Compagnie Pétrolière et Gazière, INC.

REQUEST FOR PROPOSAL
RFP #: SR – S1.H1

TITLE: OIL AND GAS EXPLORATION AND PRODUCTION – PHASE 1
CLOSING DATE AND TIME: FEBRUARY 9. 2024 @ 5:00 PM

Oil & Gas Exploration and Production – Phase 1: SR – S1.H1

Background and Purpose

By responding to this Request for Proposal (RFP), the Proposer agrees that s/he has read and understood all documents within this RFP package.

Submission Details

Responders to this RFP should supply:

- A business report **up to 3 pages** (not including cover page or table of contents), including any supporting plots and tables.
- The commented code used to produce the results.

The report should address **all points described in the "Objective" section** below.

The report should be returned in the following way:

- Electronic - Moodle submission on AA503 website.

Objective

Compagnie Pétrolière et Gazière, INC. (hereafter the "Company"), acting by and through its department of *Price Analysis* is seeking proposals for analytics services. The scope of services includes the following:

- Simulate possible future values of 2024 drilling costs.
    - Currently, only previous information is available for 1960 – 2007 due to changes in reporting regulations.
    - Since the industry has changed tremendously over those decades, only the information from 1990 – 2006 will be useful for this analysis. 2007 was an outlier and should be ignored.
    - Instead of looking at the distribution of actual costs, the Company's analysts recommend simulating possible annual changes in costs to get to 2024. They have calculated arithmetic changes in the data set already.
    - Instead of focusing on costs for oil, gas, and dry wells individually, the Company's analysts recommend to treat them all equally and assume an average cost applies to them all. (HINT: You should have 48 observations. Arithmetic changes from 1991 – 2006, but you are only looking at estimating the average into the future.)
    - A recent report has come out from the U.S. Energy Information Association detailing changes in costs from 2006 to 2024 with the details here:
        - From 2006 to 2012 changes were relatively consistent in their distribution. This distribution is discussed below.
        - From 2012 to 2015 costs tended to decrease on average by 9.17% per year with a maximum of 22% and minimum of 7%.
        - From 2015 to 2023 costs tended to increase on average by 5% per year with a maximum of 6% and minimum of 2%.
        - 2024 is forecasted to follow the same increase distribution as from 2015 to 2023.

    - Previously the *Price Analysis* group has worked under the assumption that these arithmetic changes from one year to the next from 2006 to 2012 follow a Normal distribution. Use QQ-plots or formal tests to see if you agree.
    - The *Price Analysis* group would also like you to build a kernel density estimate of the distribution of arithmetic changes using the 48 observations described above (1990 – 2006). Use this kernel density to simulate the changes from 2006 to 2012 as well.
- Simulate possible future values of 2024 drilling costs under both the assumption of Normality as well as under the kernel density estimate you created (2006 – 2012) as well as the information from 2015 – 2024. Make a recommendation for which one you feel the company should use (HINT: You will run two simulations).

Data Provided

The following set of data is provided for the proposal:

- The data set **ANALYSIS_DATA** contains the following two sets of information:
    - Estimated drilling costs for Crude Oil, Natural Gas, and Dry Wells. These costs are collected from 1960 – 2007. The arithmetic annual change on these costs have been calculated.
    - Oil price projections from 2025 – 2050. There are estimates of the high, low, and actual price of oil (reference price).