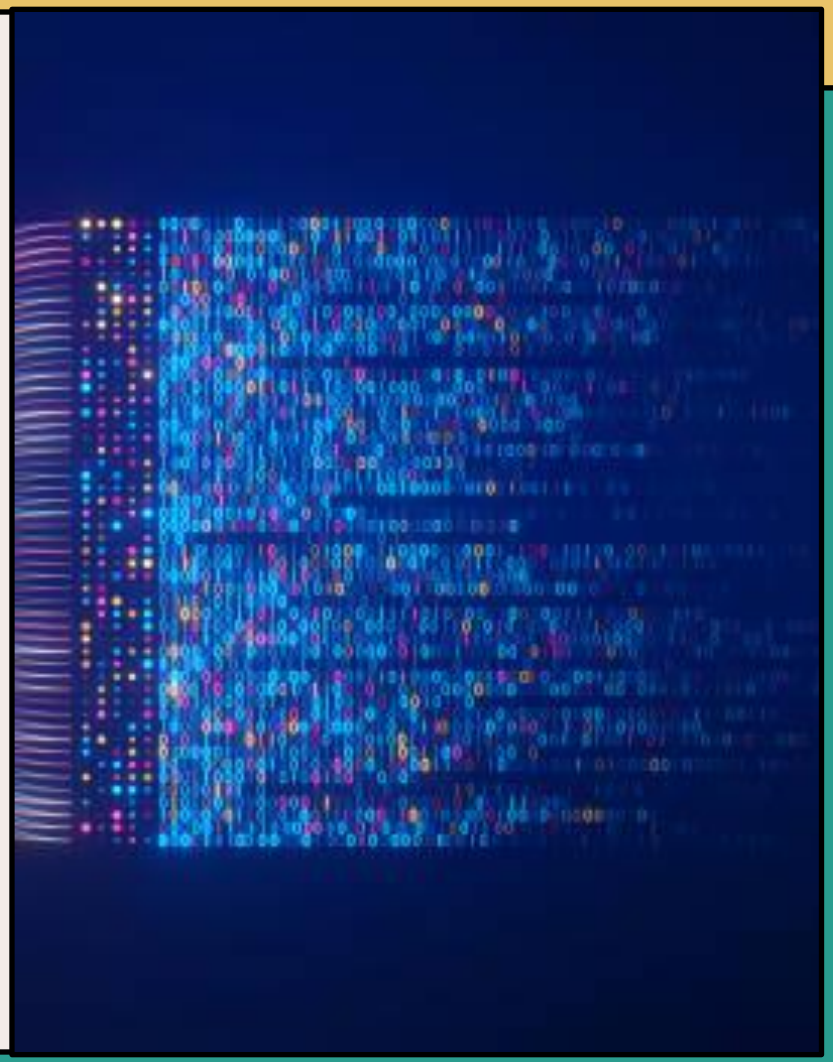
HTC's Data Analytics Case Competition

Sameer Kamran, Abrar Rehan, Muzammil Saleem,
Noor Syed, Shreya Shah

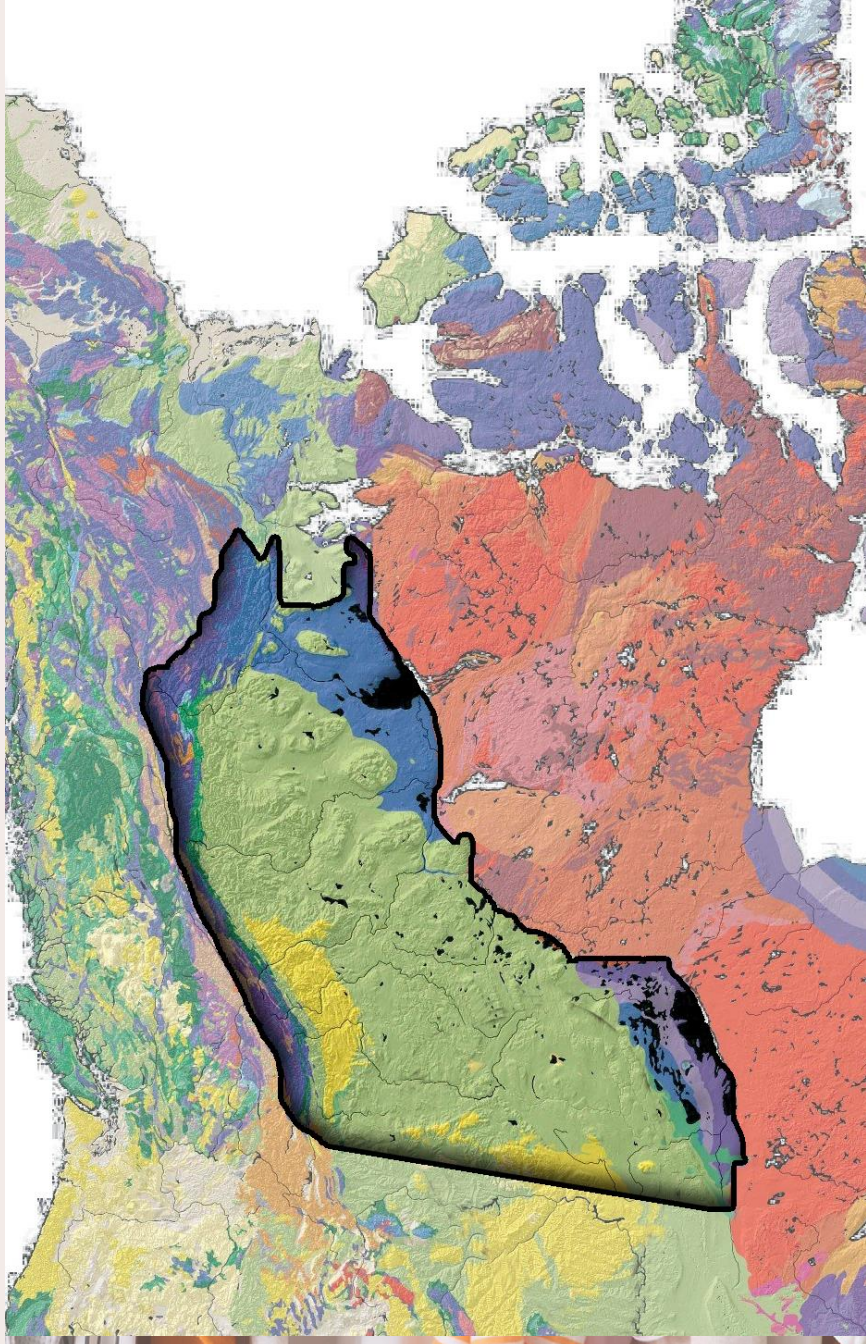


Agenda

1. Problem Statement
2. Introduction
3. Our Solution: Keyera Flow
4. Emissions Analytics
5. Conclusion

Problem Statement

- **Keyera's Expanding Role**: Storing, processing, and marketing natural gas & NGLs with a focus on innovation & sustainability.
- **Western Canadian Sedimentary Basin**:
  - 600+ active gas plants generating vast amounts of critical data.
  - A high-growth region for the energy sector.
- **Current Challenge**:
  - Data is readily available but manual, time-consuming, and inefficient to analyze.
  - Slows down decision-making and operational optimization.
- **The Need**:
  - A faster, more dynamic way to analyze and act on this information.
  - A centralized system for storing, managing, and analyzing data to drive informed decisions.



Our Goal

- **Goal**: Develop an AWS QuickSight dashboard to help Keyera store, access, and analyze critical data efficiently.
- **Impact**: Saves time, resources, and increases efficiency, aligning with Keyera's five core values.
- **Core Dashboard Features**:
  - Key operational metrics for data-driven decision-making.
  - User-friendly navigation for seamless data access.
- **Beyond the Requirements**:
  - Conducted sustainability & environmental impact analytics.
  - Identified areas for process improvement to enhance efficiency.
  - Because without sustainability, there isn't a future to innovate.

Our Solution: Keyera Flow

Made of two dashboards

Dashboard 1

- Provides insight regarding the various gasses produced at each gas plant and compares them
  - Throughput
  - Nameplate Capacity
  - Utilization Rate
  - NGL Component Yields:
  - Last Month's Throughputs:
- Includes an interactive map that enables the user to lookup facts about a specific gas plant and compare its statistics with others.

Dashboard 2

- Dives into the sustainability of each gas plant
- Analyzes greenhouse gas emissions
- Summarizes critical emissions metrics:
  - CO_2 Emissions
  - CH_4 Emissions
  - Total Emissions
  - Flaring Index
  - Methane Leakage Rate

Dashboard 1

Our Solution: Keyera Flow

Dashboard 1 - Key Features

Name Plate Capacity:

- Donut Graph displaying the License Capacity .of Raw Gas for different plants
- Cochrane Straddle and Empress Straddle Plants are the two plants with the greatest capacity

Utilization Rate:

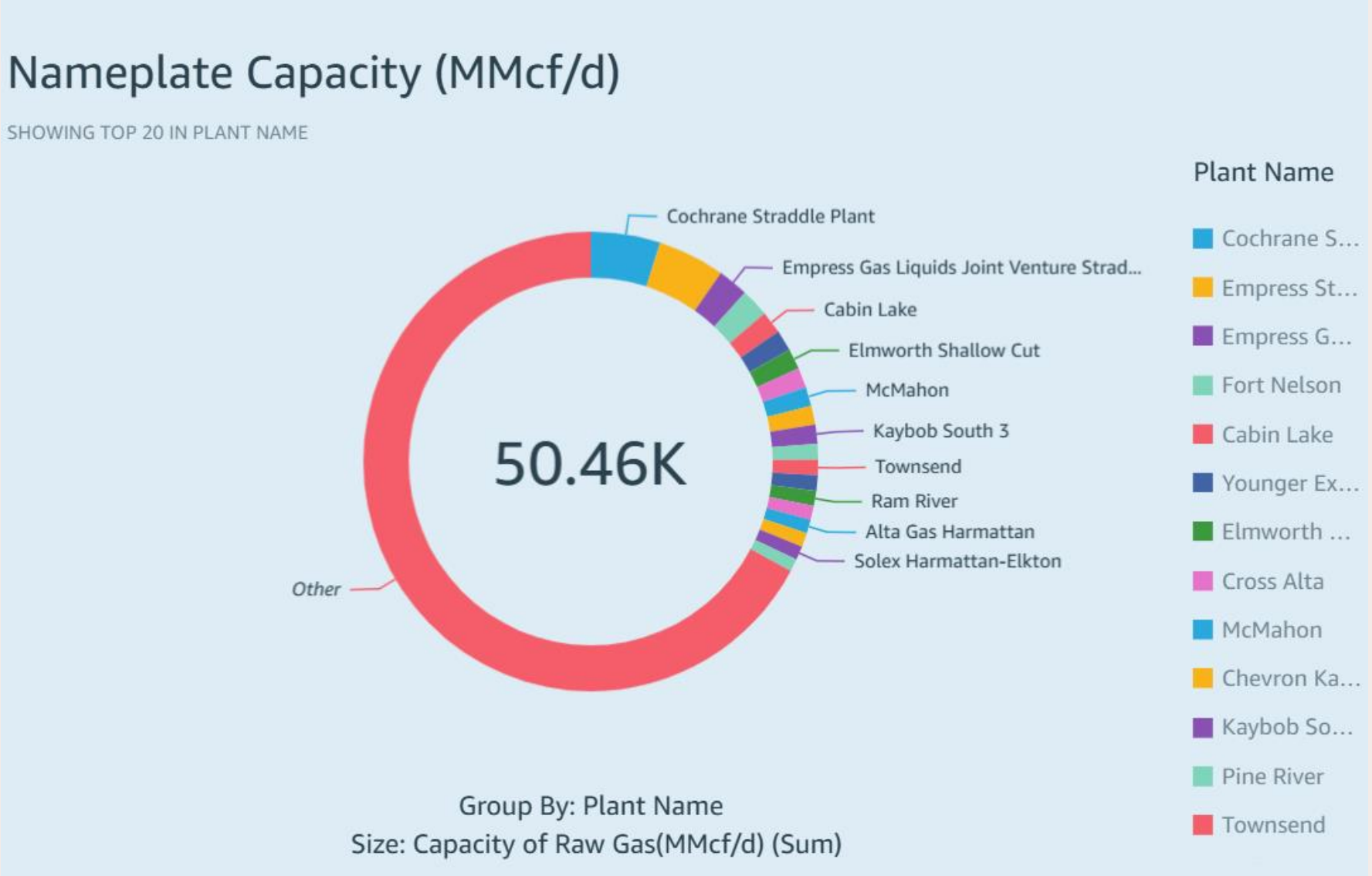
- Computed using the throughput gas and license capacities for different plants
- The lower rates indicate that the license capacity of the plant is not being utilized to its full potential.
- May highlight regions for improvements

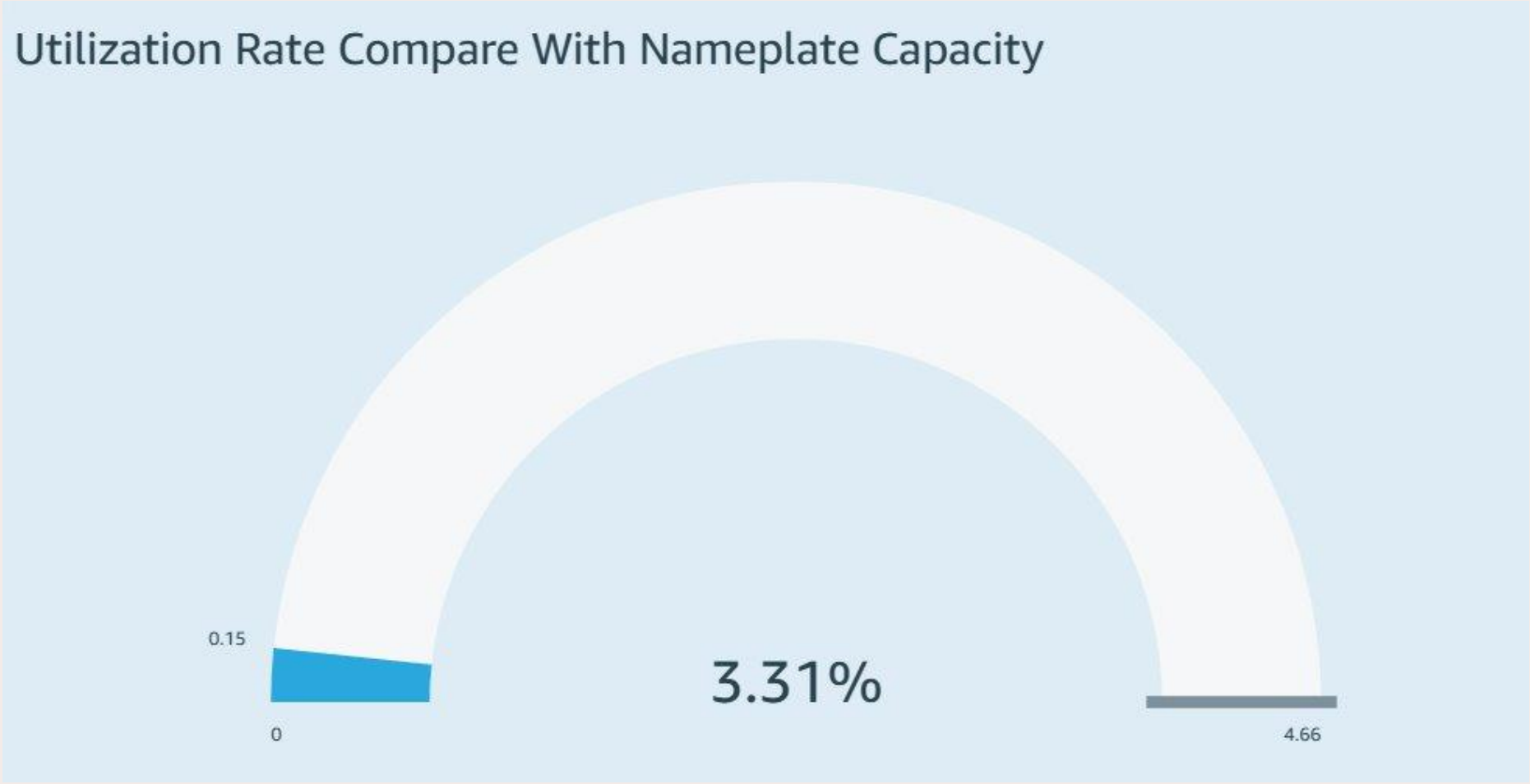
Map and Queries:

- A geographical map that is interactive and different filters to produce query specific results.

Highest Nameplate Capacity

Cochrane Straddle Plant




Utilization Rate Compare With Nameplate Capacity
0.15
0
3.31%
4.66

Our Solution: Keyera Flow

Dashboard 1 - Key Features

Last Month's Throughputs:

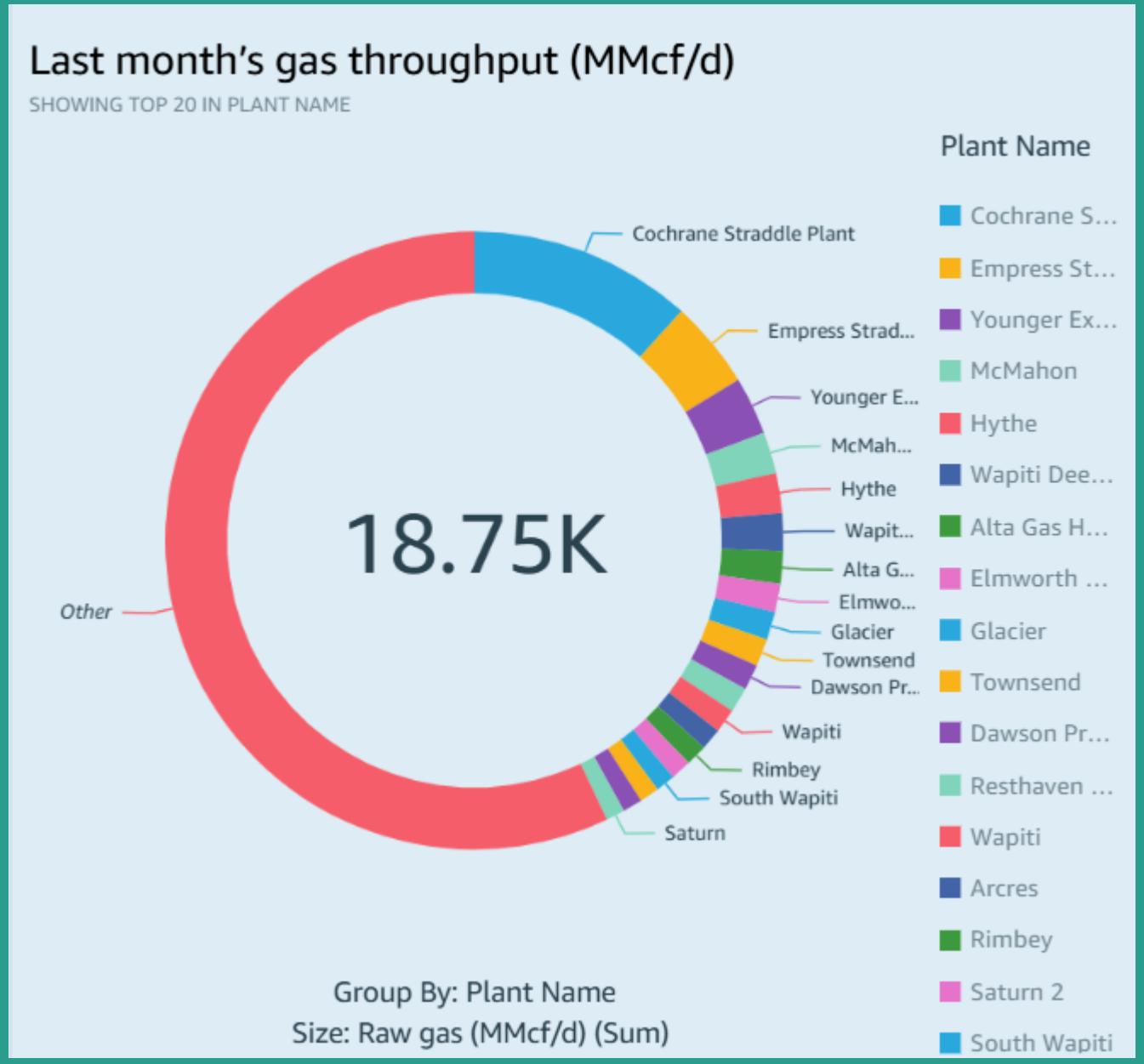
- Pie Chart displaying the processed gas transported from the different plant facilities.
- Along with the utilization rate, can be used to identify areas that are not being used to their full potential.

NGL Component Yields:

- Four pie charts displaying the different liquid yields for 4 NGL components that are transported to users.
- Identifies the plants with highest output, indicating regions where capacity may want to be expanded to take adavntage of this.

Total Liquid Component Yields:

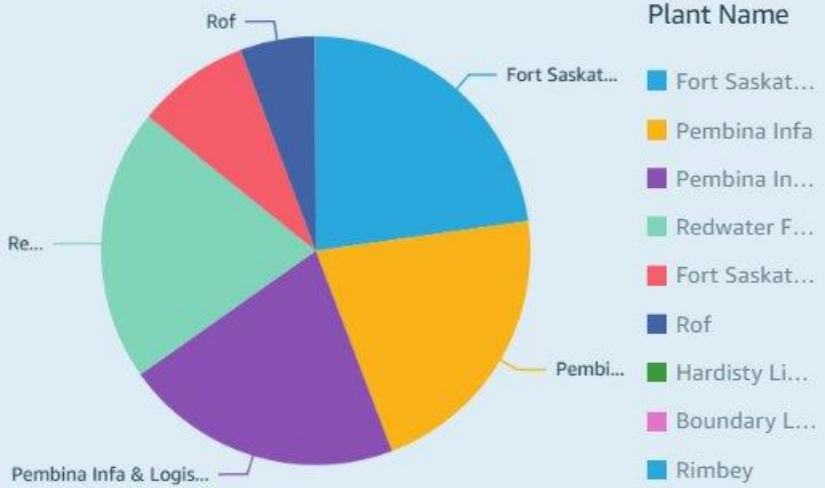
- The sum of NGL liquid compnents produced by each plant. Along with individual component yields, can identify plants that may not be used to their full potential.



Last Month's Throughput

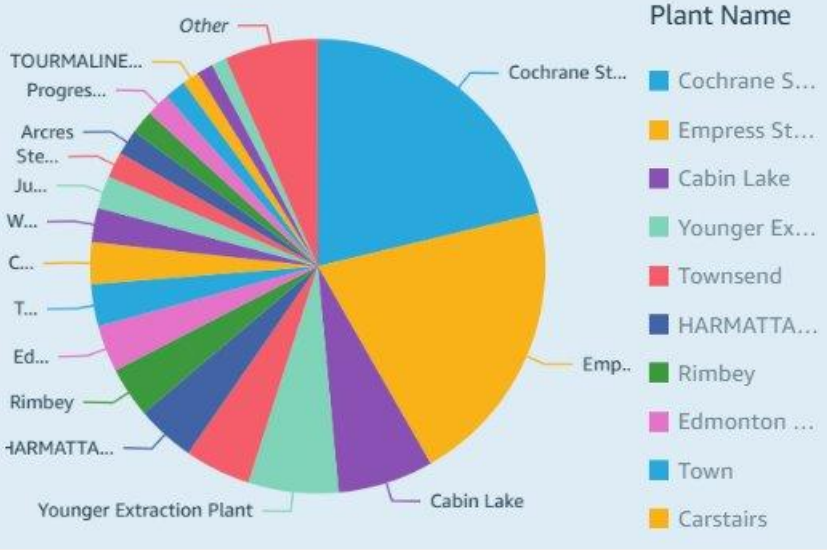
Butane Liquid Yield by Product

SHOWING TOP 20 IN PLANT NAME



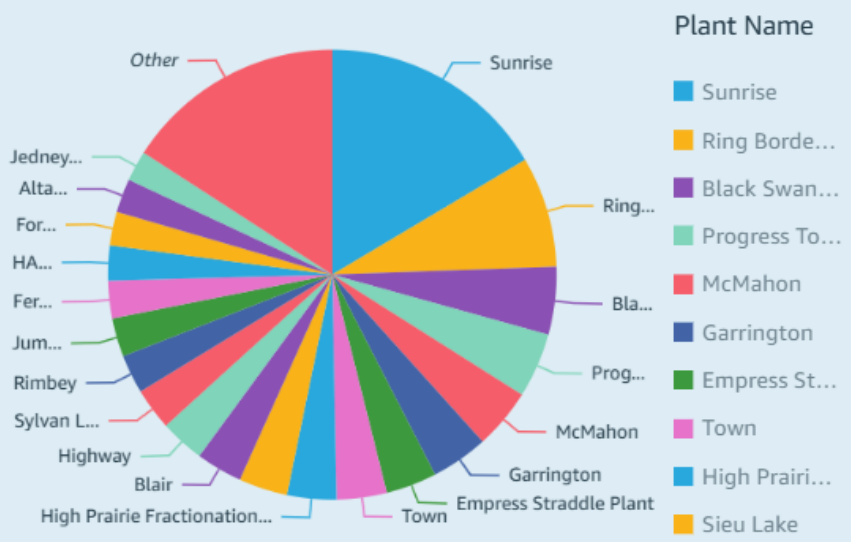
Ethane Liquid Yield by Product

SHOWING TOP 20 IN PLANT NAME



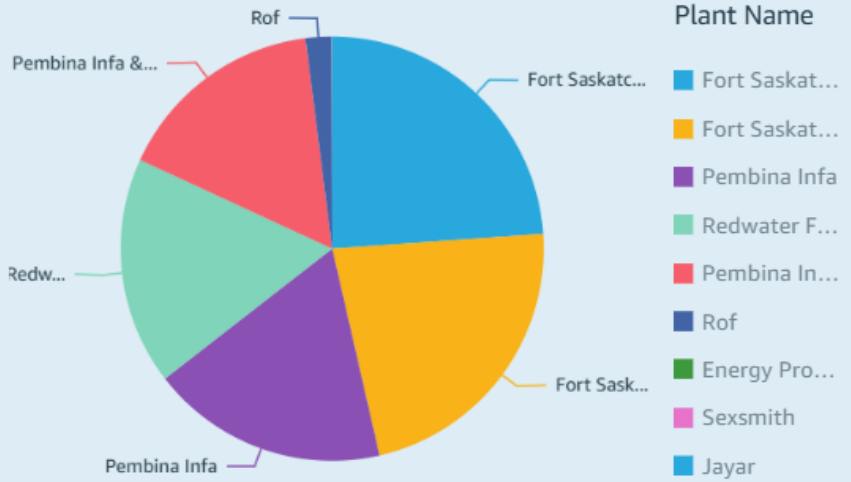
Propane Liquid Yield by Product

SHOWING TOP 20 IN PLANT NAME



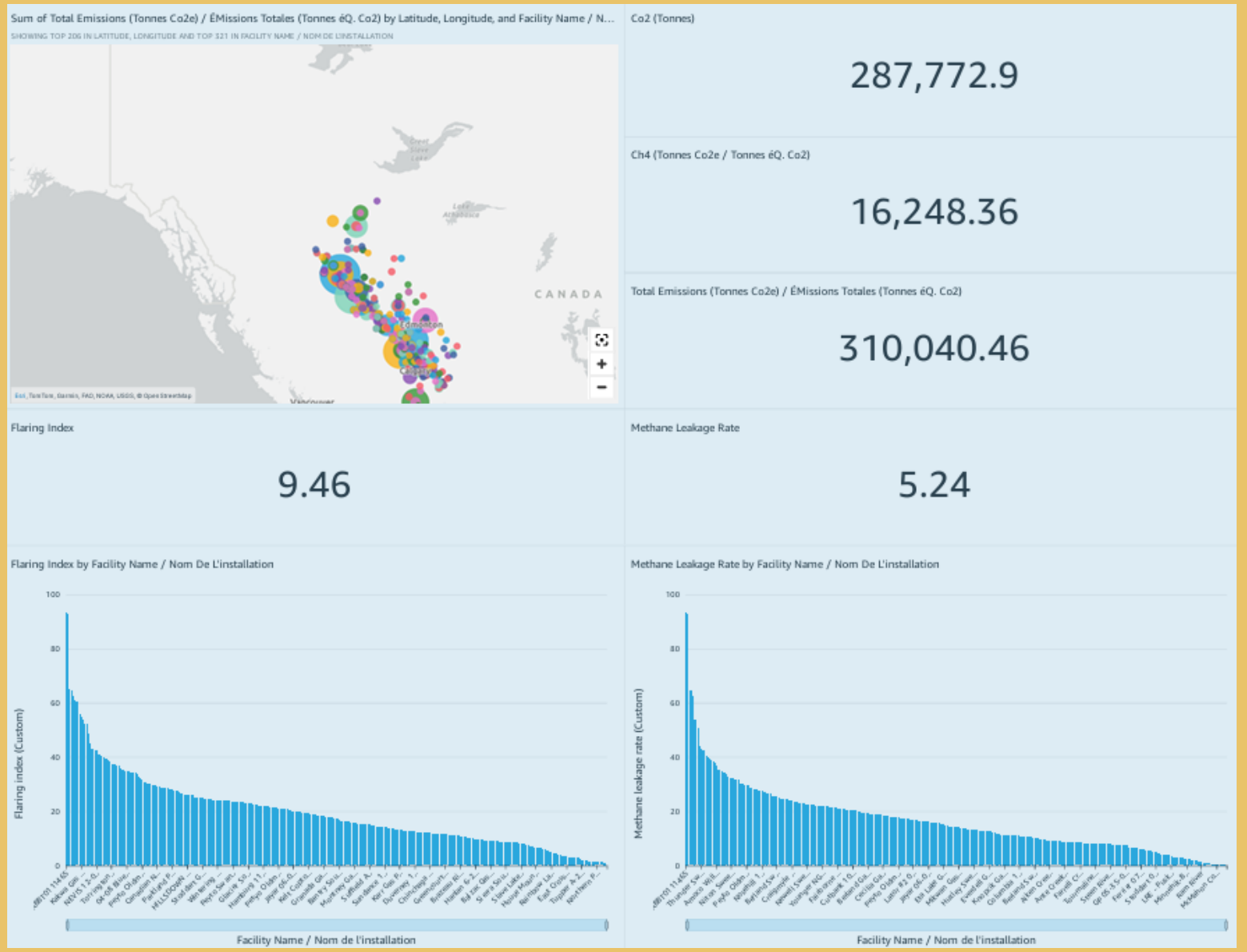
Pentane Liquid Yield by Product

SHOWING TOP 20 IN PLANT NAME



Dashboard 2

Greenhouse Gas Emissions Dashboard

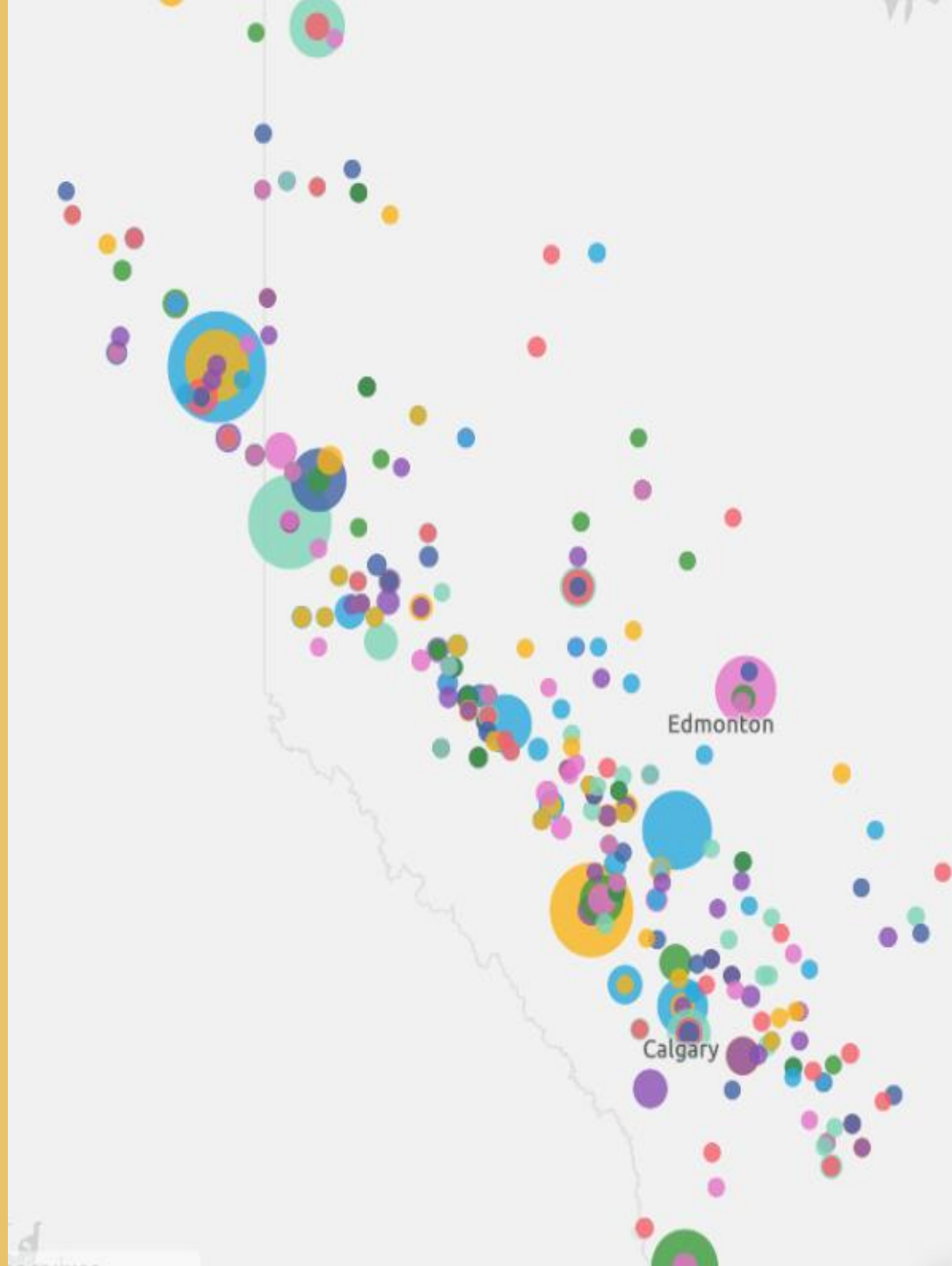


Greenhouse Emissions Monitoring

This dashboard provides an in-depth analysis of greenhouse gas emissions across multiple facilities in the oil and gas sector. It allows us to identify high-emission sites, analyze methane leakage and flaring inefficiencies, and compare emissions intensity across different locations.

Components :

- Geographic Emissions Overview (Map)
- Key Performance Indicators (KPIs)
- Flaring Inefficiency Analysis
- Methane Leakage Rate Analysis
- Emissions Breakdown by Facility



Our Solution: Keyera Flow

Dashboard 2 - Key Features

Geographic Emissions Overview :

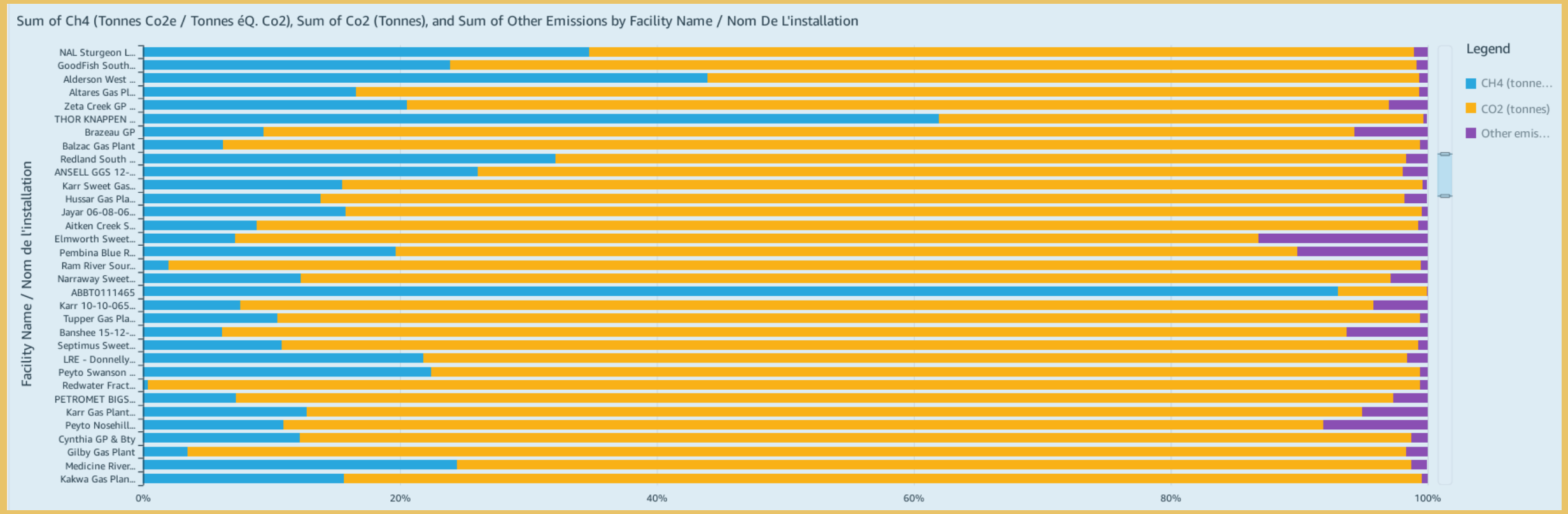
- A geospatial bubble map displaying total greenhouse gas (GHG) emissions (CO_2e) by facility location.
- Bubble size represents total emissions, and colors differentiate companies or facility types.
- Clicking on a facility dynamically filters the entire dashboard, updating other charts to focus on that specific site.
- Helps pinpoint emission hotspots and facilities that may require intervention for emission reduction strategies.

Key Performance Indicators:

- Five large KPI tiles summarizing critical emissions metrics: CO_2 Emissions, CH_4 Emissions, Total Emissions, Flaring Index & Methane Leakage Rate
- Provides an at-a-glance summary of emissions trends across all facilities

Emissions Breakdown By Facility

- A stacked bar chart displaying emissions composition per facility, segmented by gas type.
- Provides a detailed emissions profile for each facility, helping identify key areas for reduction efforts.



Our Solution: Keyera Flow

Dashboard 2 - Key Features

Flaring Inefficiency Analysis

- A ranked bar chart displaying the Flaring Index for each facility.
- Helps identify plants with poor gas combustion efficiency, enabling targeted solutions like flare gas recovery systems.

Methane Leakage Rate Analysis

- A ranked bar chart showing methane leakage rates across facilities.
- Enables early detection of pipeline leaks, reducing both emissions and financial losses.

Thank You for Your Time!

Github link: https://github.com/muzman123/htc_case_comp