

Study case 17 – Florida Glass Company

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### Executive Summary of the Case

The Florida Glass company is located in Seffner and used to manufacture laminated, produced float, and glass tempered in its 37,500 square feet for every month plant. It made use of the float process for its glass manufacturing and used oil to fuel its furnaces with electric boosters. Florida Glass was the most profitable company in the industry despite its not being located in the states that were glass producing of Tennessee, Ohio, Pennsylvania, and Ohio, where there were readily available and less expensive raw materials. In the year 1981, the company recorded over 4% sales returns compared to a 2% return for the rest of the industry (Allender, 2018).

Florida Glass's excellent performance was attributed to its development of a strong position in an attractive market niche. Also, the success was as a result of having paid a keen attention to the efficiencies in manufacturing, mostly with the energy regard. As a whole, the flat-glass industry had been weak for the past 5 years, and over the period the Florida market had been strong moderately. The Florida's architectural designs persistently continued to be oriented on glass in a heavy manner. The commercial and residential construction had been so persistent despite the conditions with the economic condition of the nation. As a result, the glass product demand still remained so strong. Since the year 1951 when the Florida glass company was founded it had made some self-marketing and had established itself as the market's leading supply. Florida Glass Company's material manager Oscar Paik reviewed his day planner he realized that the Energy Planning Model monthly run was scheduled for today. This energy planning model calculated the product's optimal mix for the next month. Previously when the model's results were received by Paik, he places an order for the quantity that was recommended of distillate fuel oil. The model came up with monthly based calculations, and consequently, it

resulted in ignoring the chance of purchasing more than a month's distillate supply, even though there was an availability of an ample storage capacity. Paik had never before taken an advantage of relatively low prices even with his strong belief that there would always be a rise in the subsequent month. In the last five years, the sales of the Glass Company had been enough to keep the operations of the plant going on at a capacity that nears full. Ranges of certain products were allowed by the plan when it was permitted by the conditions of the market. The ranges allowed flexibility in the planning of production so that the product mix could be changed in an effort of maximizing the profitability. A key factor in the efficient operations of the Florida Glass company was flexibility. The company made some adjustments in its mix in order to control the expenses of energy when the costs of energy affected the industry severely.

### **Decision Problem**

The Florida Glass company's material manager Oscar Paik realized that the Energy Planning Model was scheduled for that particular day. The model is used to make calculations for the optimal mix of products for the following month and the quantities of energy (distillate-fuel oil and electricity) required. Previously when the material manager received the energy planning model materials, he made an order for only the recommended amount of distillate fuel oil. Later, Oscar, the material manager, decided to question his perfunctory of making monthly orders for the distillate as the model made monthly based calculations. Consequently, the model ignored the opportunity to make purchases of more than a month's distillate supply despite having an ample capacity for its storage. Over the previous years of the volatility of oil prices, the manager had never taken advantage of relatively low energy prices. The 1982 month of October seemed to be the best ideal period to address the policy concerns on single-month

purchases. Oscar had never thought of taking advantage of low prices of distillate, even with the oblivious speculations of the rise in the distillatory prices in the following months (Allender, 2018).

**The situation is another of such similar opportunities. The manager was positively convinced that the prices he experienced at the end of September indicated low temporal prices for distillate. Park believed that the most appropriate time to address the single-month purchases policy would be the end of October, which will be the next time that he would typically be purchasing the distillate at the prices of approximately 94.5 to 98.0 cents. The Florida Glass Company used two primary energy sources, which were electricity and distillate fuel, for the process of manufacturing. The process of melting furnaces was fired by distillate and the kilns' heating, furnaces tempering grinding and cutting wheels in the final area. This indicates that if there were a problem with the supply of energy sources, manufacturing would not occur in the company. There was a need to guarantee a continuous supply of energy sources in the company as the majority of the company's work is to manufacture. The availability of sufficient energy storage capacity for up to 32,000 gallons in the company's premises encouraged the need to make more purchases of energy when the prices were considered low. There was a need to develop a better method of predicting. The one-month purchase policy should be replaced by a**

**better policy, which will allow the purchase of more energy products to avoid trouble in situations like when there happen to be shortages in power that would disrupt operations. The local utility is used to supply electricity, and the billing was based on usage and peak demand. The measurement for demand was in terms of the peak kilowatts demanded in 30 minutes during the billing month. The billing charges were directly related to the capacity of production amount brought online. There was a variation of usage charge from one month to the other, depending on the production mix.**

### **Decision Alternatives and Evaluation**

#### **1st Alternative Method**

**Oscar Peik has an alternative of choosing from the following three alternatives of making calculations for optimal mix products for more than a month's products and energy quantities to take advantage of buying in bulk when the opportunity of low prices present. The first alternative is the forecasting method that uses historical data of the previous year in determining the purchases. This method helps to fine-tune the market mix to focus on the most-profitable events for the company. The method helps to know which period had been more profitable in the past**

due to lower prices for products and energy, hence helping plan for changes in future purchases. Based on this approach, it is expected that the pattern prices of distillation and other past products will be similar to future prices. Therefore the company will be expected to purchase more in the month when prices of the product low. Then the store for use in the months when the prices increase. This alternative method allows flexibility in production planning so that there could be an alteration in the product mix to maximize profitability.

**Table 1: Alternative No. 1**

**Percent based on 2011's operating statement**

	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>Total</b>
<b>Shipments</b>	<b>217.8</b>	<b>70.6</b>	<b>61.2</b>	<b>349.6</b>
<b>Revenue</b>	<b>\$292.2</b>	<b>\$225.4</b>	<b>\$222.6</b>	<b>\$740.2</b>
<b>COG (including energy)</b>	<b>62.1</b>	<b>42.7</b>	<b>94.3</b>	<b>199.1</b>
<b>Energy cost</b>	<b>62.5</b>	<b>92.9</b>	<b>62.9</b>	<b>218.3</b>
<b>Energy credits</b>	<b>62.7</b>	<b>92.5</b>	<b>22.9</b>	<b>178.1</b>

<b>Selling, admin., R&amp;D</b>	<b>21.2</b>	<b>21.6</b>	<b>21.6</b>	<b>21.6</b>
<b>Total cost</b>	<b>204.6</b>	<b>207.7</b>	<b>204.9</b>	<b>204.9</b>
<b>Income before taxes</b>	<b>21.7</b>	<b>(2.9)</b>	<b>21.9</b>	<b>41.2</b>
<b>Income after taxes</b>				<b>21.3</b>

### **2nd Alternative Method**

**The other alternative approach is a forecasting method that can forecast in the long run of distillate monthly prices. This data is supposed to assist in determining the manufacturing product mix for the following month. In the manufacturing process of Florida Glass Company, the two primary sources of manufacturing fuel was electricity and distillate fuel. This alternative method has been used before by other companies to estimate the monthly check volume of products. For a long time, the Florida Glass company had been purchasing distillate every one month, only sufficient to fuel the following month along even with the availability of an adequate storage capacity in the company premises to store for more. The one month purchase**

had been adopted for several reasons like previously there had never been shortages of fuel. The monthly purchases of distillation were always available in the market for purchases. Also, the needs for working capital were minimized, and short-term money was kept to the least amount, and finally, the company used to save from the avoidance of the delivery charges. The end of the month fuel prices of the previous three years paid by the Florida Glass company is shown in the table below. Therefore, the data can be used to forecast a long-run of fuel distillate for the company.

**Table 2: 2nd Alternative**

**Long-run forecast range**

<b>Month</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>
<b>January</b>	<b>76.82</b>	<b>94.25</b>	<b>99.11</b>
<b>February</b>	<b>77.77</b>	<b>92.22</b>	<b>94.69</b>
<b>March</b>	<b>78.94</b>	<b>92.25</b>	<b>97.42</b>
<b>April</b>	<b>78.25</b>	<b>92.25</b>	<b>94.99</b>
<b>May</b>	<b>78.33</b>	<b>92.29</b>	<b>94.16</b>

<b>Jan</b>	<b>92.2</b>	<b>92.39</b>	<b>92.48</b>
<b>July</b>	<b>92.14</b>	<b>92.01</b>	<b>92.01</b>
<b>August</b>	<b>92.28</b>	<b>92.16</b>	<b>92.01</b>
<b>September</b>	<b>92.35</b>	<b>92.34</b>	<b>92.65</b>
<b>October</b>	<b>92.74</b>	<b>92.89</b>	<b>94.89</b>
<b>November</b>	<b>92.89</b>	<b>92.82</b>	<b>94.89</b>
<b>December</b>	<b>92.89</b>	<b>92.85</b>	<b>94.11</b>

**3rd Alternative**

**The Florida Glass company can still use an alternative method to make optimal mix predictions to minimize the cost of production in the company, referred to as the exponential smoothing method. The exponential smoothing method gives the 1st and 2nd alternative methods of equal weights. The local utility supplied the electricity, and its bases for billing were on the optimal demand peak and its usage in the Florida Glass company. Peak kilowatts are what was**

used to measure the demand for energy required in thirty minutes during the month of billing. The exponential smoothing as a forecasting device for sales and a device used for demand prediction for inventory and production control purposes is relatively very accurate, time conscious, and more efficient in its application than other techniques used for conventional forecasting. For some time, the glass company had operated at a capacity the monthly peak demand was unchanged virtually from different months, and that was treated as the fixed expenses. Exponential smoothing is a simple procedure that is supposed to make calculations for a weighted moving average. The highest weight is usually assigned to the most recent data of sales that are predicted or actual. The exponential smoothing discusses some simple and useful methods: computational simplicity, accuracy, and flexibility to make adjustments in the predictions to the response rate of the system that is forecasting. It is of no value to working with a system that has an economic status that is complicated. The devices commonly used for forecasting are presented, and an analysis of their strengths and weaknesses is discussed. Among the tools for statistical forecasting commonly utilized are the analysis for time series, analysis correlation, and an average that is moving (Stevens, Williams & Smith 2009).

### **Analysis of the Three Approaches**

**The use of the previous year's historical data to determine the products and energy necessary in minimizing costs will result in the maximum products required. This method's decision is entirely based on previous year's products, having the highest probability of inaccuracy and biasness. There are several things to consider, which could result in over-approximation of the energy and products required in the Glass Company. Failure to develop an optimal budget for the product mix would lead to unnecessary high product costs. The other alternative method that forecasts monthly prices of distillate, in the long run, is based on the seasonal adjustment budget as there are fluctuations over the period. There could be some inaccuracy with the approach as it fails to consider the recent check patterns in the Florida Glass company (Shahid et al., 2009).**

**The company has been experiencing different growth trends; therefore, this could result in under budgeting of the products and the energy required. This could lead to low-quality products by the company or even result in running out of energy supply in case it is short in supply. The last alternative, which is exponential smoothing, offers the first and second alternative an equal weight. Thus it puts into consideration some multiple factors. There is less**

**risk attached to the approach. The exponential smoothing is a sum that is weighted for all the past demands, with the heaviest weight being placed on the most recent information. This alternative is set to overcome the limitations of moving average. It replaces the need to keep past data in the extensive records. The approach can see the change in the picture of demand and the ability to make a track in the demand change pattern. The technique of exponential smoothing may be able to account for trends that are seasonal and for long-term impact. The approach can also accommodate uncertainties in the estimates of management. With equipment for data processing, a program of exponential smoothing can regularly update thousands of forecast items and avail inventory controlling information much better than it could be achieved manually (Khalid et al., 2019).**

### **Recommendations**

**The choice of the appropriate forecasting technique is very crucial for the company to operate effectively and efficiently. Exponential smoothing is more effective and consumes less time when applying techniques for forecasting conventional techniques. As a device forecasting sales and demand prediction, exponential smoothing is more accurate than other forecasting approaches. The method is simple, more accurate, straightforward, flexible, and more**

**computational in adjusting predictions in the forecasting system. It is usually very convenient and more necessary to work with an economic indicator that is complex. More arguments are valid that are presented to prove that the exponential smooth is significant advantages within the Florida Glass Company. The technique is the most successful method according to academic discussions as well as practical applications. Unlike other forecasting methods, the method requires less data than any other method of forecasting while remaining more flexible as a more modified forecast can be formed by just changing the smoothing's constant. Whenever it is in conjunction with the equipment for processing data, exponential smoothing allows the possibility of forecasting demand accurately every week. It allows an easy adaptation of a high speed of electronic computers so that the demand and detection that is expected of trends correction can be measured as a matter of routine. The method makes it possible to make measurements of distribution that is current for errors of forecast item by item. Consequently, the approach of exponential smoothing is suited well, particularly for forecast items which may be required for determining re-order points, planning materials, quantities of the economic order in management materials and production control scheduling (Munawar et al., 2009).**

**The exponential smoothing alternative has many advantages over other alternative**

**approaches. This is so because it yields accurate forecasts with the availability of minimal information. The approach responds more rapidly to sudden changes in the demand chart. From the paper, it is very visible that a system does not need to be complex and ambiguous. The field research has confirmed this hypothesis. The majority of the companies quoted indicate that exponential smoothing in the form of a simple system of demand forecasting can be seen as a necessity for the cost of a complex system that would not justify the results. It is important to recall that the forecasts are made for several products. Forecasts should be held on a routine basis so that predictions can be quick and at a low cost in time computing and storage of information (Gross, Williams & Smith, 2004) .**

### **Conclusion**

**Florida Glass Company had a material manager referred to as Oscar Park, who placed orders for the recommended quantities of distillate— fuel oil. The company used an energy planning model to make calculations for optimal product mix for the following month. Previously the manager used to place orders after receiving the model results for the recommended distillate fuel oil. However, on this particular day, Oscar decided to question the usual monthly ordering of distillate as directed by the energy planning model, calculating the**

**optimal product mix for the coming month. This model made monthly based calculations ignoring the possible opportunities of making purchases of more than a month's supply of products of production and distillate (Purwan, Wikiana & Harah, 2019).**

**The model recommended one month's purchases even with the availability of an ample storage area for the products within the company's premises that could accommodate more than a month's products. Over the previous years of the volatility of oil prices, Paki, the material manager, had never taken or enjoyed the advantage of relatively lower energy products' prices even when there was very high speculation of rising of the energy products' prices in the following month. At this point, Oscar was convinced that urgent action needed to be taken to address the single month's purchase policy. He knew that the ideal period to address the problem was at the end of October. He was to make purchases in bulk taking advantage of the months when the energy products' prices are costing the least. The ranges in certain products when the conditions of the market permitted gave flexibility in the production planning so that the product mix could be changed to maximize profitability (Pakhusat et al., 2019).**

**The flexibility was significant to the efficiencies of the operations at the Florida glass. The costs of energy severely affected the industry resulting in Florida Glass adjusting its mix to**

**control energy expense. The Florida Glass Company needed to address making purchases for one month's energy products. It needs to adopt a system where it takes advantage of low prices of the product and store for use in the months where the prices are high. The energy production mix model should evaluate so that to take advantage of the opportunity of low prices. One alternative method for forecasting and making energy product purchases is the use of historical data of the previous year to come up with the purchases to make. The method fine-tunes the market mix to put the focus on the most profitable events for the company. The method helps in knowing the most profitable events for the company. The pattern in this approach assumes that the future will be similar to the past. The other used alternative is forecasted on a more extended period on the monthly prices of energy products. The data is supposed to help in knowing the necessary product mix for manufacturing. This method has been employed before by other production companies, and it has worked well. The third suggested alternative method is the exponential smoothing method. The approach is supposed to help make wise predictions to take low price opportunities and purchase energy products to minimize production costs. This exponential smoothing approach offers the first and second alternative methods of equal weight.**

**The local authority supplied the energy and its billing bases on the maximum peak for demand and its use in the Fluid Glass Company (Munoz et al., 2009).**

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