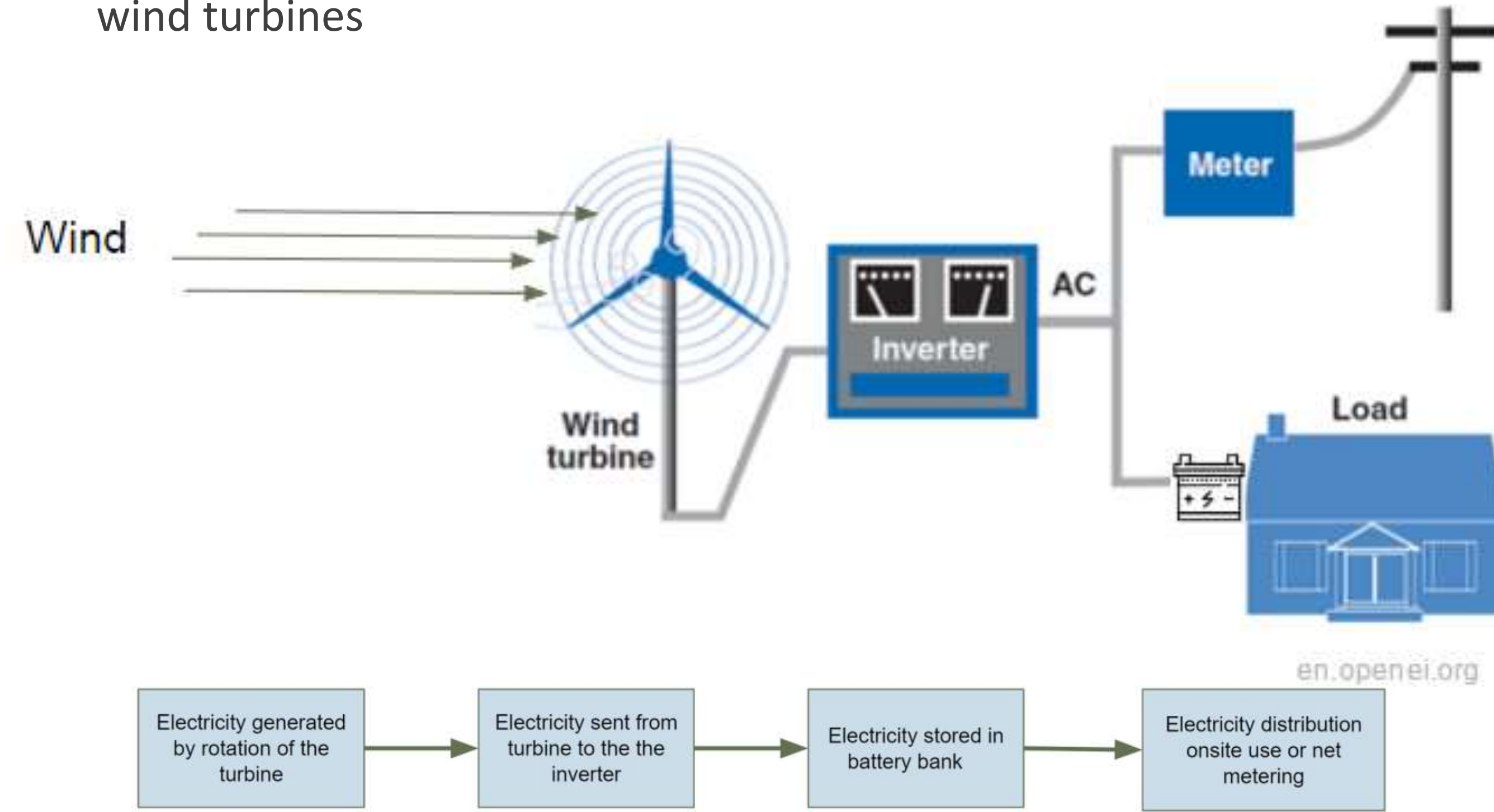


Context

- The average homeowner in Virginia pays **\$130** every month and this price continues to increase.
- Virginia homeowners pay 14% more than the national average.
- **The variance in monthly bills is about \$54, causing an uncertainty for homeowners.**
- This variance can be reduced by supplementing energy generated by wind turbines



Need Statement

- Residential electricity costs are continuously increasing.
- According to Energy Information Administration (EIA) prices will increase by 18% in the next 23 years.
- Current systems rely on general weather data which is inaccurate to a specific location
- Protect the environment by utilizing **alternate** renewable sources of energy to further reduce the carbon footprint.
- Take advantage of **microclimate fixed locations** with potential wind power and exploit **Venturi effect**, if present. Taking these factors into consideration, a set of best turbine configurations (based on cost & power output) will be recommended to homeowners in order to install at that specific location.

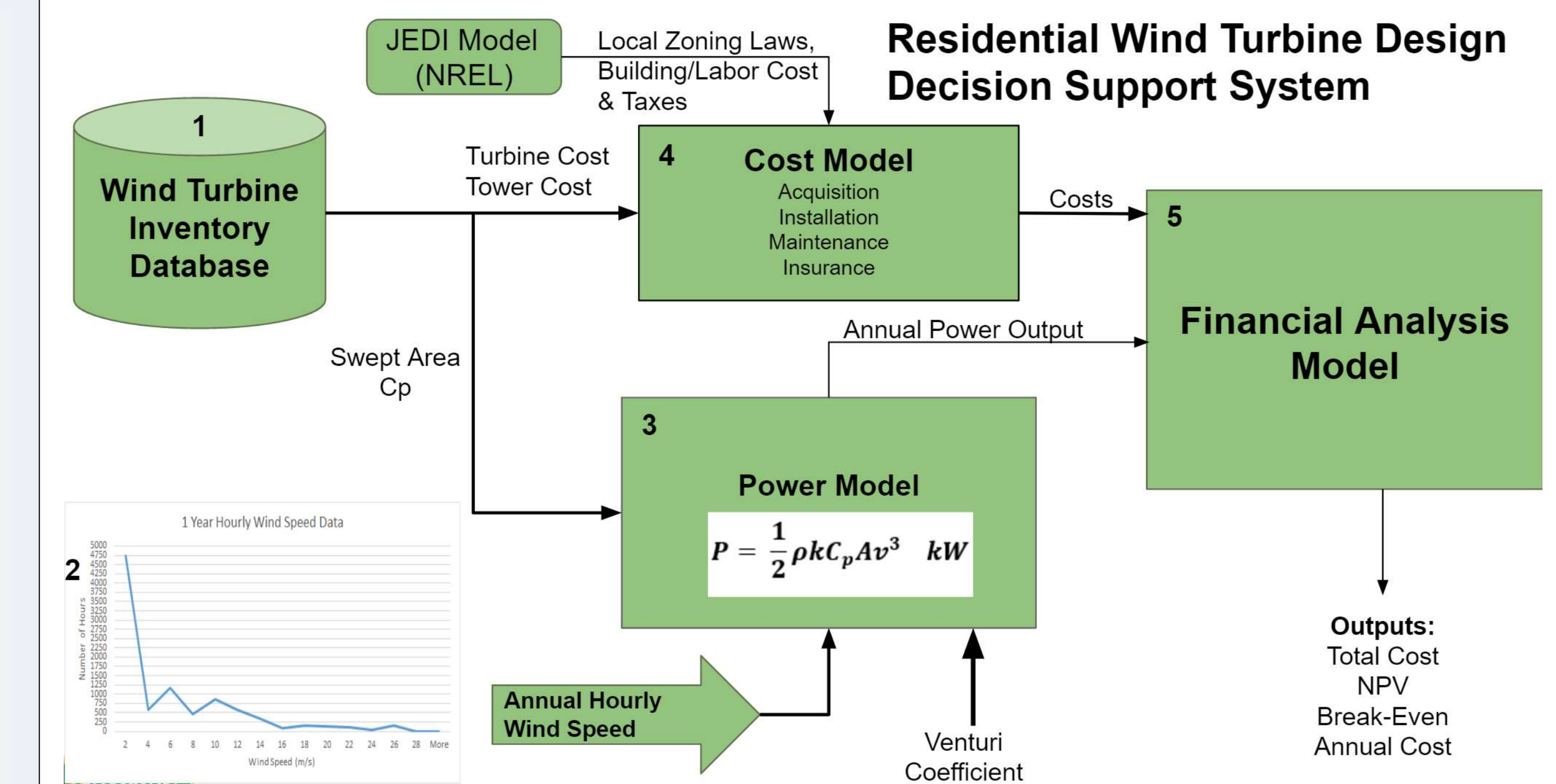
Method of Analysis

The DSS will:

- Use Microclimate data for specific locations
- Offer rooftop mounted solutions
- Take advantage of Venturi effect to increase power output

To:

1. Reduce variability of utility bills
2. Reduce utility bills
3. Generate clean energy

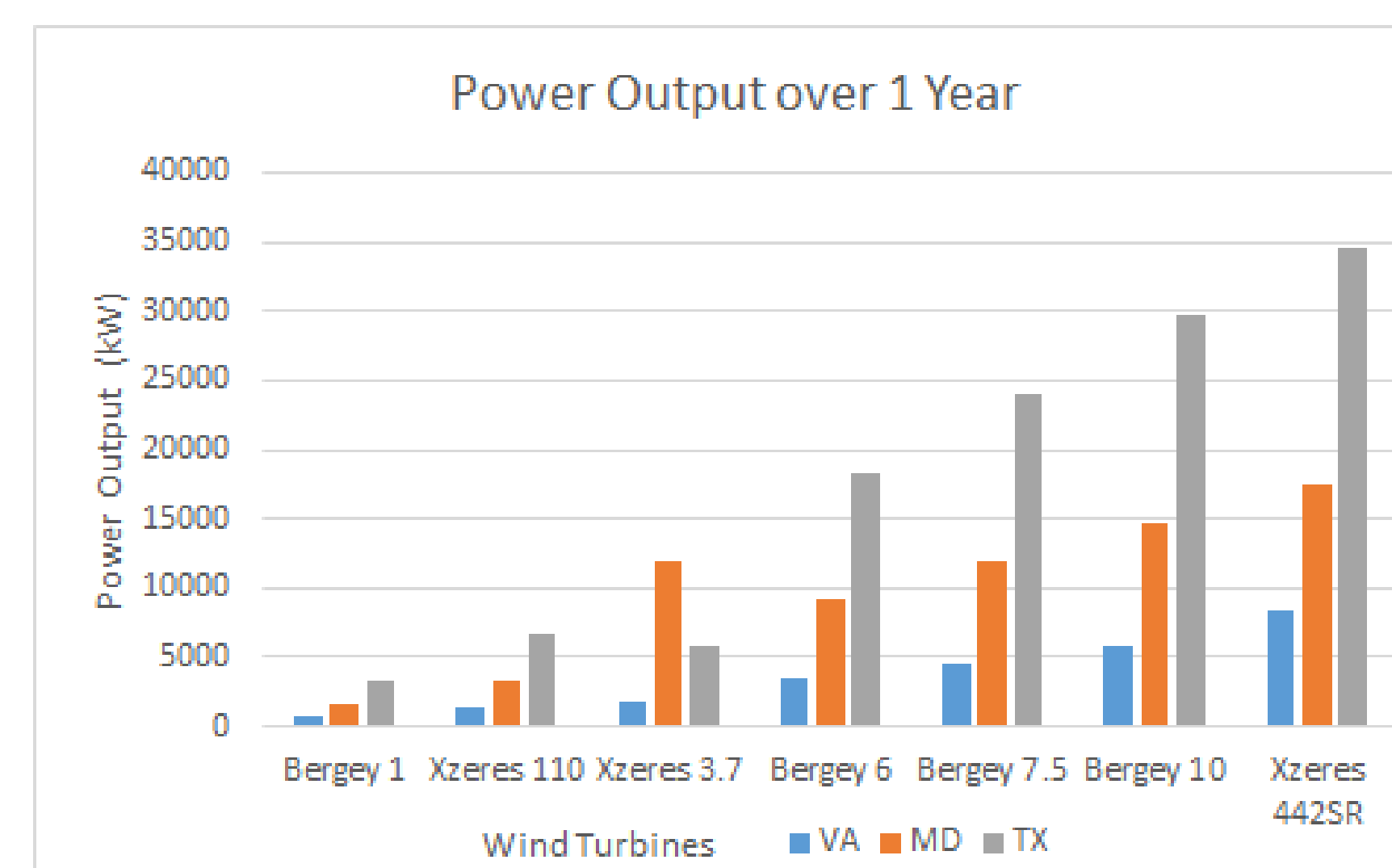


Results

Results

Conclusions & Recommendations

- 3 Case Studies Performed (Annapolis, Maryland Spotsylvania, Virginia Amarillo, Texas)
- Wind data collected from AWS True Power Merra 2 Nasa Satellite from January 1st, 2016 to December 31st, 2016



	Annapolis, Maryland	Spotsylvania, Virginia	Amarillo, Texas
Average Wind Speed	5.45 m/s	4.58 m/s	7.23 m/s
Percentage of Power Generation of 1 Year	32%	26%	90%

A direct impact can be seen through increasing the swept area and rated power

