Discovering the Energy diversity and usage trends

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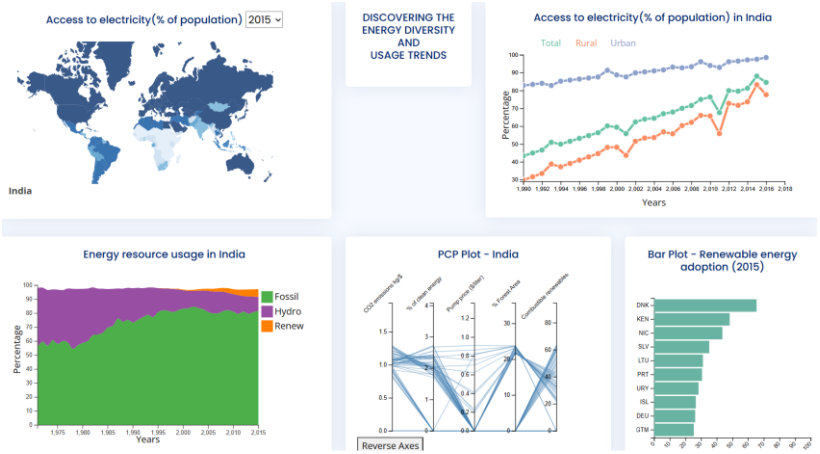
Introduction and Goals:

Investigate how the world is progressing toward the management of natural resources and analyze the factors impacting the adoption of renewable energy sources, the % utilization of each resource, etc.
Here, the trends of various countries over a span of 50 years are compared.

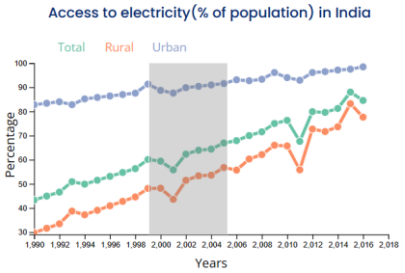
Methodology:

1. There are a total of 1500 parameters in the dataset and I have chosen the most relevant ones related to the problem statement. For each parameter, we have the data from 1960-2018 for all the countries.
2. Data cleaning: As there are a lot of missing values, they have been imputed with the mean value.
3. As the number of parameters are huge, I used MDS to understand the correlation between the parameters and this helped in deciding a good ordering for the PCP plot.
4. The PCP plot is highly interactive, where the user can change the order of the axes dynamically and visualize the results instantly. This plot helps us to understand the correlation between parameters such as “Co2 emission”, “% forest area”, etc. and to identify the relationships.
5. The line plot comes with brushing feature which enables us to monitor the changes over time clearly.
6. The Geomap controls which country’s data is being displayed on the dashboard.

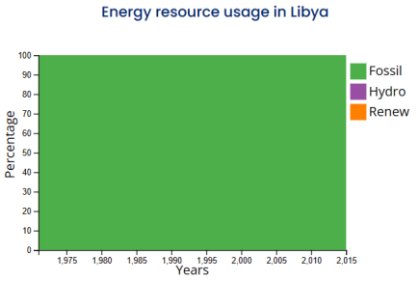
Dashboard Snapshots:



The Geomap is used to provide an overall idea of what % of population have access to electricity in the selected year.

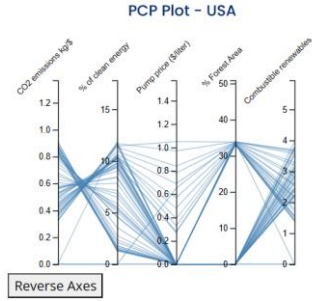


Based on the country selected in the Geomap, the line chart further shows how the accessibility of electricity is within rural and urban populations.



The PCP plot finds correlations between the parameters selected, and helps in finding relationships. This plot is highly interactive for reordering axes.

Based on the country selected in the Geomap, the areachart shows what energy resources are used and how they have evolved overtime to renewable resources.



Insights:

1. From the Geomap, we find that mostly African countries have less than 50% population having access to electricity, whereas countries like USA and Russia have already achieved 100%
2. From the Lineplots for Libya, we can see that the access to electricity has come down over time, more drastically for Rural areas. This is because it’s completely relying on fossil fuels (from area chart), which are on the brink of extinction.
3. From the barplot, we can see that as time is progressing more and more countries are adopting renewable energy resources, owing to the population growth and depletion of natural resoures.
4. From the PCP plot, we can observe that as we are relying more on clean energy sources, the CO2 emission is coming down.