High Level Trends in Energy and Renewables

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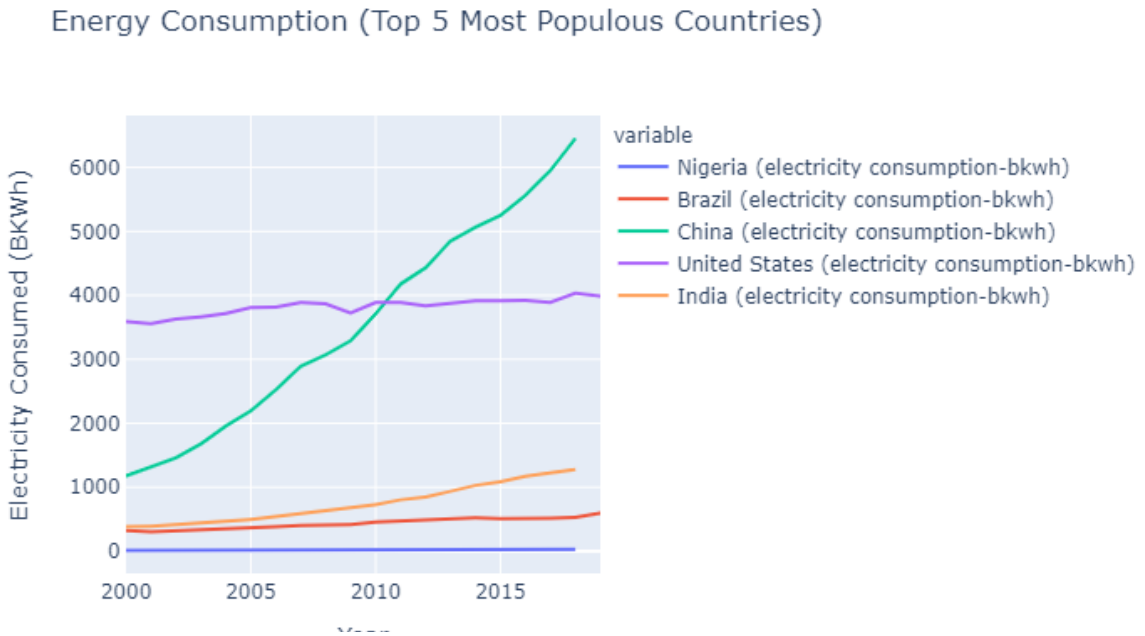
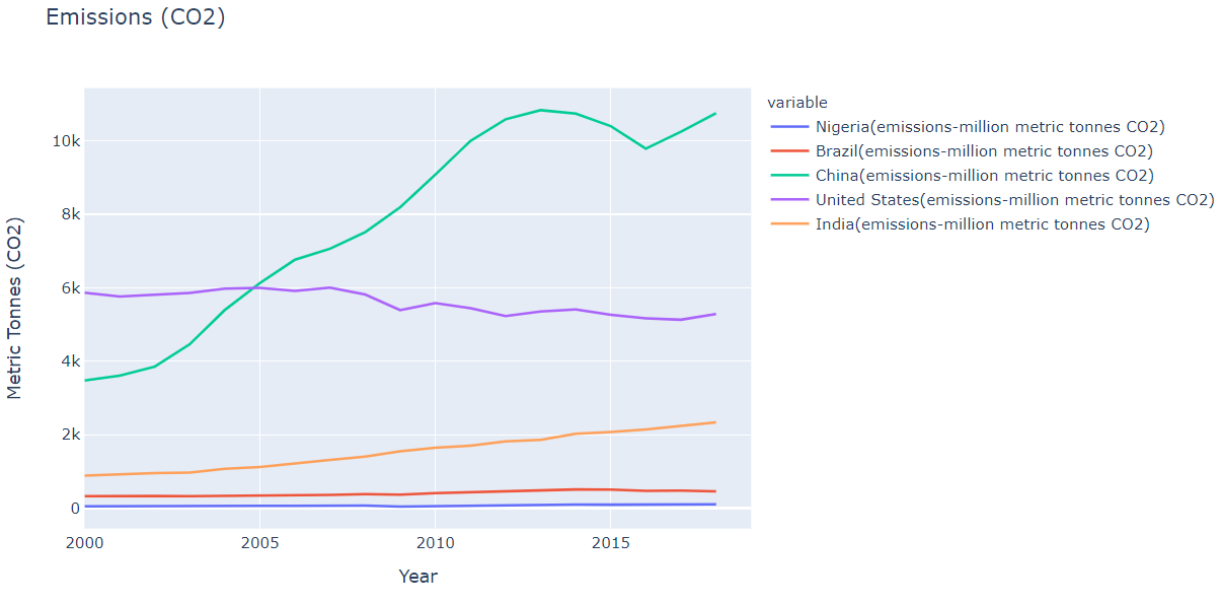
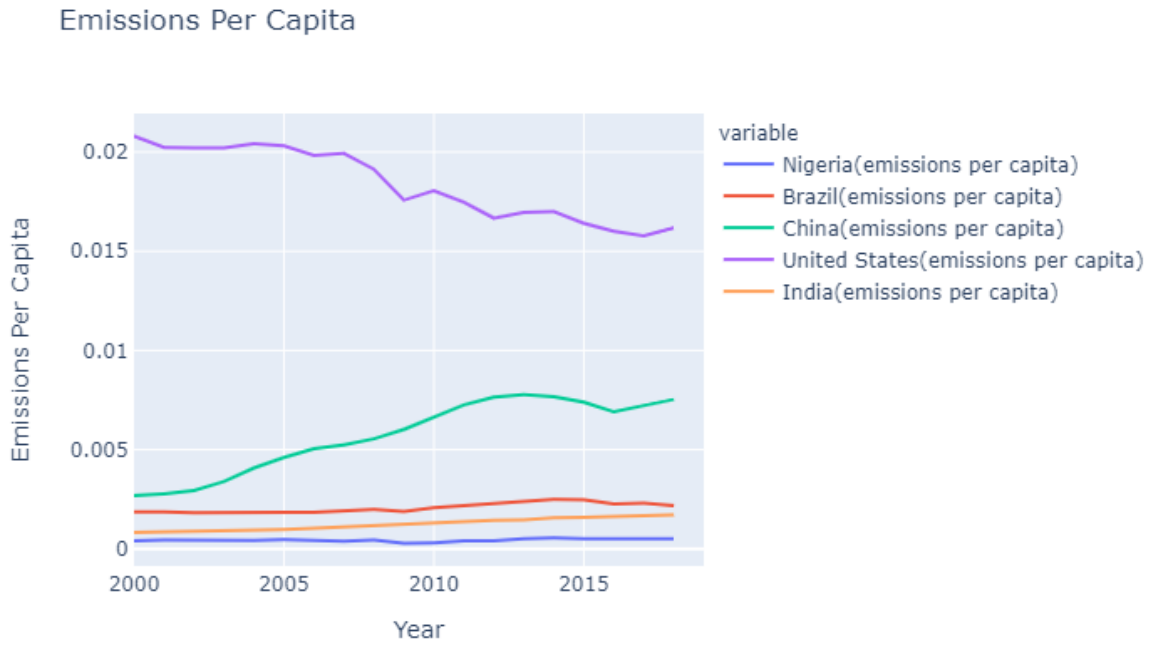
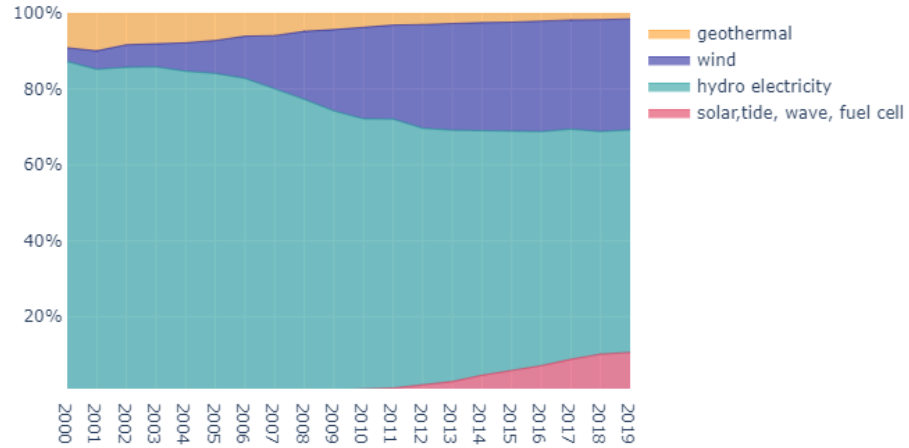




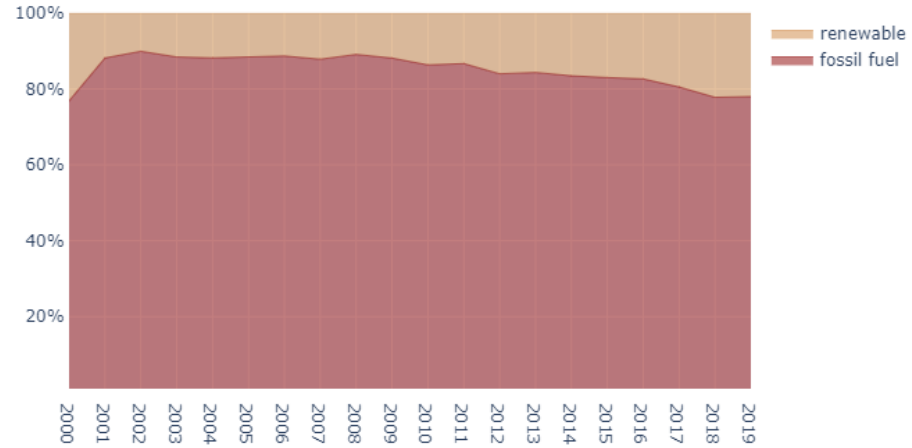


Renewable and Fossil Fuel Trends

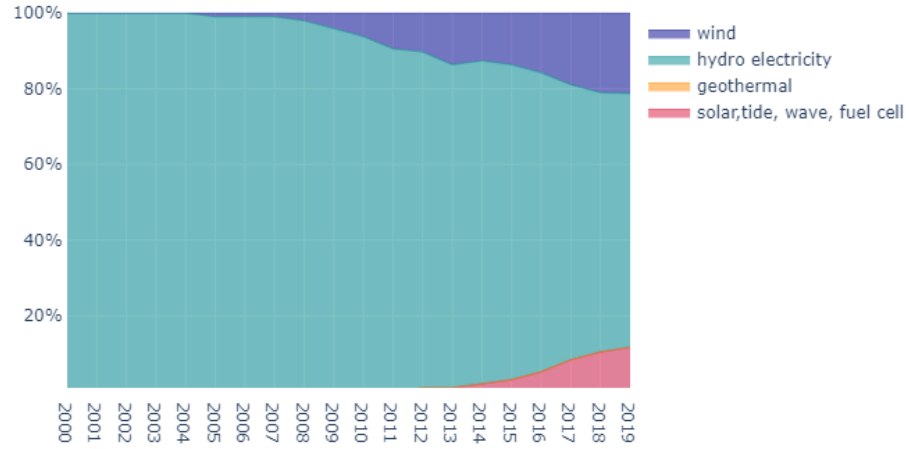
U.S. Renewable Energy Sources



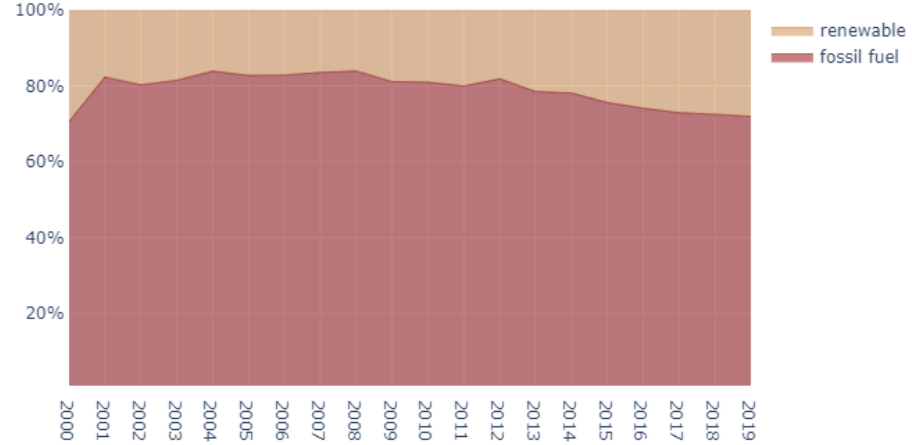
United States: Energy Sources



China: Renewable Energy Sources

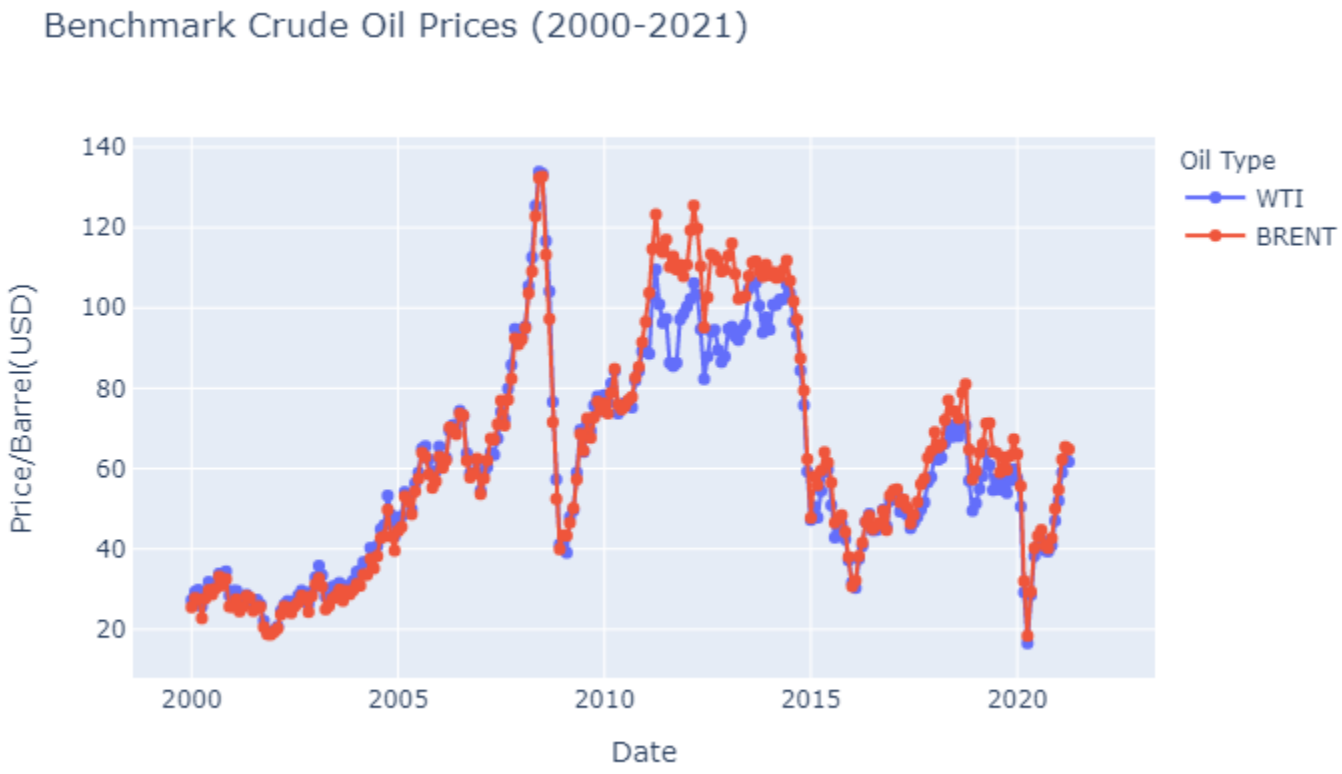


China: Energy Sources

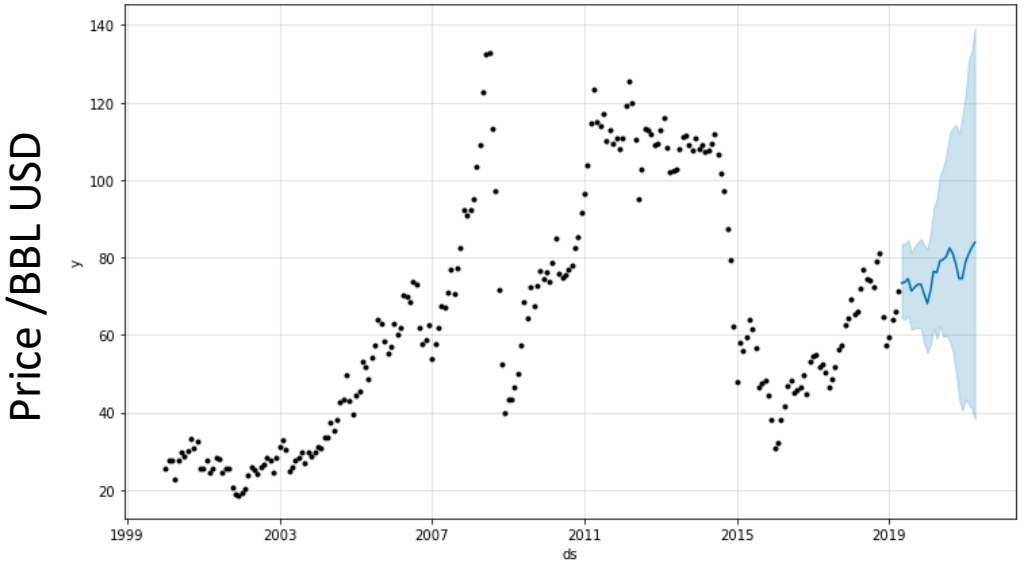


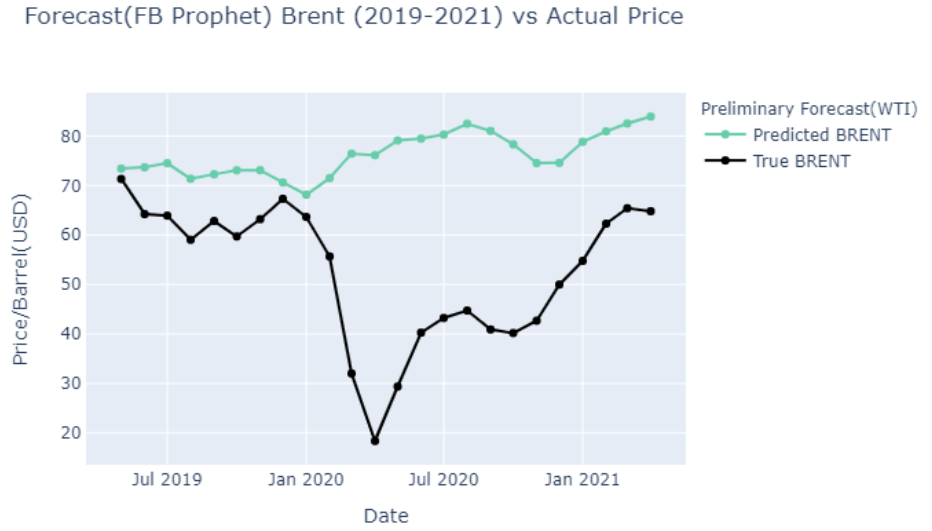
Oil Prices Through Time: What controls the price of oil?

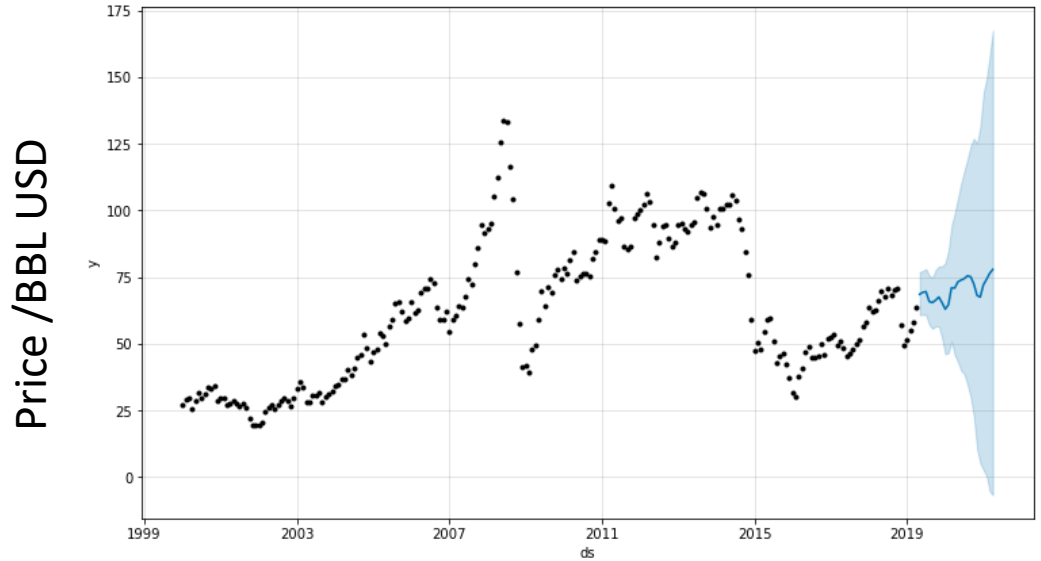
- 2001-09-11 ,9-11 attacks
- 2005-03-01 ,Low spare capacity
- 2008-10-01 ,Global financial collapse
- 2009-03-01 ,OPEC cuts production targets 4.2 mmbpd
- 2015-03-01 ,OPEC production quota unchanged
- 2020-03-01 ,Global pandemic reduces oil demand

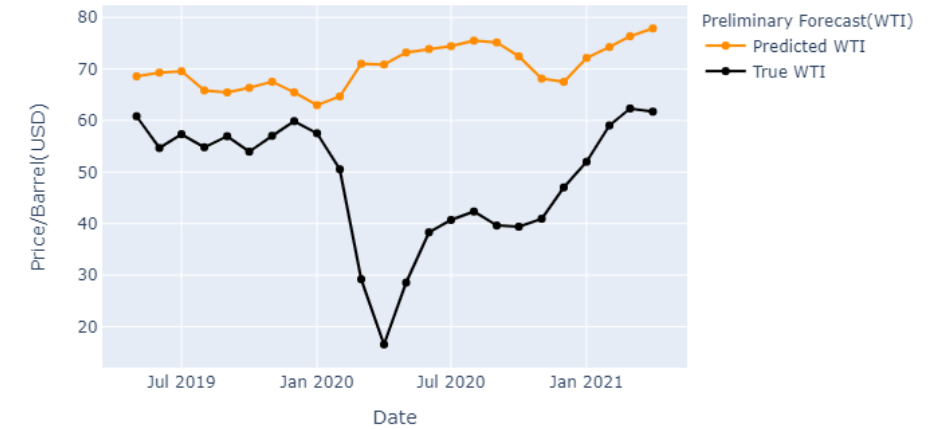


Forecasting Oil Prices Using Facebook Prophet: The Effects of a Black Swan

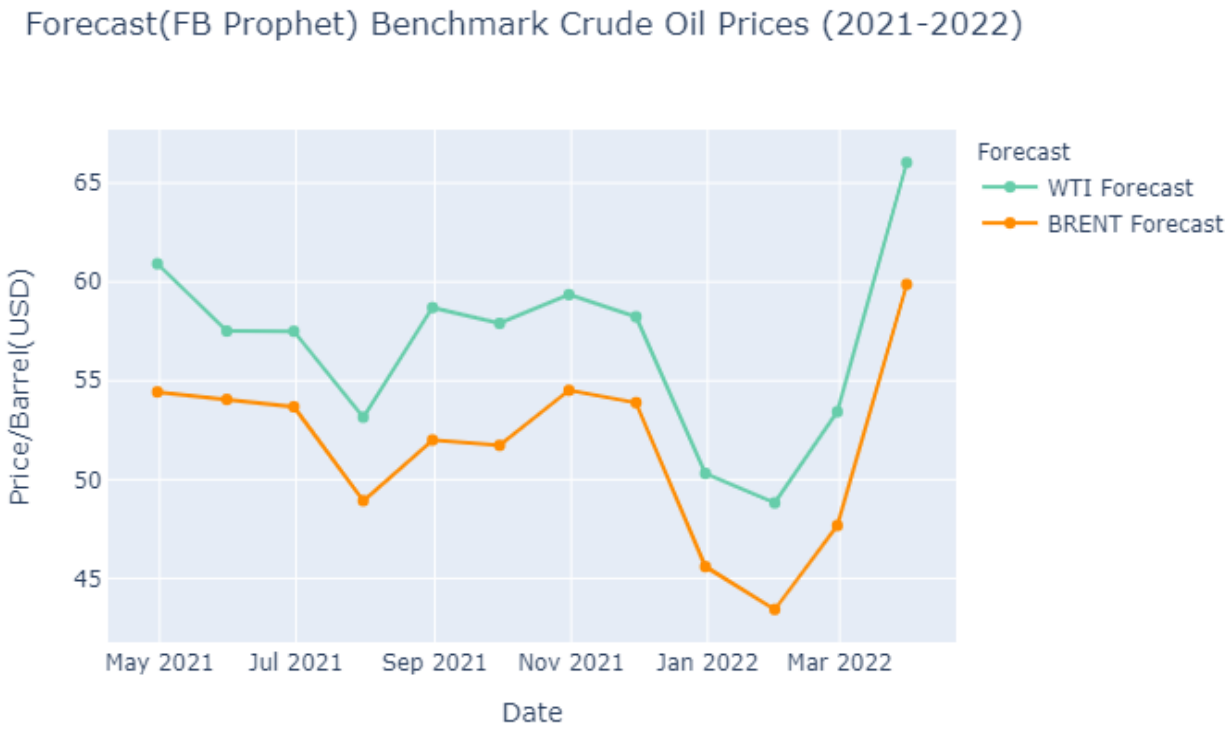


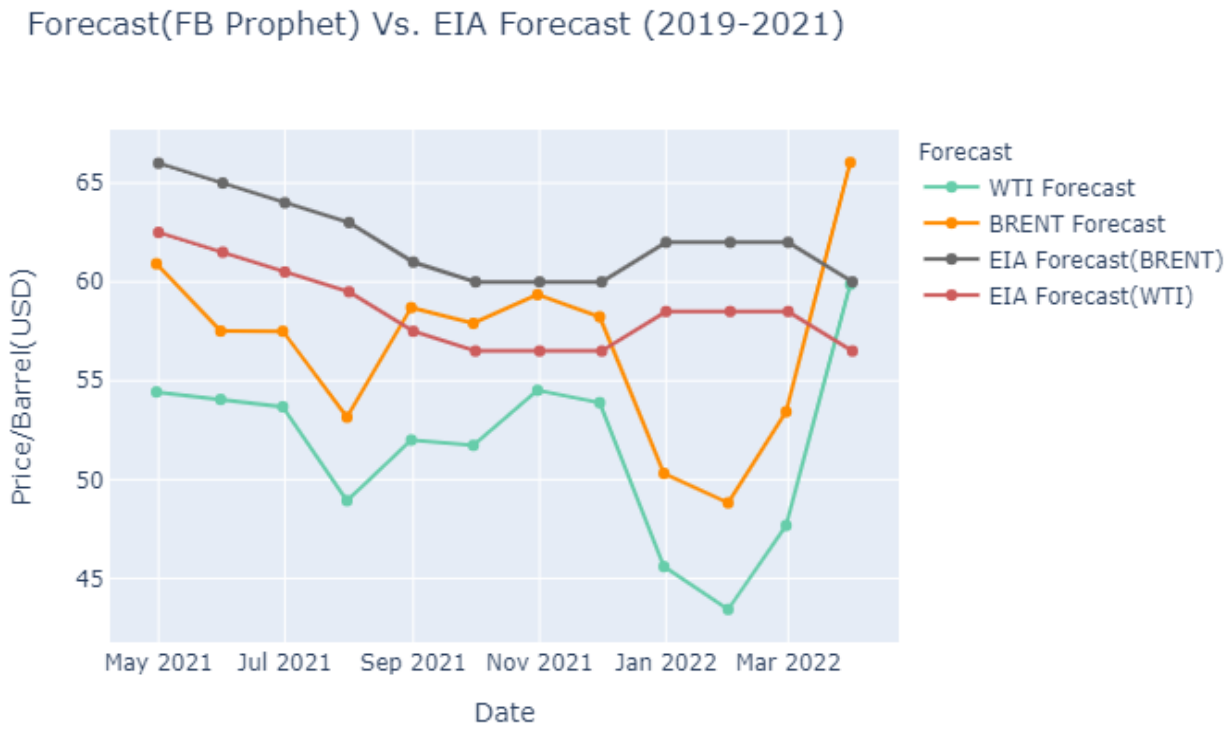






Forecasting Future Oil Prices: Complex Algorithms or Fundamental Analysis?





Conclusions and Future Work

- Climate change and the energy transition are in full swing
  - Although commitments to the transition vary widely globally
- Wind and solar seem to be the fastest growing renewable energy resource while geothermal and hydroelectric are stagnant or declining
- Oil prices are likely to remain at a point that are favorable for production, but the days of $100 oil are likely over and will likely decrease over the long term except for potential Black Swan events that limit supply
  - Long term trends show a dramatic decrease in oil by the end of the decade
- Complex algorithms have their place but should not be totally relied on over in-depth fundamental analysis although general trends tend to agree with one another
- Higher frequency data used to train forecasting model may increase accuracy of forecasting models