



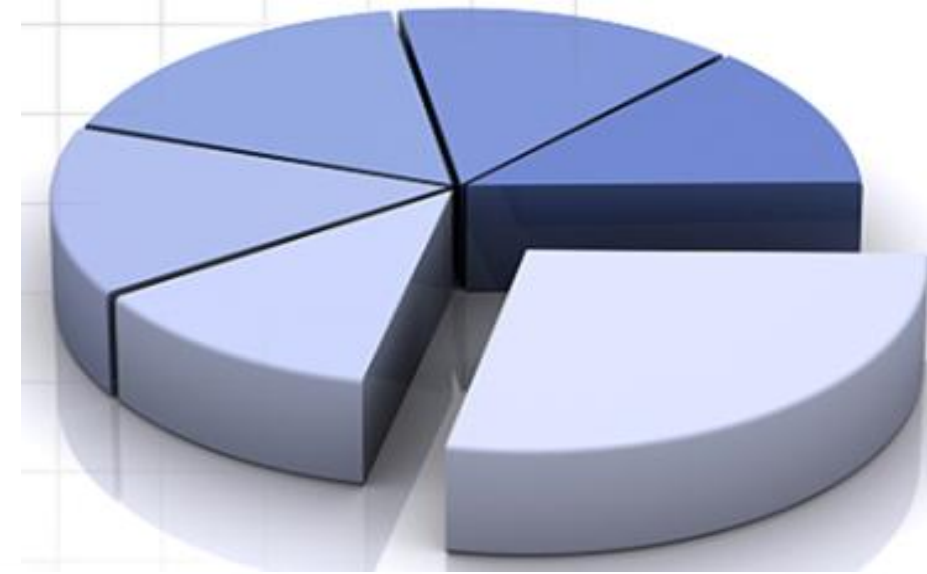
# *STUDY OF IMPACT OF ECONOMIC AND POPULATION GROWTH ON ENERGY CONSUMPTION: A STATISTICAL APPROACH*

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# Outline

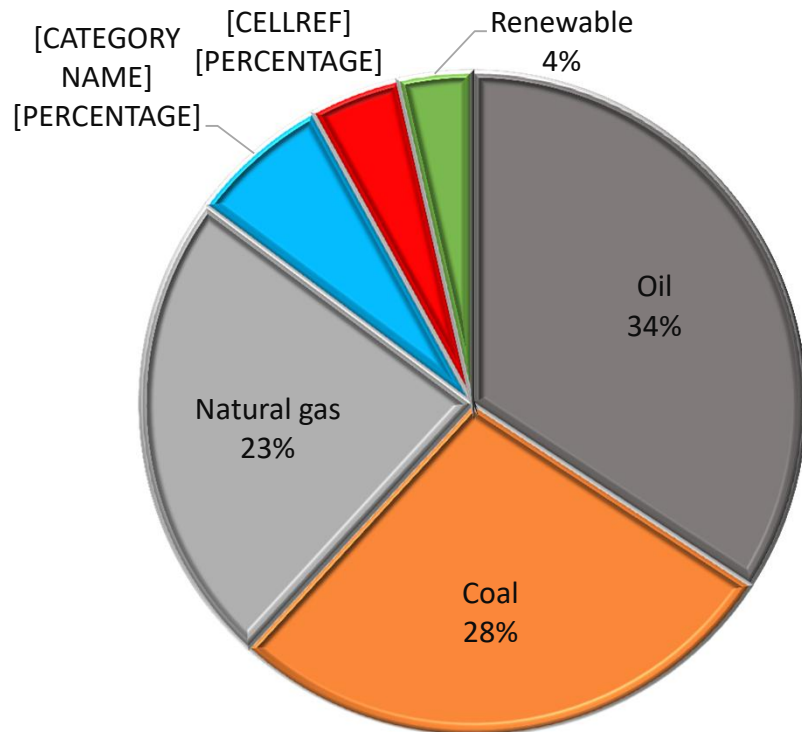



- Key Energy Statistics.
- Study Objective.
- Methodology.
- Results.
- Conclusion & Recommendation.

# Energy Consumption By Types

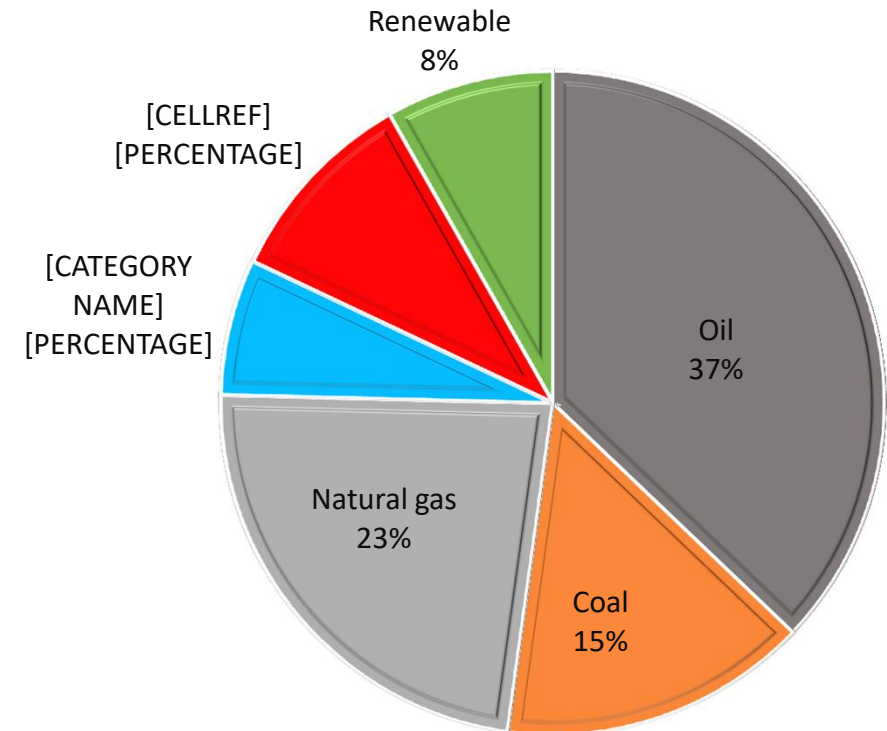



## World



- Total: 284 MMB/D
- CAGR: 1.7 % 

## Europe



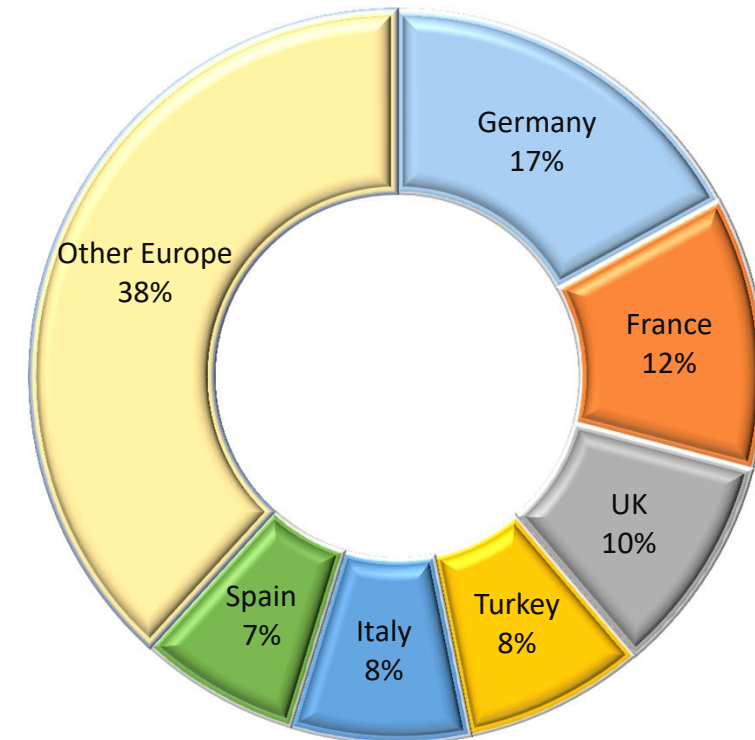
- Total: 42 MMB/D (15% of the world)
- CAGR: -0.6 % 

# EU Energy Consumption



- EU Population 510 Million (7.1% of Global Population) 0.24% ↑
- EU Countries GDP 18.8 Trillion USD (22% of Global GDP) 1.8% ↑
- EU Import 55% of its total Energy (mainly the fossil fuel).
- EU Energy Consumption represents 90% of Europe consumption.
- Three Countries (Germany-France-UK) Represent 40% of EU energy consumption

## EU Energy Consumption





# Study Objectives

- Investigate the impact of population and GDP growth on the energy consumption globally and in EU countries .
- Identify a statistical a correlation and Regression between the GDP, Population and Energy consumption.
- Suggest ( based on the analysis ) recommendations to sustain secure supply of energy for EU countries in the future

# Methodology



## Multiple linear regression:

- Statistical technique to model the relationship between two or more independent variables and a dependent variable

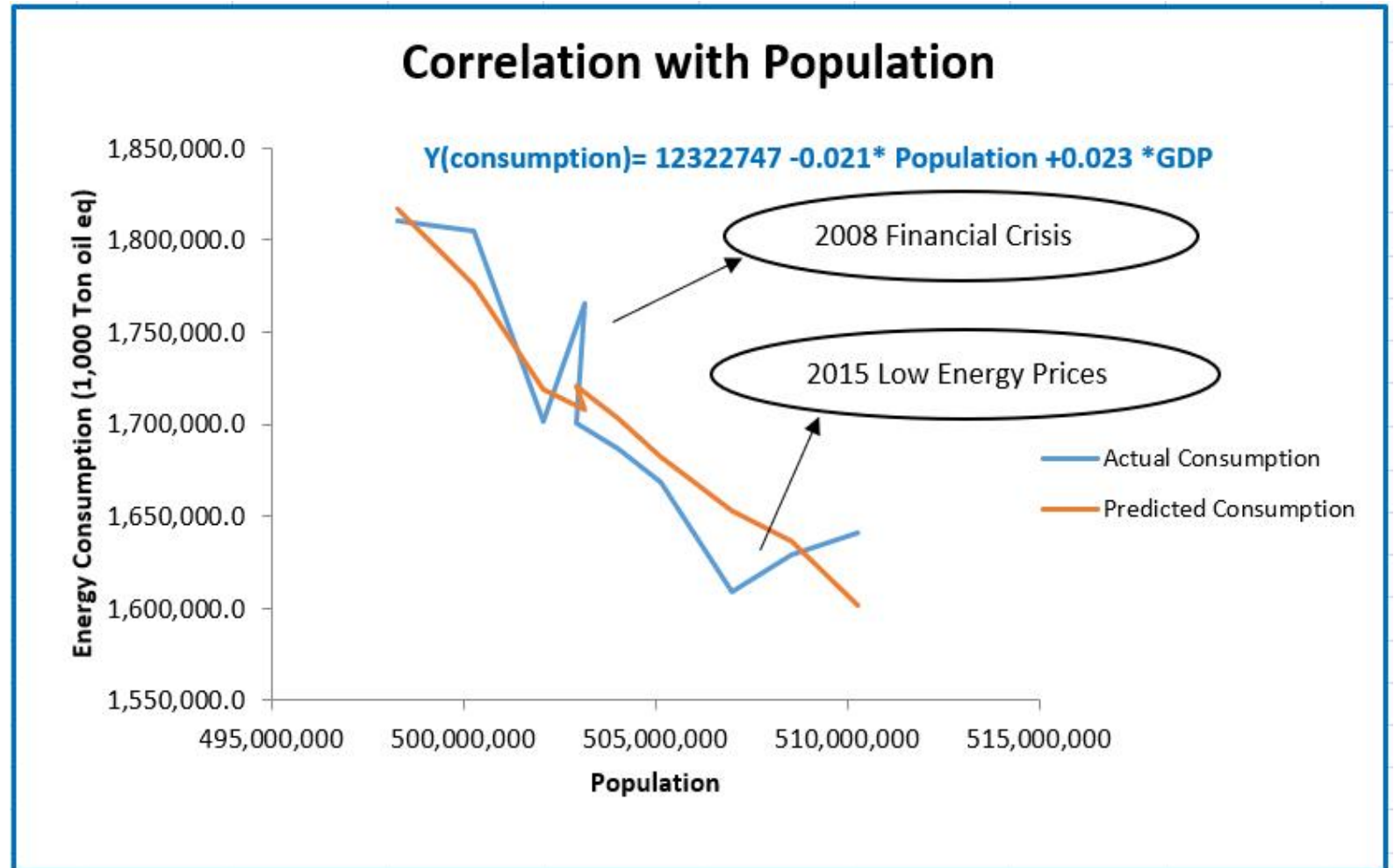
- Equation  $\rightarrow$  
$$y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2}$$

- $y_i$  : Dependent Variable  $\rightarrow$  Energy Consumption
- $x_1$  : Independent Variable  $\rightarrow$  Population
- $x_2$  : Independent Variable  $\rightarrow$  GDP
- $\beta$ : Regression Coefficient.

# Results



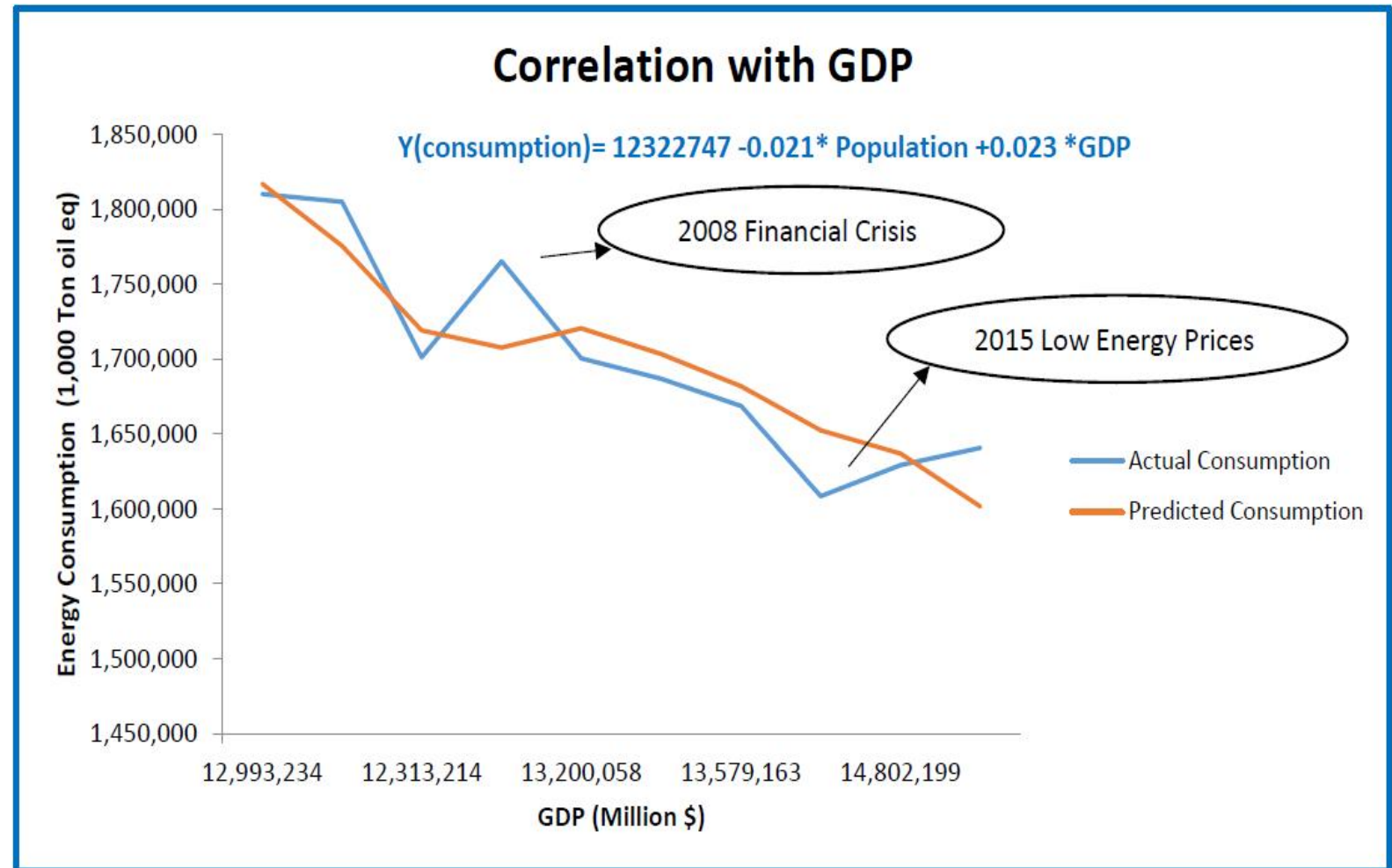
- Model shows negative Correlation with Population !!!
- Low energy prices stimulate the energy consumption.
- EU consumption Pattern is opposite to the rest of World.



# Results



- Positive Correlation with GDP but model shows insignificant relationship P-Value > 0.05
- Low energy prices stimulate the energy consumption.
- EU consumption Pattern is opposite to the rest of World.

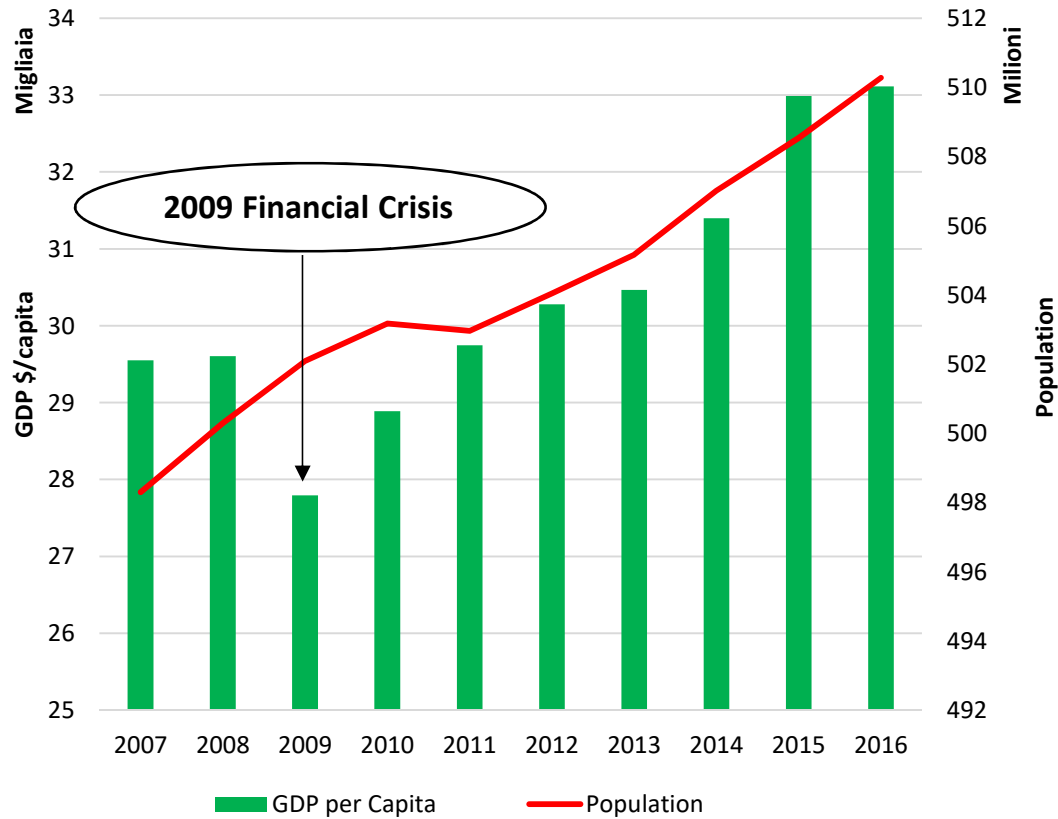




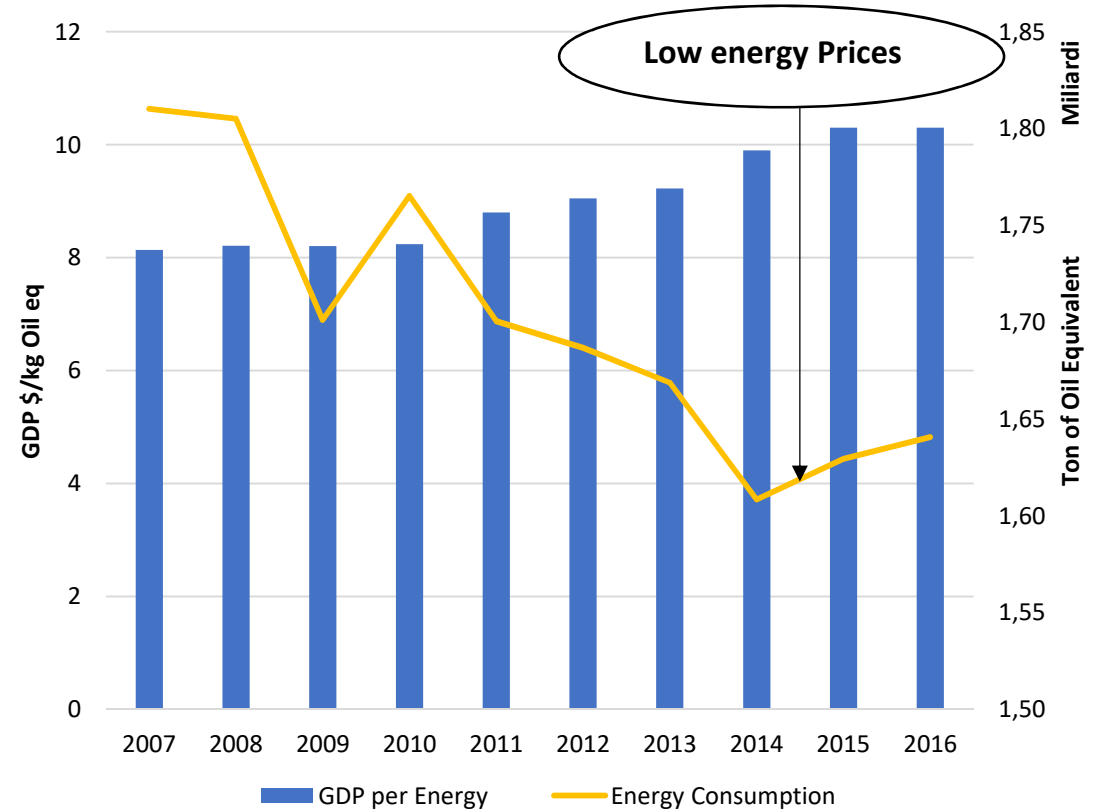
# Results



## GDP and Population



## GDP and Energy



# Conclusion



- Unlike the rest of the world, Energy consumption in EU countries is insignificantly impacted by GDP and population
- Other factors ( Regulations, Technologies & High Energy Prices ) are probably behind the decrease of energy consumption in EU .
- Low energy prices may change the EU model to match world consumption pattern similar to what happen in 2008 & 2015.

# Recommendations



- Low energy price will trigger demand → so EU should :
  - Explore more fossil fuel source to reduce the import dependency
  - Promote the renewable energy technologies.
  - Secure conventional energy (fossil fuel) supply from a reliable country.
  - avoid political tension especially with the key energy supplier.
  - Continue to improve the energy efficiency.
  - Impose optimum carbon tax strategy without impact the main human necessities.



Thank You

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