

## Challenge Objective

For the **Maven Power Outage Challenge**, you'll be playing the role of a Senior Analytics Consultant hired by the U.S. Department of Energy (DOE). Here's your project brief:

Electricity outages are a growing concern as we enter an age of unprecedented energy demand and climate disasters.

We have event-level power outage data going back to 2002, but have struggled to make sense of it due to severe issues with the data quality and integrity.

This is where you come in.

We need you to **consolidate and clean up the raw data**, and **create a dashboard or report** to help us understand patterns and trends around outages, quantify their impact on our communities, and identify possible weak points in the grid.

### Task 1: Data Consolidation and Cleaning

- Gather and consolidate event-level power outage data from 2002 to the present.
- Address data quality and integrity issues, including missing values, inconsistencies, and errors.
- Develop a standardized data format for consistent analysis.

### Task 2: Data Analysis and Visualization

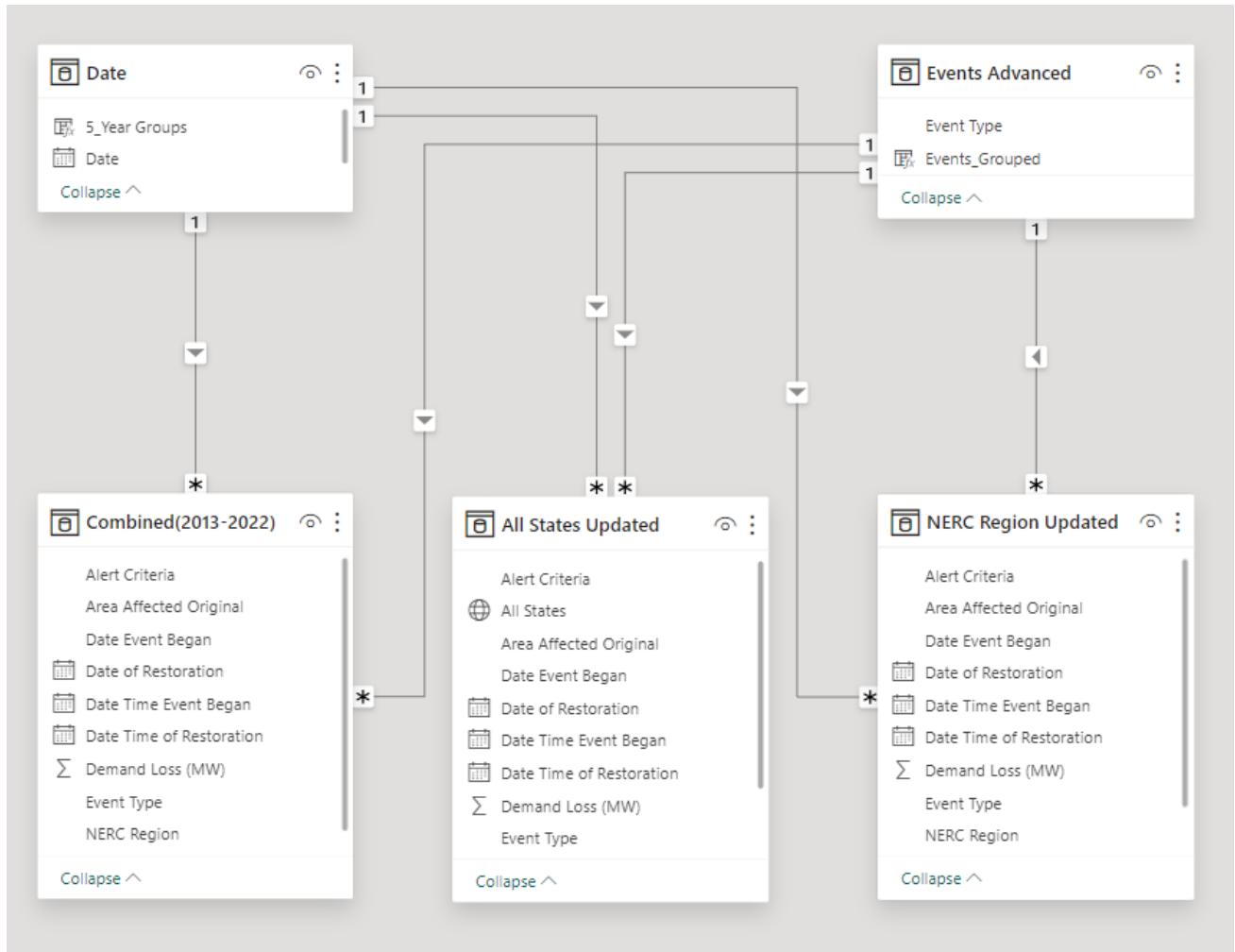
- Identify patterns and trends in power outage data, including frequency, duration, and geographic distribution.
- Analyze the impact of power outages on communities, considering economic, social, and environmental factors.
- Identify potential weak points in the grid infrastructure that contribute to power outages.

### Task 3: Dashboard or Report Creation

- Develop a comprehensive dashboard or report that effectively communicates the findings of the data analysis.

- Use clear and concise visualizations to present complex data insights.
- Provide actionable recommendations for improving grid resilience and reducing power outages.

### Data Modeling:



### Analysis and Insights:

This dashboard was built for Maven's Power Outage Challenge. Its primary purpose was to analyze the past 20 years of data and transform it into a clear and insightful report. This report will help diagnose and understand the causes of power outages

Being an emerging data analytics explorer, I found the variety of table formats across the 20-year data set quite challenging to clean, python helped though. However, I gained valuable insights into modeling thanks to the winning dashboard, especially for handling the "states" column. Now, let's dive into the insights I uncovered using DAX and exploring

key performance indicators (KPIs). Due to time constraints, I focused on the last 10 years for trend analysis and recent developments. At the top, I highlighted the main KPIs, including the top event causes by date hierarchy and average customers affected.

Some of the key findings from the analysis include:

- Over the last decade, a total of 2,480 events were reported.
- On average, each event impacted approximately 58,830 customers.
- The analysis revealed an average power loss of 283.39 MW observed in the last decade.
- Weather or Natural Disasters accounted for 33.44% of the events, making it the leading cause, followed by Operation Malfunction/Failure.
- The top five states with the highest MW loss per state are California, Nevada, Texas, South Carolina, and North Carolina.
- The WECC NERC region experienced the highest number of events.