

Department of Industrial Engineering & Operations Research

IEOR 162: Linear Programming & Network Flows (Spring 2021)

1 Project

The project consists of modeling and providing a computational solution to the **Buckeye Power & Light Company** case written by Sherwood C. Jr. Frey and Robert I Carraway. You can buy and download the case [here](#), or find it on your own.

Back to 20th century, coal was an important fuel for industry. But the mining and burning of coal has contributed heavily to climate change. Now people are using clean energy, such as gas, renewable energy, instead of coal. Please be aware that this case is only for implementing your linear programming skills and analysis, not judgement of energy.

This case describes the coal-procurement process of a small electric utility in the late of 20th century. The manager of the production fuel department must decide how much coal to purchase from each vendor and how to allocate the purchased coal among the utility's three coal-burning plants.

Note: Please skip **long-term contract** section of the case and consider those long-term contracts as normal vendors in your model. Ignore the minimum order quantity of long-term contracts in Exhibit I.

1.1 Instruction

Your job for this project is to help formulate a strategy for negotiating with the vendors and to address other special issues by using linear program and sensitivity analysis. The report (**10-15 pages not including the third part, typed, double space**) consists of three parts:

- The first part should be prepared as a consulting report to the company. As such, it must contain an executive summary that can stand alone to explain everything you have done to get your results.
- The second part, the main body, should at least contain an introduction, a formulation section (decision variables, parameters, objective function, constraints...), an analysis section, and any other sections that you think can support your report. In addition, your report should include a number of recommendations/strategies and corresponding argumentation on how to purchase coal and allocate the purchased coal.
- The third part, the appendix/reference part that is not constrained by the page limit, should contain all the codes and outputs of your model(s) and solutions to the problem.

You must provide an additional technical explanation behind your recommendations: be sure to address your formulation and its correctness in view of relevant assumptions; explore your model's sensitivity to assumptions and parameters; apply appropriate solution techniques and software for the optimization problem.

1.2 Policies

You must also include all the AMPL work used to solve your problem and a log file or complete screenshots showing the solution of your model and the corresponding sensitivity output. The project is to be submitted via gradescope before 12:00 pm on April 30th, 2021. Each team only needs one submission. List all team members when submit the report.

Regarding to the team, there are two options:

- Propose your own team (3-4 people)
- Be assigned to a team

Please send one email per team to both GSIs by April 5th, including the name of all members of the team. Otherwise, send an individual email indicating that you want to be randomly assigned to a group. If you don't send the email, we will automatically randomly assign you to a team.