypothesized that the HIV virus spread rapidly along the main roads and nearby urban centers. Estimates claim 30% of the adult population of reproductive age was HIV positive.

These issues weighed heavily on Gilbu's mind. Would they find enough technical labor? How would low productivity and the AIDS epidemic affect operations? Neither Lemar or Ulson could find easy answers to these questions. There were, however, some notably positive traits of the labor force. Firstly, Botswana was one of the least unionized countries in the region. Few if any unions existed outside the public sector. As a consequence labor disputes were extremely rare. Secondly, labor costs were between one half (electricians) and a fifth (machine operators) of U.S. costs and significantly lower than those of South Africa. Thirdly, the high quality of education at both the primary and secondary levels provided a solid foundation for adding specific skills. In other words, if the labor force could not provide all the requisite skills during start up, Owens Corning believed they could train their incoming staff more easily than in other African countries.

In the end, though some concerns lingered, several key factors combined to overcome the labor force hurdle. Freedom from labor disputes, relatively cost effective wages, and a solid educational foundation on which to build skills have been mentioned above. Other factors included Botswana's flexible policy on the hiring of expatriate staff and the intervention of NORAD, the Norwegian Aid Agency. While Owens Corning could not bring in unskilled foreign laborers to work at their plant the Government

would grant permission to hire some expatriate skilled laborers, particularly if these were being brought for the purposes of training local staff. Moreover, the Ministry of Education was planning to introduce more technical specialties at the university level, while increasing funding for existing technical departments like engineering and chemistry.

During his meetings with the NTC and Norwegian Embassy, Gilbu had also met with officials from NORAD. They talked about the development of the NSC and the aid projects ongoing in the country, some of which involved training schemes. When NORAD agreed to provide a training grant to help workers acquire the specialties the new plant would require, it worked to further allay Owens Corning's labor fears. The reasoning for NORAD intervention was relatively simple. They had been impressed with the returns on other development projects in the country and were committed to helping the Government in its efforts to upgrade the labor force. The Owens Corning investment would provide an excellent opportunity to demonstrate this commitment.

Securing the Partnership

When Owens Corning began to look at Southern Africa as a location for a new plant the company was in the throes of fending off a hostile takeover bid. Debt taken on to counteract the bid had limited Owens Corning's capacity to expand, particularly through a greenfield investment where the company would assume 100% of the commercial and non-commercial risk. This financial crunch and risk-mitigating stance could not have come at a worse time. Owens Corning was ready to capitalize on the R&D of the early 1980's which refined the production process for GRP making it both stronger,

and most importantly, more affordable. The solution to this temporary impediment was to seek out partners for their overseas ventures. Partners would have an important three faceted role in any investment. First, they would reduce the commercial risk to Owens Corning through their financial participation in the venture. Second, in cases where the partner was local to either the country or the region they would provide expertise on the market, facilitate start up and operations with either Government contacts or distribution networks, and provide assistance in marketing to clients possibly unfamiliar to Owens Corning. And finally, local partners would be valuable in helping to win Government contracts like the NSC project.

Botswana presented not only a solid case good for investment on its own merits but also, through the interest of Murray & Roberts, a high probability of success. During their initial meeting at the Norwegian Embassy Gilbu and Lemar noted the mutual interest of their companies. Important to Gilbu, Owens Corning would be able to establish themselves in the region while at the same time benefiting from the experience of one of the most successful construction-related companies South Africa had to offer. Murray & Roberts had an annual turnover of over US\$600 million and operations in South Africa, Zimbabwe, Malawi, Zambia and Botswana. It was well established in large diameter piping, particularly concrete and ductile iron. Its interest in developing GRP pipe proved to be a fortuitous convenience.

As the first contact between Owens Corning and Murray & Roberts, Lemar would be the lynch-pin in the partnership process. From his initial meeting with Gilbu he stressed Murray & Roberts' interest in a joint venture to establish a GRP plant in the region. Prior to meeting with Owens Corning, Lemar had already been exploring possible

ventures with other European firms. Now he would focus exclusively on building a bridge between Murray & Roberts and Owens Corning. Gilbu and Lemar built a good professional rapport. Their discussions were frank and open, giving both companies a good, detailed perspective on the other. As a result, after their initial introduction, neither company searched for other potential partners. While Gilbu would keep Owens Corning management apprised of developments in the investment process Lemar would also report back to Murray & Roberts' directors in South Africa, describing the scope, potential and commitments involved in the joint venture. Between 1989 and 1991 Owens Corning completed the bulk of its initial 901 feasibility study. Based on the favorable results of the study, they had also decided by then that Botswana could adequately host a GRP investment. In early 1991, they entered into more formal negotiations with Murray & Roberts.

However, as Owens Corning began to negotiate the specific details of the partnership it became apparent that Murray & Roberts had abruptly shifted its focus. 1991 was a year of great change in the political landscape of South Africa as it disassembled the apartheid regime that had isolated the country for years. Murray & Roberts saw a tremendous potential within the new South Africa. It was also concerned with the effect the global recession was having on diamond sales, and therefore on the Botswana economy. Emphasizing their new orientation, they sold off their share in the Botswana PVC operation to another South African company and were busy consolidating operations back in South Africa. For now, Murray & Roberts insisted that any joint venture plant would have to be set up in South Africa.

Owens Corning was unconvinced. Rather, management by this point was sufficiently impressed Botswana that they

were willing to forego the important link with Murray & Roberts and seek other options. Developments inside Owens Corning also allowed the team to take a little more risk. 1991 was the same year Glen Hiner took over at the helm of the corporation and set forth a mandate of international expansion and growth. Owens Corning would now have more financial maneuverability.

In an odd twist of fate it was Lemar that further encouraged Owens Corning to see that its future lay in Botswana. Having worked in both South Africa and Botswana Lemar knew that the political changes in South Africa would create opportunities but also that the transition period would be politically tumultuous and could last for several years. It would be a far from ideal environment to establish the region's first GRP facility. With the sale of the majority stake in the PVC plant Lemar would have had to return to South Africa to continue with Murray and Roberts. However, he persuaded Owens Corning that other partners could be found for the venture and that his experience in region would be a valued asset in that search. Lemar resigned from Murray and Roberts and was hired as a consultant to Owens Corning, setting the stage for the most important and final step of the site selection process. He would not only work to redraft the 901 study, update it and take into account the change in plans, but would also head the search for new partners.

Instead of seeking another large industrial partner, Owens Corning first explored the local options available inside Botswana. Owens Corning did have more financing available in 1991 and could have supported a greenfield investment yet they did not feel secure entering this new market alone. Moreover, they still sought local partners for the advantages they presented both operationally and in

assisting Owens Corning to win supply contracts for regional pipe projects.

Gilbu and Lemar had already made contact with the first and most obvious candidate several years before, the Botswana Development Corporation (BDC). A representative of the BDC had been present at the Norwegian Embassy for their initial meeting.

Established in 1970, the BDC was the country's main agency for commercial and industrial development. The corporation provides investment loans, guarantees, share capital, industrial plots and factory premises to both local and foreign investors³². Financed by the government, which owns all of BDC's ordinary shares, it serves as one of the main vehicles for industrial diversification yet is still expected to make a profit. The goal of the agency is to foster national development and diversification through investments in the private sector supporting both local and foreign investors. In many ways it is a local version of the World Bank Group's International Finance Corporation. In the five years leading up to the Owens Corning investment, the BDC had averaged a return on capital of over 15% with total investments of BWP 283 million.

Interested in the Owens Corning proposition, the BDC undertook its own due diligence, which included a trip to Norway to inspect the GRP production process and the final product. They reviewed the financial projections of the feasibility study and examined the market for GRP in the region. Impressed with the potential of the project, the two BDC investment officers assigned to the project, Ms. Kgosietsile and Mr. Madikwe, prepared report recommending that the BDC take a 33% interest in the operation.

The report was presented to the board in mid-1992 and approved.

OC wanted a local majority stake in the venture, which would be crucial if the company wished to bid for projects such as the NSC. The team now had to seek out more partners to complete the additional 18% equity position if Owens Corning was to hold 49%.

And thus Lemar began negotiations with Mr. Lawrence Lekalake, one of the top businessmen in the country and an analytical chemist by training. Lemar knew Lekalake from his years as manager of the Murray & Roberts' PVC plant. The business community in Botswana was relatively small and Lemar's status as representative of Murray & Roberts brought him into contact with a number of prominent business people. Coincidentally, Gilbu had also met Lekalake during his first trip to Botswana. He was another invitee of the Norwegian Embassy.

After being appraised of the opportunity Lekalake gathered together a group of local individuals interested in an equity position in the venture. The group, which included prominent figures from the local business and political community, formed a partnership called Motswedi, the setswana word for water. They raised the required funds to finance their 18% stake and thereby cemented the partnership that had been derailed by Murray & Robert's departure.

In the end, though Owens Corning lost the power of a major regional player like Murray & Roberts, both the BDC and Motswedi proved vital to the setup and success of the future plant. Lekalake met with Lemar on a weekly basis to discuss progress and provide advice on permitting and set up. To the same end, he used his contacts to arrange meetings with politicians and other public officials. The BDC proved to be an effective advocate directly connected to the government. They both

³² Botswana Development Corporation, 25th Anniversary Review of the Corporation. Page 4.

assisted the company in cutting through the bureaucratic procedures as efficiently as possible.

With the partnership finalized, a coherent picture of the financing emerged. The partnership was structured with Owens Corning holding the largest share of the equity (49%) through its Norwegian subsidiary VERO. This corporate vehicle is the principle licensor of the GRP pipe technology and was chosen so that the partnership could qualify for a US\$2.4 million loan from NORAD. The NORAD loan was yet another way in which the Norwegian aid agency furthered its developmental role through the project and Owens Corning benefited because of Gilbu's Norwegian contacts. This loan

would be used to pay for GRP manufacturing equipment. The remaining equity positions, as noted above, were held by the BDC (33%) and the Motswedi Group (18%) giving a majority of local ownership.

With the signing of the partnership agreement, the recommendation to invest was sent to Owens-Corning's Board and CEO. Just before Christmas 1992, after a short deliberation, management gave its approval and the investment was made public. It was the first GRP pipe plant in the region, the first investment by a large, high profile U.S. multinational in Botswana, and a symbol of the Government's efforts to diversify Botswana's economy.

Weighing the Factors: Owens Corning Pipe Botswana

During their investigation, the Owens Corning team uncovered a wealth of information on the business climate in Botswana and the operating environment for their plant. They were impressed by the political stability and its freedom from corruption but were deeply concerned at the same time with the condition of the labor market, the availability of land and the cost of utilities. What propelled them, then, to go ahead with the investment?

Briefly there were three main answers: i). the government and business environment was stable and uncorrupt, ii). there was a basic and strategic fit between the investment and what the country had to offer, and iii). the intervention of third parties provided the information and resources to satisfy Owens Corning's needs.

Stability and the Business Environment

Although Botswana was not competing against other locations for this investment, Owens Corning's past experience in Africa created a corporate frame of mind the was looking for an excuse not to invest. To take the first step towards securing the investment Botswana would have to battle hard against the legacy of Nigeria. As it turns out it was a victory Botswana had won well before Owens Corning first ventured to Africa in the early 1980s.

Since independence in 1966, the country's leaders had worked together to create a stable political environment. Particularly after the discovery of diamonds, there were competing ideals of how the country should develop and move forward. Yet throughout the 1970s and 1980s, and up to the time Owens

Corning began to consider Botswana for its investment, there was a tremendous respect for democracy within the country. Although the ethnic homogeneity of the country made the democratic process easier to manage, Botswana faced its share of complex and potentially destabilizing issues, including civil wars in regional neighbors and a precarious balance during the apartheid years.

Yet the stability of any country, and therefore its business climate, is contingent to a large degree on the political system that supports it. A long history of achievements would be worthless if political unrest was left festering with the potential to explode at any moment. This did not prove to be the case in Botswana. Notwithstanding the dominance of the Botswana Democratic Party, the potential for political upheaval was almost non-existent. The political process was extremely inclusive. All parties were given the chance to contribute before any weighty decisions were made. This severely limited the potential for breakdowns in the political process. Although this often produced delays in policy formulation, Owens Corning was happy to accept the compromise.

Control over corruption was a particularly endearing trait in the eyes of Owens Corning. The case involving the head of the housing authority provided an illustration not only of the government's quick reaction but also the public's opinion of corruption. The latter insight was refreshing to Owens Corning's management. In many developing countries, and even some classified as developed, corruption has become an accepted part of business; just another operating expense. U.S. and some European companies can no longer

simply dismiss the issue, however, as they may be liable in their home countries under anti-corruption legislation. In fact, the vast majority of multinational companies view corruption as a major impediment to investment if only because of the uncertainty it brings to the management of their operations.

The use of government and diamond revenues to finance infrastructure, education and systemic improvements demonstrated an acute foresight and commitment to investment often lost to competing political agendas in other developing countries. Like the examples cited in the previous section, the transformation of Botswana's road network and education system stood as a testimony to the Government's hard work. The country inherited only 20km of paved roads and 22 university graduates from the British at the time of their independence. By 1991, there were 2,664km of paved roadways and 3,100 university graduates.

Most importantly, the stability of the political system and soundness of the business environment provided a clear arena for Owens Corning's investment. Financial projections, which under the 901 requirements had to cover at least the first 10 years of operations, were made with relative certainty. To approve an investment or secure financing from third parties, any company must be able to define the costs, the amount of time it will take to recover those costs and the scale and duration of future profitability. When factors like corruption, inefficient public services, or political insecurity are present to a degree that will affect operations, the company can no longer safely trust basic financial projections. Instead, assumptions have to be made about the impact of each negative factor. This requires more complicated financial models. At some point, because selecting an investment location is as much a human process as a financial one, the site selection team may

be unwilling or unable to develop complicated models to deal with these uncertainties. If the team can find a location that offers similar benefits even though it might be marginally more expensive it will most likely choose the more stable site. No matter how cheap or skilled the labor pool, how large or beneficial the investment incentives, the stability of the investment environment is almost always an investor's primary concern. This was true for Intel Corporation when they were making their decision to invest in Costa Rica and was true for Owens Corning when they choose to go to Botswana. Owens Corning's unwillingness to follow Murray & Roberts to South Africa adds credence to this point. The site selection team determined that personal security, political stability, and the lack of labor disputes were just some of the factors that wedded them to Botswana.

While past performance is never a guarantee of future results, Owens Corning was not aware of any factors indicating that this pattern was about to change. The Government's customary manner of leading the country instilled confidence in the investor and dispelled the lingering doubts from their experience in Nigeria.

Strategic Fit of the Investment

Owens Corning became interested in the Southern African region because it offered not only a specific business opportunity but also the chance to expand operations into unexplored markets. As an integral part of business, Owens Corning kept a constant eye on emerging markets for opportunities to license production, invest, or engage in joint ventures. The rising demand for large diameter pipe was the trigger that produced an initial trip by the site selection manager, Mr. Agnar Gilbu, and encouraged further

investigation. Before his trip he felt any country within the region could have competed to host the investment.

Ultimately there was a fit between Owens Corning's objectives and the environment and services Botswana offered as a host. Outside South Africa, Botswana had the largest demand for pipe. The crystallizing factor for Owens Corning was the North South Carrier Project. Botswana had demonstrated a credible system to finance a project of this size and there was a preference for local producers. By locating in Botswana Owens Corning could place a competitive bid on the NSC and also reach export markets through Botswana's trading relationships and central geographic position. Yet Owens Corning could not forget its mistake with Nigeria. An investment in Botswana would have to present considerable advantages over supplying the region with exports from Europe. Therefore demand and a tangible project, though significant, were only part of the reason for Botswana's success.

There would have to be a fit between the needs and sophistication of the production process and the country's general level of development also. This proved to be the most challenging hurdle for the investment. Labor, land and utilities did not measure up to Owens Corning's expectations. Yet the investment went ahead. In their final analysis the team made two important conclusions. Firstly, although the issues, particularly labor, were significantly unfavorable, they were not unredeemable when placed in context. For instance, while the country was not a natural host to abundant skilled labor, the excellent primary and secondary education system would provide an adequate foundation on which specialized training could be based. Moreover, these schemes would be assisted by both the Government and NORAD.

Secondly, when these problems were placed within the broader context of the overall investment climate they were outweighed by the positive factors Botswana *could* offer as a host. In other words, the team determined that the project easily fit with the country's general level of development. The plant would not require any infrastructure spending or government commitments to subsidize utilities. Raw materials would be imported in the same way that most of the country's other imports arrive. Utility costs, although expensive, were not so high as to deter the investment and only comprised a small proportion of direct costs. Distribution would use the existing highway network, which was more than adequate. The size of the investment was not so large that it would place an undue burden on the labor market. Yet, it was large enough that to make a considerable contribution to a formal workforce that only totaled 220,000 in 1991. The legal system was reliable and just. The economy was well regulated and open and few restrictions existed on repatriation of capital

Roles of other Parties in the Investment Decision

The call from the NTC inviting Gilbu to Botswana brings an interesting and surprising element of chance to this investment. Although Botswana did not have an effective investment promotion agency at the time³³ it was host to a number of groups and individuals that were willing and able to fill that gap.

The initial surrogates for the investment promotion agency were the NTC, NORAD, and the Norwegian Embassy. With its contacts in the region and attention to business opportunities

³³ TIPPA, the Trade and Investment Agency was active in the early 1990s however it was not particularly effective at investment promotion.

for Norwegian companies, the NTC was the first to contact Owens Corning directly. Prior to this, Owens Corning had been looking at possible ventures in Southern Africa but had not planned any trips to the region for further investigation. Two of the NTC's regional contacts were the NORAD representative in Botswana and the Norwegian Embassy in Gaborone. Both had noticed the potential business in large diameter piping that would arise in the region. At the urging of the NTC the Embassy hosted a function and invited representatives from several companies to attend. This event became the staging catalyst for the investment.

The Norwegian involvement did not end there, however. After Owens Corning had settled on Botswana, NORAD provided a loan to pay for capital equipment and machinery and offered a training grant to increase the technical skills of the incoming workforce. It is not unusual for development agencies to offer these types of loans and assistance. What is important, however, is why they were willing to offer them to Owens Corning's investment in Botswana.

In this case, the logic was quite simple. The Norwegians had a number of aid projects throughout the region. Over time they noticed that kroner for kroner they were achieving a higher impact in Botswana than elsewhere. Aid sent to Botswana was not being squandered but produced tangible results and success stories that could be demonstrated to NORAD's management. At the same time, the Government was grateful for the assistance and helped the Norwegian projects in any way it could. The Norwegians were impressed by this, the government's level of organization, and their fiscal prudence. When it came time to support the Government's commitment to diversification and their investment promotion efforts, NORAD

was willing to assist in any way possible to further this development goal. Owens Corning's Norwegian subsidiary, VERO, qualified the company for NORAD assistance and Gilbu, a Norwegian citizen, helped cement the deal.

Another central catalyst was Lemar who was able to provide information on all aspects of the business climate in Botswana and, to a certain extent, in the rest of the region. Essentially Lemar acted not only as a substitute for the promotion agency but as an independent means to corroborate facts Owens Corning had gathered on their own and from the NTC.

Lemar also had access to members of government by virtue of the fact he represented a respected foreign investor in the country. The Government realized the importance of maintaining a good relationship with their foreign investors and saw them and Lemar as some of their most effective advocates in attracting other investors. During the interviews that formed the backbone of this paper, the Minister of Industry and Commerce, Honorable Keledi George Kgoroba, confided that he would like to bring Mr. Lemar on each of his overseas missions to demonstrate Botswana's ability to host successful manufacturing operations.

Yet Lemar's impact on the investment decision process was much deeper than simply answering Owens Corning's queries. Lemar was the bridge between the two potential partners. When Murray & Roberts wanted to divert the venture to South Africa, Lemar provided impartial counsel to Owens Corning and found new local partners. Lemar had this power because he had full confidence in the business environment in Botswana. His confidence was derived from actual experience. Both Botswana and Lemar benefited from this commercial symbiosis; Owens Corning invested in the country and Lemar became general manager of the new plant.

This confidence and relationship between Lemar and Botswana provided important guidance to Owens Corning. Lemar had enough faith in Botswana as the correct location for the plant that he was willing to sacrifice his career with Murray & Roberts and take a significant risk by becoming a consultant to the Owens Corning selection team. The significance of this extreme vote of confidence for Botswana was not lost on Gilbu and management within Owens Corning.

Even the role of the local partners, the BDC and the Motswedi Group, provided a vote of confidence for Botswana in the minds of Owens Corning executives. Well aware of the difficulty of finding reliable local partners in developing countries, Owens Corning was both intrigued by the ease with which they found their partners and their quality. The real value of the BDC and Motswedi was their advice and assistance as local advocates, however. They provided Owens Corning with crucial input on how to manage permitting procedures and other setup requirements. They arranged meetings with relevant leaders and took on a number of issues with the Government themselves. Even Lekalake's background as an analytical chemist proved fortuitous and useful. Through it

he was able to understand Owens Corning's labor requirements and work with the company to identify possible solutions.

For reasons of risk mitigation and a need for local expertise Owens Corning decided from the start that the investment would require one or more joint venture partners. Botswana was able to deliver two excellent options. In Gilbu's mind what did not happen in the selection of local partners should stand as an example for other countries. Owens Corning was *not* required to have local partners. The partners they did choose were *not* hoisted upon them by the Government or powerful industrial groups within the country. Finally, the partners did *not* place unreasonable demands on Owens Corning *nor* did they overvalue their own role in the partnership.

To say that the activities of the NTC, Lemar, and the local partners were initiated by chance is probably unfair to Botswana and understates the importance of these groups to the investment process. Instead, their roles, particularly the NTC's and Lemar's, were more a function of serendipity than chance. The Norwegians and Lemar did not pick Botswana by chance; they chose it because they knew it was a good bet for both development and commercial success.

Appendix 1: Definition & Explanation of Plastics, Composites and GRP

Plastics

Plastics are synthetic materials made from chemical materials called monomers. For example, a monomer such as ethylene is reacted with other monomer molecules into long chains of repeating ethylene units, forming the polymer polyethylene. Plastics begin as gas, approach a liquid state for forming, and end up as a solid in their finished form. These materials can be formed by heat, pressure, or a combination thereof. Adding reinforcements to plastics creates a different class of materials known as composites. Greater understanding of the fundamental chemistry of polymer formation has led to development of plastics with properties tailored to specific applications. Rather than refining materials found in nature, chemists can now design materials with the same elements nature uses. In fact, polymer chemists have built thousands of plastics based on eight elements – carbon, hydrogen, nitrogen, oxygen, fluorine, silicon, sulfur, and chlorine.³⁴

Composites

Composites are fabricated material systems made of two or more components (plastic resin and glass fiber, for example).³⁵ The concept of composites is not really new. The Egyptians reinforced mud with straws to make bricks. In the 1940s, fiberglass became the first composite with a plastic matrix. Developments in composite technology since then have given designers the choice of a broad range of materials, each of which can be tailored to meet specific requirements. This, however, also means a larger and more complicated materials menu and more challenging selection process.³⁶

Worldwide, the composites industry has relatively few suppliers of raw-material components. These companies deliver to thousands of customers through various channels. Depending on the application, raw materials move through different manufacturing process chains, ultimately finding their way to consumers and original equipment manufacturing (OEM) customers in a number of worldwide markets. The three major global producers in the glass fiber industry (Owens Corning, St. Gobain/Certain Teed and PPG) have developed significant technology, established sophisticated and widespread channels of distribution, and have made substantial investments in assets.³⁷

The global fiber industry for composites is currently about \$4.3 billion, and about 2.3 million cubic tons in size.³⁸ Many observers view development of civil engineering applications as one way to overcome limitations on growth and profitability imposed by the mature, cyclical business that account for most composite markets. The market had initially been nurtured by the defense and aerospace industries.³⁹ Composite enthusiasts see a particularly bright future for advance materials in infrastructure construction – some

³⁴ “Plastics”, *Machine Design*, June 1994, page 587.

³⁵ Op. Cit., Owens Corning 1997 Fact Book, page 42.

³⁶ “Basics of Design Engineering – Composites”, *Machine Design*, 9 February 1995, page 98.

³⁷ Op. Cit., Owens Corning 1997 Fact Book, page 42.

³⁸ Ibid., page 42.

³⁹ “Composite Industry Eyes Civil Engineering as Next Big Market” *Modern Plastics*, April 1994, p. 18.

estimates indicate that the cost of replacing obsolescing infrastructure in the U.S. alone will be about \$3 trillion.⁴⁰

The most critical issue relating to the widespread use of composite materials in the construction industry is that a framework is needed that will allow architects and structural engineers to specify composite materials for civil engineering structures in a similar way to how they now specify conventional materials.⁴¹ Complicating the issue, there is no long run performance data on how composite materials hold up in various applications over time. Industry leaders concede that they need to develop structural data on composites that engineers can use as a reference for their projects. Education, in the interim, remains a major challenge – it's the primary driver that allows any new material to come into general usage, and entrepreneurs, engineers and others are not going to design anything using materials they aren't familiar with. Universities, although willing to offer undergraduate courses in composites, often have difficulty finding faculty – because no pool of expertise exists.⁴² This has resulted in very few engineers who understand composites, much less have the comfort and expertise to use them in their design specifications.

Glass Reinforced Plastics

There are two principal types of composites, thermoplastic and thermoset. Thermoset matrix systems dominate the composites industry because of their reactive nature and ease of impregnation. Thermoplastics, although more expensive, offer performance gains which more than compensate for their increased cost. How a particular property is affected by reinforcement depends to a large degree on the type of fiber used. The three main types of fibers used to reinforce thermoplastics are glass, carbon and aramid. Practically all thermoplastic resins are available in glass-reinforced compounds. Molded products usually contain between 5% and 60% glass by weight, with the best performance ratios around 20% to 40% glass. Glass fiber reinforcement improves most mechanical properties by a factor of two or more. Also improved are dimensional stability, hydrolytic stability and fatigue endurance.⁴³

After the Denver based American Water Works Association adopted a standard for GRP pipe in 1981, AWWA C-950, the product slowly started to gain a toehold. A track record evolved from successful placement on projects in Iran, Spain and Argentina.⁴⁴

⁴⁰ "Education: The Biggest Challenge for Advanced Composites Sector", *Modern Plastics*, June 1994, page 180.

⁴¹ "Questioning Composites", *Civil Engineering*, January 1993, page 64.

⁴² "Education: The Biggest Challenge for Advanced Composites Sector", *Modern Plastics*, June 1994, page 180.

⁴³ "Basics of Design Engineering - Composites", *Machine Design*, 9 February 1995, page 99.

⁴⁴ "Dry Africa Seeks Water Resources", *Engineering News Record*, 22 September 1997, page 10.