

Erin's Energy Plan

The discussion was getting heated. A brightly colored chart at the front of the room told the story all too well. At Waylan Industries sales were up, profits down.

"Larry, there's no way we can hit our profit objective with your high cost of production. You've got to cut back."

"Why pick on me? We're running bare bones as it is. Last winter's energy prices really killed us. How can you cut costs with a 250% increase in energy prices?"

Everyone stared at Erin. Erin swallowed hard and spoke up. "You know, we've never had to stockpile fuel before and I'm not sure how far we

can go in managing demand, but I've been collecting data on purchase options. . . ."

"Well, let's see it then."

"Although it's not how we purchase energy, I've converted the prices to millions of BTUs for comparison. Coal costs \$8 per million BTUs, but we can only burn 500 million per quarter to stay within our environmental air standards. Natural gas costs \$32 per million BTUs, and petroleum \$46. We can burn 1000 million BTUs of each per quarter. Coal and natural gas can be stored for later use at a holding cost of 30 percent of purchase price per quarter. The holding cost for petroleum is 20 percent. Electricity cannot be stored, but it can be reserved in

advance. The cost of electricity also varies considerably by season of the year, as do our energy needs. The cost of electricity from the local utility is \$20 per million BTUs in the spring, \$40 in the summer, \$24 in the fall, and \$70 in the winter. These are averages from last year. A nearby utility quotes slightly higher prices at \$22, \$44, \$26, and \$75 for spring, summer, fall, and winter. As far as availability is concerned, 4000 million BTUs of electricity are available in the spring and fall, 5000 in the summer and winter. We can save some money by

contracting with the utilities in advance of the season. I've summarized the options in the table here, along with our energy needs. What I need now is some help analyzing the data. Larry, could you . . ."

Before Erin could finish, Tom spoke up. "Yes, Larry—you and Erin work up an energy plan—like those aggregate production plans you're always bringing in. And have it ready by Thursday."

Source: This case was developed with the help of Richard Hirsh, Professor of Science and Technology at Virginia Tech.

| PURCHASED IN | USED IN | | | | | | | |
|-----------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Spring | | Summer | | Fall | | Winter | |
| | Utility A | Utility B | Utility A | Utility B | Utility A | Utility B | Utility A | Utility B |
| Spring | \$20 | \$22 | \$40 | \$44 | \$20 | \$22 | \$45 | \$50 |
| Summer | | | \$40 | \$44 | \$22 | \$24 | \$50 | \$60 |
| Fall | | | | | \$24 | \$26 | \$60 | \$65 |
| Winter | | | | | | | \$70 | \$75 |
| Demand | 1500 | | 5000 | | 5000 | | 10,000 | |

Use Erin's data to develop an aggregate energy plan for Waylan Industries.