



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 7, 2023 @ 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 2023 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 2023.** 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 2023 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 2022 costs tended to increase on average by 5% per year with a maximum of 6% and minimum of 2%.**
 - **2023 is forecasted to follow the same increase distribution as from 2015 to 2022.**

- 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 2023 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 – 2023. 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 2023 – 2050. There are estimates of the high, low, and actual price of oil (reference price).