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2018

MCM/ICM

Summary Sheet

(Your team's summary should be included as the first page of your electronic submission.)

Type a summary of your results on this page. Do not include the name of your school, advisor, or team members on this page.

Overall the energy consumption for the states California (CA), Arizona (AZ), New Mexico (NM), and Texas (TX) increases over the time period from 1960 to 2009. We narrow down a list of 605 variables affecting the energy profiles of these states to 56 variables. We use two different methods to create models for the energy profiles.

We then calculate the renewable energy potential for each state by taking the renewable energy produced in 2009 and dividing it by the total energy consumed in 2009. The renewable energy potential of California is 7.93%, the renewable energy potential of Arizona is 6.09%, the energy efficiency of New Mexico is 5.04%, and the energy efficiency of Texas is 2.69%. The renewable energy total consumption, total energy consumption, renewable energy consumption, and total energy consumption increase over the time period.

Variables such as geography, industry, population, and climate affect the energy consumption and production of each state. The general climate of these states is arid and hot with some mountain and desert regions. The population of each of the states has increased exponentially from 1960 to 2009. Technological advancements in energy production such as in solar panels or windmills affects the renewable energy consumption and production. More industrialization also increases the consumption and production of energy. The state with the best energy profile appears to be California, with an efficiency of 7.93%.

We use two models to create a piecewise continuous function to better re-sample the data. This allows us to create a more representative time series, which we can then fit a time series process to. Finally, we can evaluate these processes to forecast how the data will look in the future. From these predictive values, we determine that California has the best future outlook as it relates to renewable energy production, as well as energy exported.