Artificial Intelligence is changing the way energy is generated, delivered and consumed, helping to reduce the cost of energy while also reducing the consumption of fossil fuels. As technology has advanced the electric grid in the United States has not kept up pace. Artificial Intelligence helps these aging systems by utilizing technology in key parts of the infrastructure to optimize their usage, effectively creating a “smart grid”.

Newer “green” technologies are one-way energy companies are working to modernize the grid. A problem with renewable source of electricity is its inconsistency. Cloudy days windless afternoons can reduce generation and create power shortfalls [1]. The opposite scenario exists where these resources produce more energy than can be consumed. Artificial Intelligence is used to create forecasts for energy demand and also predict the ability of renewable energy sources to supply enough power to meet this demand. Accurately forecasting supply and demand allows fossil fuel burning power plants to fill gaps when not enough power is available from renewable resources and then taken off line when renewable resources are meeting the demand.

Another part of the smart grid is the smart meter. These meters provide two-way communication of energy usage into households. The communication occurs over the installed power lines using the advanced metering infrastructure (AMI) [2], helping to keep deployment costs down for energy companies. This allows a detailed level of information to be gathered by energy companies. Aside from the advantage of automated billing, energy companies can ascertain what types of appliances are being used such as air conditioners or refrigeration units and when they are being used. It provides data on what times of day they can expect high energy consumption. Artificial Intelligence can be used to predict consumption trends and provide customers incentives to use electricity during off-peak hours lowering demand on the grid during those peak hours.

Privacy concerns come along with this data gathering. Monitoring individual usage can give insight to when homes are occupied and what type of electronics people are using. These concerns need to be addressed as more smart meter data is gathered.

# Bibliography

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