# Project inception

I was reading recently about how the demand for Brent Crude [[1]](#footnote-2)at an all time high. The April 2023 International Energy Agency report noted the following:

‘For 2023 as a whole, world oil demand is forecast to rise by an average 2 mb/d, to 101.9 mb/d, with the non-OECD accounting for 87% of the growth and China alone making up more than half the global increase.’ (International Energy Agency, 2023)

Given the state of the planet it is clear we have not close to weaning ourselves off oil and I wondered if the price of petrol or diesel in Ireland is in any way linked to the price of Brent Crude oil. This is the question we want to answer.

We all hear of changes in the price of Brent Crude when it rises because we see the near immediate price increase at the pumps. I wanted to explore if and when Brent Crude falls how does it affect the price changes at the pump.

Furthermore on the 4th April Irish media warned of upcoming petrol price changes and I noticed an almost immediate uptick in prices my local petrol stations.

A sharp rise in the price of crude oil could mean motorists will pay more for their petrol by the end of the month…Brent crude oil surged on Monday by over 5% to about $85 a barrel, putting $100 a barrel back on the horizon… It takes at least two weeks for any sustained large increase in global rises in Brent crude to feed down the pipeline into price changes at petrol forecourts. (Irish Examiner Ltd, 2023)

You could argue that the petrol price is hugely impacted by geopolitical factors and other factors like inflation, exchange rates etc. but we argue that since Brent Crude is a highly traded world commodity , any World event parameters are priced in and if we have a long enough dataset ie 20 years short significant spikes should be accounted for.

This dataset gives the USD daily close of Brent crude oil, the raw product that unleaded and diesel is made from. of the

# Datasets

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| Daily Brent Oil Historical Price 12.2022 | https://www.kaggle.com/datasets/psycon/historical-brent-oil-price-from-2000-to-202204 | This dataset gives the USD daily close of Brent crude oil, the raw product that unleaded and diesel is made from. |  |
| AA Ireland Fuel Price Figures National Average Price Index each month 1991-2022 | https://www.theaa.ie/wp-content/uploads/2022/12/FuelpricesHistory\_Dec\_22.pdf | Monthly petrol prces in Ireland |  |
| Daily Exchange Rates per Euro 1999-2023 | <https://www.kaggle.com/datasets/lsind18/euro-exchange-daily-rates-19992020> | Used this dataset for the FX rate |  |
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# Data Cleaning

The **Daily Brent Oil Historical dataset** was in good condition and all we need to do was to break out the date field in year, month and day, oil is not traded on the weekends and holidays so it was about 21 days per month of trading data from 2000 to 2022

The only available dataset for **Ireland Fuel Price** was from the AA. It was a pdf from 1991-2022 listing the National Average Price Index each month (not daily). The data was pulled into excel and arranged by year, month and day. The monthly average price was allocated to the first day of each month. We then used a python function to merge it with the brent dataset based on year, month and day. We then filled in the blank day each month (approx 20) with the value of the first day of the month which was the average petrol price that month to fully populate the dataset we were going to use.

We merged the **Daily Exchange Rates per Euro 1999-2023** to get the eur closing price brent crude.

Models for forecasting oil are in this paper (Lei Yan, 2021)

References

# Works Cited

International Energy Agency, 2023. *Oil Market Report - April 2023*. [Online] Available at: <https://www.iea.org/reports/oil-market-report-april-2023> [Accessed 16 April 2023].

Irish Examiner Ltd, 2023. *Surge in crude oil and gas prices reignites concerns for motorists and utility bills*. [Online] Available at: <https://www.irishexaminer.com/business/economy/arid-41108503.html> [Accessed 4 April 2023].

Lei Yan, .Z.H.W., 2021. *Selection of Machine Learning Models for Oil Price Forecasting: Based on the Dual Attributes of Oil*. [Online] Available at: <https://www.hindawi.com/journals/ddns/2021/1566093/> [Accessed april 2023].

1. Brent Crude Oil is drilled from below the North Sea and refined to produce diesel & gasoline. Brent Crude is used to price at least two-thirds of the world's traded crude oil supplies, making it one of the most important oil benchmarks. [↑](#footnote-ref-2)