**Slide 1**

Our project focuses on the two types of renewable power generation sources for a data center: Solar and Wind. Upon analysis we have found that wind produces more energy compared to solar that is wind generates 89% power while solar generates remaining 19%. But since wind alone is not efficient, we have planned to focus on a reliable hybrid system using both the sources.

**Slide 2**

To run the hybrid system efficiently, we can run both the sources alternatively. For example, during daylight we can use the solar panels to generate power and keep the wind generators at rest and during the night we can use the wind to produce power. We can see that more power is generated during winter as there are not much clouds and more wind and sunlight can be collected. Upon checking the data over 4 years we have confirmed that using this system, power generation has increased over time.

**Slide 3**

This shows how we have developed our machine learning system. First we have collected data from all three energy production sources, then we have cleaned them and analyzed them with visualizations. Next, we have preprocessed them with the following data processing techniques and split the datasets into two sets: train set with 80% data and test set with the remaining 20%. Then we have used the training set to train the models and used the testing set to evaluate the models’ performance. After that, we have optimized the models using GridSearchCV algorithm and finally we have evaluated the optimized model with the test set again and finalized our best performing model.

**Slide 4**

These two are the confusion matrixes for the two best performing machine learning models, random forest and linear regression. This table shows all the algorithms we have used to train the hybrid dataset and the accuracies we have obtained. Random forest and linear regression both produced 90% accurate results followed by decision tree with 89%.