##  Northern Virginia Community College

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| Assignment for Course: | Finance 215 – Financial Management |
| Submitted to: | Mark DAntonio |
| Submitted by: | (Name of Group goes here) |
| Date of Submission | MM/DD/YYYY |
| Title of Assignment | FIN 215 Case Study (Updated 15 May 2011) |

**Instructions:** Read the questions very carefully because the requirements for each are specific. Each group should turn in one copy of this WORD document (email to me) with the names of the participating group members typed on the bottom of this cover page. Answer all questions fully on this document only. That is, I want to see the question below followed by your answer so I do not have to guess what you are answering. This project is worth 100 points.

CERTIFICATION OF AUTHORSHIP: I certify that the group named above equally contributed to the assignment that is attached. Any assistance received in its preparation is fully acknowledged and disclosed in the paper. Any sources from which the group used data, ideas or words, either quoted directly or paraphrased is also disclosed. Please print and sign below.

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**IS GLOBAL WARMING AN Opportunity or trap?**

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**Abstract**

Students will get an understanding of how the uncertainty of the business environment changes decisions and leads to Capital Budgeting decisions. The Case tracks the story of Gulf Electric Inc., a mid-sized electrical manufacturing firm, producing parts for utility firms and electrical products for retailers. Hurricane Katrina caused a paradigm shift for individuals and businesses. Many Post-Katrina firms were devastated but some found a golden opportunity. The case deals with how Gulf Electric might handle the business environment they encountered after the storm. It deals with how Gulf Inc. dealt with a capital budgeting project to ramp up production of home generators, pumps and other equipment.

**KEYWORDS:** Capital Budgeting, Net Present Value, Sunk Costs, Sensitivity analysis, Breakeven point, Global Warming, Katrina, Business Strategy

## ETHICAL AND CORPORATE LOYALTY CONSIDERATIONS: Case Study Scenario CASE OBJECTIVES

The purpose of this case is to construct a model of the decision process in a firm and how opportunities can be exploited. The case presents an analysis of cash flows and a sensitivity analysis of alternatives. Basically the case is very relevant because manufacturers today often face build or buy choices.

The teaching objectives are:

* The evaluation of opportunity in the business environment
* The calculation of the breakeven point
* The calculation of a sensitivity analysis
* The effects of the green movement and global warming on consumer sentiment
* The multidimensional decision making process involved in capital budgeting
* The use of Net present value as a tool to evaluate projects

## The case can be used for Accounting, Strategy and Finance applications. Case questions are divided into different groups following the case with multiple uses in mind.

## CASE FRAMEWORK

Following Katrina, the devastating storm on the Gulf coast of the United States in 2001, many firms were caught unprepared. This case highlights how organizations may benefit from analysis and planning. The case introduces and discusses the dilemma that a firm faces when demand is unpredictable.

## THE SCENARIO

Gulf Electric Inc. (GEI) is an established mid-sized electrical manufacturing firm that supplies electric utility products, parts and equipment in the southeastern United States. GEI’s business had been stagnant in the last five years due to good weather and recent competition in the industry. The firm had traditionally supplied electric utilities in the southeast with all types of electrical equipment through long-term contracts. Thus the demand and the revenue stream were steady over a number of decades. The electric companies had performed maintenance and upgraded lines on a steady and predictable basis. In recent years foreign firms had taken steadily taken market share from GEI due to lower raw material and labor costs. GEI found itself in a position where it was losing its traditional market and had little ability to fight back. As a result GEI leadership met to discuss a number of proposals that looked promising. In order to smooth their revenue stream and diversify their business GEI expanded into the higher margin business of consumer products.

## PRODUCT DIVERSIFICATION

Due to the ingenuity of its research and development team GEI had a few patents that gave it a core advantage over the foreign competition. The patented technology allowed GEI to build a line of gasoline and diesel powered electrical generators with smooth power flow. Marcia Gonzalez, the Vice president of Marketing at GEI promoted these items as being safer for consumer products. She labeled the full line GEI products as “PowrFlo” to point out the smooth transfer and flow of power. GEI was able to offer a guarantee that “PowrFlo” products would not damage accessories that were plugged in. Marcia advertised the “PowrFlo” line as being vastly superior for this reason. Since these products virtually eliminated electrical spikes and they were patent protected GEI was able to overcome the cost advantages of the foreign competitors. GEI also had the advantage of being first to market with these newer products that were really in a class by themselves compared to earlier generators. The generators were introduced in 2004 and they were an instant hit taking much of existing competition by surprise. The result was a steady sales increase in 2004 and 2005. Even the power companies bought them as a backup for emergencies. GEI had intended the product line for consumers and they also offered a service plan for only $100 annually that included a GEI technician testing the unit semiannually and replacing the fuel filter and adding fuel stabilizer annually. The sales contract was very popular and provided peace of mind to consumers. Over 80% of new generators were sold with the sales contract. Demand was increasing about 10% per year on a steady basis. GEI marketing research revealed that 2% of customers were replacing older generation equipment while 8% were customers that had never owned a generator before.

GEI also designed special pumps to operate alone or with GEI generators. Like the generators these pumps were made in many sizes and came in 110 volt and 220 volt versions. To make them more flexible they were designed to run on direct current from batteries as well as alternating current.

### GEI THE GREEN COMPANY

GEI also created the option of running the pumps on batteries charged by solar cells mounted on rooftops. The entire line of green products was called “SunnyFlo” and they were promoted heavily by GEI as an alternative to traditional operation. They were practical due to the lack of electricity in some areas such as places were generators could not be placed for safety reasons. They also appealed to the public because of their environmentally friendliness.

An additional feature of the GEI generators was the low emissions that they produced. All GEI generators came with a small catalytic converter integrated into the exhaust system of the generator. The GEI patented technology was capable of emission reductions of 90% over conventional and competing generator models. Because these generators were designed with a patented cylinder head design GEI’s competitors could not easily duplicate their environmental performance. These generators were also marketed with the environmentally friendly “SunnyFlo” label.

### HURRICANE KATRINA

In August of 2005 one of the strongest hurricanes on record struck the gulf coast of the south east United States. Hurricane Katrina caused more than 1800 deaths and caused over 80 billion dollars in property damage. All of the areas hit by the storm lost all electrical power as well as many locations nearby that were not hit by the storm.

**DEMAND GOES WILD**

After the storm the entire Southeastern United States was in a panic. The news showed many pictures of the devastation along coastlines and the wrecked homes and businesses. Most reports focused on the damage in New Orleans and showed how the dramatic failure of the levy system led to widespread misery. Almost immediately, after the storm, demand for GEI generators exploded.

First there was great demand for generators in the storm areas. However, after a few days of incredible television coverage orders began to come in from areas in the Gulf and Atlantic regions in the Southeastern United States in record numbers. It seemed that word of the product had been well received and that Katrina had served as a lightning rod for consumers. Paradoxically, the storm that had caused so much misery and destruction for individuals and businesses, was a tremendous opportunity for GEI. The question was if the company could move quickly enough and in the right direction tactically and strategically to capitalize on the opportunity.

**THE MEETING**

Doug Smith, CEO of Gulf Electric immediately called a senior staff meeting. Doug was looking for solutions and he needed some quick answers. Obviously GEI had to come up with some additional capacity to meet what seemed to be rapid and permanent demand. This was a problem GEI had before Katrina due to the success of the “PowrFlo” and “SunyFlo” products. However, Katrina had given the entire product line a new measure of urgency. The senior staff meeting that the CEO called included the Vice president of Marketing Marcia Gonzalez, the Vice president of Human Resources Amy Johnson, the CFO Alan Wills and the COO Frank Criss with his Chief Engineer John Amer.

CEO

Doug Smith

CFO

Alan Wills

VP Human Resources

Amy Johnson

COO

Frank Criss

VP Marketing Marcia Gonzalez

Chief Engineer

John Amer

Doug summarized the issue at hand regarding product capacity. Marcia had been proclaiming that the demand for the various product lines was a permanent trend. In past meetings Alan had resisted many of Marcia’s ideas in favor of large capital budgeting efforts arguing for outsourcing instead. Amy Johnson, who was familiar with costs of recruiting, training and maintaining a work force supported Alan. Amy feared that changes in demand might cause GEI to have too many employees that it could not easily shed in the event of downward demand shifts. This point seemed moot under the current circumstances. It was clear that Katrina was a paradigm shift from business as usual. Alan and Amy conceded the need for additional capacity and new thinking on the subject.

Now that all parties seemed ready to discuss the capacity issue Doug asked what process to follow. Alan was still worried about funding and the risk of a large expansion and asked Doug to move cautiously. Doug decided to engage in a Break-even sensitivity analysis before proceeding with any large capital budgeting projections. This seemed to ease the tension for Alan and Amy and so Doug asked Marcia to project demand for one product. The best selling generator (the PowrFlo 500) was chosen to use as a model for the sensitivity analysis. Frank and John would come up with cost estimates for production under several scenarios. Amy would investigate the implications of staffing and Alan would compile the information and present it at the staff meeting next week.

**THE SENSITIVITY ANALYSIS**

Doug Smith reported to the main GEI conference room for the next weeks meeting. He was happy to see everyone already there. Alan provided Doug with a list of options that had been discussed during the week. There were three options discussed and they are shown in Figure 1.

|  |
| --- |
| **Breakeven Sensitivity analysis for the PowrFlo 500** |
| **Option** | **Fixed cost** | **Variable cost (per unit)** |
| **#1 – Completely new modern factory**  | **$4,000,000.00** | **$55.00** |
| **#2 - Outsource production** | **$ 0.00** | **$255.00** |
| **#3 - Expansion of the existing GEI facility** | **$1,250,000.00** | **$155.00** |

Figure 1. Analysis of manufacturing options

###  Although the cost of the new facility was staggering and both Alan and Doug were concerned about it they realized that with enough demand for the product the new factory would be the way to go. Doug looked at the breakeven charts that Allan had provided and he could clearly see the sales numbers that were needed to justify the new facility. The only question now was if such demand could materialize to justify the expense.

### MARCIA’S REPORT ON DEMAND, SOCIAL RESPONSIBILITY AND COMPETITIVE ADVANTAGE

Marcia Gonzales then spoke to the group. She made the case that the GEI strategy of emphasizing smooth power flow with the “PowrFlo” technology and environmental responsibility with the “SunnyFlo” technology has led to a competitive advantage for GEI. Marcia further stated that the recent public outrage over the State, Local and Federal government responses to the storm may also be important to the firm. Marcia, stated that GEI made products that were uniquely important to this disaster. While most individuals and businesses were suffering as a result of the storm GEI had benefited. The government was scrambling for a manner to appease the public and act on behalf of its’ constituencies. She made the point that the government should give businesses and homeowner tax breaks to install power generation equipment. Several local politicians in the Southeastern United States had already made noise about such legislation. The fact that the GEI equipment was so environmentally friendly would give a tremendous competitive advantage to the firm. In addition GEI could donate some equipment to certain impoverished areas and to Churches, VFWs and the like. This was a socially responsible policy and it would also contribute to the good name of the firm and it would get GEI’s products out in the public eye.

Marcia then showed the projected demand figure that she had compiled based on her new sales forecasting software, focus groups and consumer polling. The new monthly numbers were no less than stunning. The old sales estimate showed a 1% monthly increase in the estimated sales. The post-Katrina numbers were much higher and increasing at 2%. Refer to Figure 2.

|  |  |  |
| --- | --- | --- |
|   | Old Sales Estimate | New Sales Estimate |
| Date | for PowrFlo 500 (units) | for PowrFlo 500 (units) |
|   |   |   |
| Oct-05 | 350 | 2700 |
| Nov-05 | 354 | 2754 |
| Dec-05 | 357 | 2809 |
| Jan-06 | 361 | 2865 |
| Feb-06 | 364 | 2923 |
| Mar-06 | 368 | 2981 |
| Apr-06 | 372 | 3041 |
| May-06 | 375 | 3101 |
| Jun-06 | 379 | 3163 |
| Jul-06 | 383 | 3227 |
| Aug-06 | 387 | 3291 |
| Sep-06 | 390 | 3357 |
| Oct-06 | 394 | 3424 |
| Nov-06 | 398 | 3493 |
| Dec-06 | 402 | 3563 |
| Jan-07 | 406 | 3634 |
| Feb-07 | 410 | 3707 |
| Mar-07 | 415 | 3781 |
| Apr-07 | 419 | 3856 |
| May-07 | 423 | 3933 |
| Jun-07 | 427 | 4012 |
| Jul-07 | 431 | 4092 |
| Aug-07 | 436 | 4174 |
| Sep-07 | 440 | 4258 |
| Oct-07 | 444 | 4343 |
| Nov-07 | 449 | 4430 |
| Dec-07 | 453 | 4518 |
| Jan-08 | 458 | 4609 |
| Feb-08 | 462 | 4701 |
| Mar-08 | 467 | 4795 |
| Apr-08 | 472 | 4891 |
| May-08 | 476 | 4988 |
| Jun-08 | 481 | 5088 |
| Jul-08 | 486 | 5190 |
| Aug-08 | 491 | 5294 |
| Sep-08 | 496 | 5400 |
| Oct-08 | 501 | 5508 |
| Nov-08 | 506 | 5618 |
| Dec-08 | 511 | 5730 |

 Figure 2. GEI Pro Forma marketing sales projection estimates before and after Katrina

 Marcia’s projections for demand had outstripped all expectations for all products. The breakeven sensitivity analysis provided by Alan showed production numbers for the three options discussed that were easily eclipsed by Marcia’s projections.

### DOUG’s CALL

 Marcia’s numbers really showed the team that new options needed to be considered with more aggressive production goals. Doug realized that expansion of the current facilities just would not do. Doug reasoned that this was a classic make or build situation. Doug thanked everyone in the meeting as they left the conference room. Doug stopped Alan for a moment and asked Alan how GEI could finance such a large project. Alan said he would think about it.

### CASH FLOW

 Alan evaluated the sales figures prepared by Marcia and the marketing staff. He then used the sales price of the PowrFlo 500 to develop a statement of Pro Forma cash flows. Many folks would get very excited by the large gross margin that was apparent in the figures. However, being the CFO, Alan knew he had to calculate a present value (PV) of these future cash flows in order to get a number that could be used by Doug and the rest of senior management to make such a large capital budgeting decision. Specifically Alan would have to discount the monthly cash flows shown in Figure 3.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|   | Old Sales Estimate | Cash Flow with average | New Sales Estimate | Cash Flow with average |
| Date | for PowrFlo 500 (units) | sales price of $499.00 | for PowrFlo 500 (units) | sales price of $499.00 |
|   |   |   |   |   |
| Oct-05 | 350 | $174,650.00 | 2700 | $1,347,300.00 |
| Nov-05 | 354 | $176,396.50 | 2754 | $1,374,246.00 |
| Dec-05 | 357 | $178,160.47 | 2809 | $1,401,730.92 |
| Jan-06 | 361 | $179,942.07 | 2865 | $1,429,765.54 |
| Feb-06 | 364 | $181,741.49 | 2923 | $1,458,360.85 |
| Mar-06 | 368 | $183,558.91 | 2981 | $1,487,528.07 |
| Apr-06 | 372 | $185,394.49 | 3041 | $1,517,278.63 |
| May-06 | 375 | $187,248.44 | 3101 | $1,547,624.20 |
| Jun-06 | 379 | $189,120.92 | 3163 | $1,578,576.68 |
| Jul-06 | 383 | $191,012.13 | 3227 | $1,610,148.22 |
| Aug-06 | 387 | $192,922.25 | 3291 | $1,642,351.18 |
| Sep-06 | 390 | $194,851.48 | 3357 | $1,675,198.21 |
| Oct-06 | 394 | $196,799.99 | 3424 | $1,708,702.17 |
| Nov-06 | 398 | $198,767.99 | 3493 | $1,742,876.21 |
| Dec-06 | 402 | $200,755.67 | 3563 | $1,777,733.74 |
| Jan-07 | 406 | $202,763.23 | 3634 | $1,813,288.41 |
| Feb-07 | 410 | $204,790.86 | 3707 | $1,849,554.18 |
| Mar-07 | 415 | $206,838.77 | 3781 | $1,886,545.26 |
| Apr-07 | 419 | $208,907.16 | 3856 | $1,924,276.17 |
| May-07 | 423 | $210,996.23 | 3933 | $1,962,761.69 |
| Jun-07 | 427 | $213,106.19 | 4012 | $2,002,016.93 |
| Jul-07 | 431 | $215,237.25 | 4092 | $2,042,057.27 |
| Aug-07 | 436 | $217,389.62 | 4174 | $2,082,898.41 |
| Sep-07 | 440 | $219,563.52 | 4258 | $2,124,556.38 |
| Oct-07 | 444 | $221,759.16 | 4343 | $2,167,047.51 |
| Nov-07 | 449 | $223,976.75 | 4430 | $2,210,388.46 |
| Dec-07 | 453 | $226,216.52 | 4518 | $2,254,596.23 |
| Jan-08 | 458 | $228,478.68 | 4609 | $2,299,688.15 |
| Feb-08 | 462 | $230,763.47 | 4701 | $2,345,681.91 |
| Mar-08 | 467 | $233,071.10 | 4795 | $2,392,595.55 |
| Apr-08 | 472 | $235,401.81 | 4891 | $2,440,447.46 |
| May-08 | 476 | $237,755.83 | 4988 | $2,489,256.41 |
| Jun-08 | 481 | $240,133.39 | 5088 | $2,539,041.54 |
| Jul-08 | 486 | $242,534.72 | 5190 | $2,589,822.37 |
| Aug-08 | 491 | $244,960.07 | 5294 | $2,641,618.82 |
| Sep-08 | 496 | $247,409.67 | 5400 | $2,694,451.19 |
| Oct-08 | 501 | $249,883.77 | 5508 | $2,748,340.22 |
| Nov-08 | 506 | $252,382.61 | 5618 | $2,803,307.02 |
| Dec-08 | 511 | $254,906.43 | 5730 | $2,859,373.16 |

 Figure 3. Pro Forma analysis of cash flows based on estimated sales figures before and after Katrina

### FINANCING

 Alan had a lot to consider on a number of matters before he could even think of proposing possible options to the senior staff regarding finances. His mind was reeling. The news was just too good, it looked like a factory might need to be built. Alan evaluated the current debt of the firm. Although millions of dollars would need to be generated and equity offering (stock sale) was out of the question. Alan knew that the shareholders would never approve a dilution of their interest and they did not have the funds to invest for a project this large. The financing for the new factory would have to come from debt. This worried Alan greatly.

### THE BREAKEVEN POINT

 Alan also had to prepare a breakeven point (BEP) for the top management of the firm. One thing they were sure to investigate was how quickly their investment would be recovered. Alan would use the following formula to determine the BEP for the PowrFlo 500 project:

BEP = Fixed Cost / (average sales price – marginal costs).

Alan sure had his work cut out for himself. He wondered just which option would be best for the firm. He also wondered how the firm would finance the more expensive options. It was time to crunch the numbers. Alan closed his office door and opened his laptop. It would be a long evening.

## CONCLUDING COMMENTS

Making decisions under conditions of risk and by using leverage is difficult. Competitive forces would also have an effect on the decision. The proper course of action for a firm in such a situation is based on a number of considerations. This case can be used to help students to identify options before a final decision of action is made.

**INSTRUCTIONS FOR ACCOUNTING AND FINANCE STUDENTS**

After breaking into two or more groups complete the following (additional research is needed).

1. **As a Group:** Using Table 1 in the case duplicate the sensitivity analysis of the production points for the three options considered in the case by management: 1) Build an entire new production facility that would enable GEI to produce all of the products it needed, 2) Outsource production to build partners, 3) Expand the existing GEI facility to increase production. Construct these in a spreadsheet resembling the following (start with 100 units and increment the units upward by 100 units until you have calculated it to 30,000 units:

|  |  |  |  |
| --- | --- | --- | --- |
|   |   |   |   |
|   | Option 1 | Option 2 | Option 3 |
|   | New location | Subcontract | Expand |
| Fixed costs | $4,000,000.00 | $0.00 | $1,250,000.00 |
| Variable cost | $55.00 | $255.00 | $155.00 |
|   |   |   |   |
|   | **Total costs per proposal – fixed and variable** |
|   | **Plan A** | **Plan B** | **Plan C** |
| Units | **New location** | **Subcontract** | **Expand** |
| 100 | Calculate this | Calculate this | Calculate this |
| 200 |  |  |  |
| … |  |  |  |
| … |  |  |  |
| … |  |  |  |
|  … |  |  |  |
| … |  |  |  |
| 30000 |  |  |  |

1. **As a group:** Review the spreadsheet created above as a group and identify the production points where each option is attractive. Draw a chart (by hand or with spreadsheet software) showing the total cost lines of the three options. Plot total cost on the Y-axis and units of production on the X-axis for the three options. Identify the option that makes the most financial sense for the firm for 12,000, 13,000 and 28,000 units.

### Net Present Value

1. **As a group:** Review Figure 3 that shows the cash flows estimated before and after Katrina. Calculate the NPV of cash flows for each stream of cash before and after Katrina using a discount rate of 9%. Remember that Figure 3 uses monthly cash flows and the discount rate is an annual rate. Use the following format (only part of Figure 3 is shown below).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|   | Old Sales Estimate | Old NPV of cash flow | New Sales Estimate | New NPV of cash flow |
| Date | for PowrFlo 500 (units) | sales price of $499.00 | for PowrFlo 500 (units) | sales price of $499.00 |
|   |   |   |   |   |
| Oct-05 | 350 | Calculate this | 2700 | Calculate this |

### Break Even Point

1. **As a group:** Use the fixed costs (Figure 1), the marginal cost per unit (Figure 1) and the average revenue per unit ($499.00) to calculate a Breakeven point in units for each of the methods (expand, outsource, new plant) in Figure 1.

**Other opportunities**

1. **As a Group**: How might the service plan to maintain generators be used by GEI to provide a future revenue stream?