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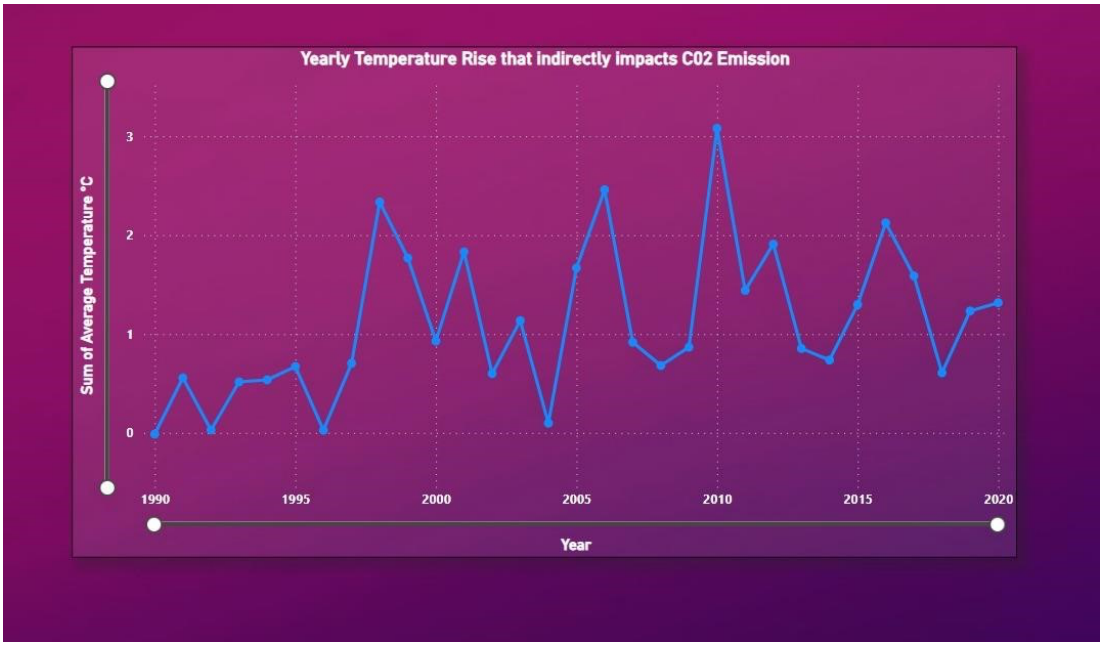
Visualization 1: Average temperature rise and CO2 emissions.

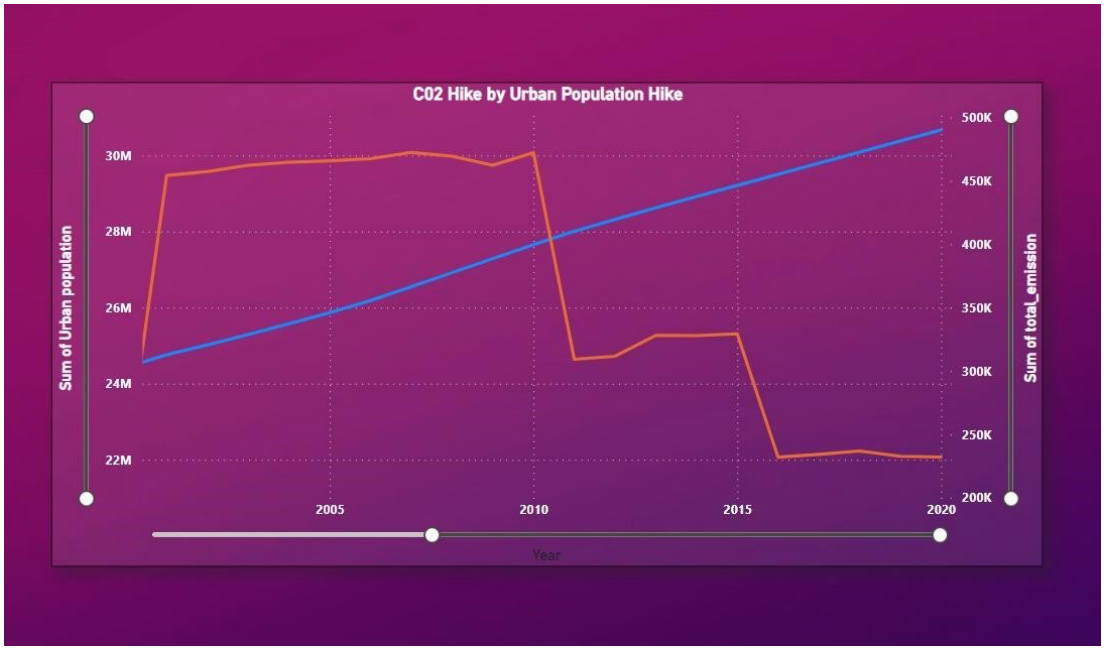


Since 1990, human activities like burning fossil fuels have been the main cause of the temperature's steady rise. An important worry is the complicated indirect effects of this warming trend on CO2 emissions. Increased evaporation, altered plant development, accelerated organic matter breakdown, more frequent and intense wildfires, thawing permafrost, and acidification of the ocean are all caused by warmer temperatures. Although there are many variables at play in the relationship between rising temperatures and CO2 emissions, scientists generally agree that warming brought on by human activity is a significant contributor to high CO2 levels.

Visualization 2: CO2 emissions from food over time

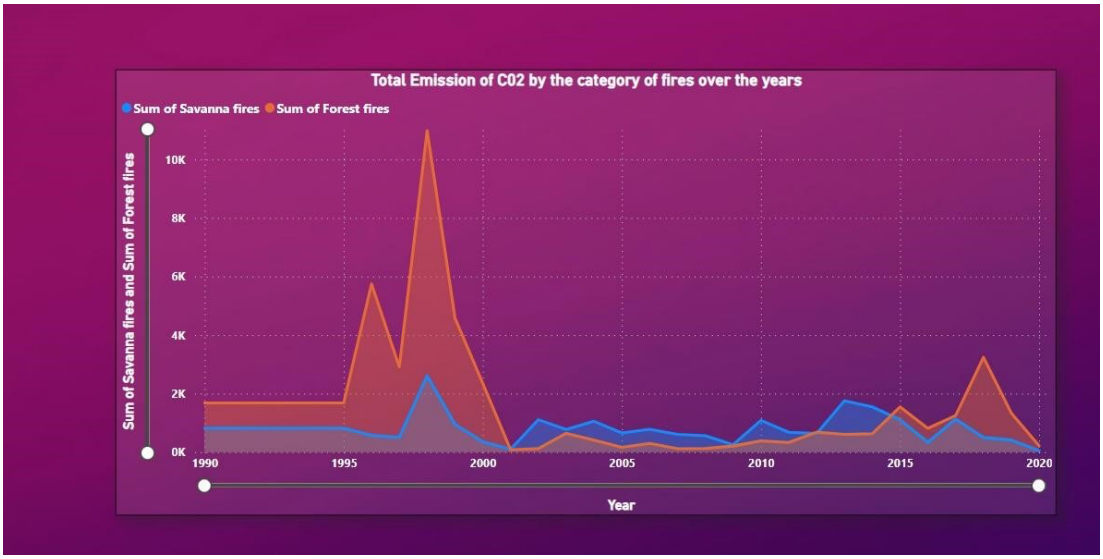
The graph from 1990 to 2010 displays the total CO2 emissions by food group. The food processing, packaging, and retail sectors have lowest emissions. The emissions from household food consumption are lower than the food transport. Apart from household food consumption, all the rest categories have showed a rise in emissions. Eat less meat, choose seasonal and local foods, support sustainable agriculture, minimize food waste, and use less packaging—all these actions will help cut down on emissions.

Visualization 3: Urban population growth and CO2 emissions



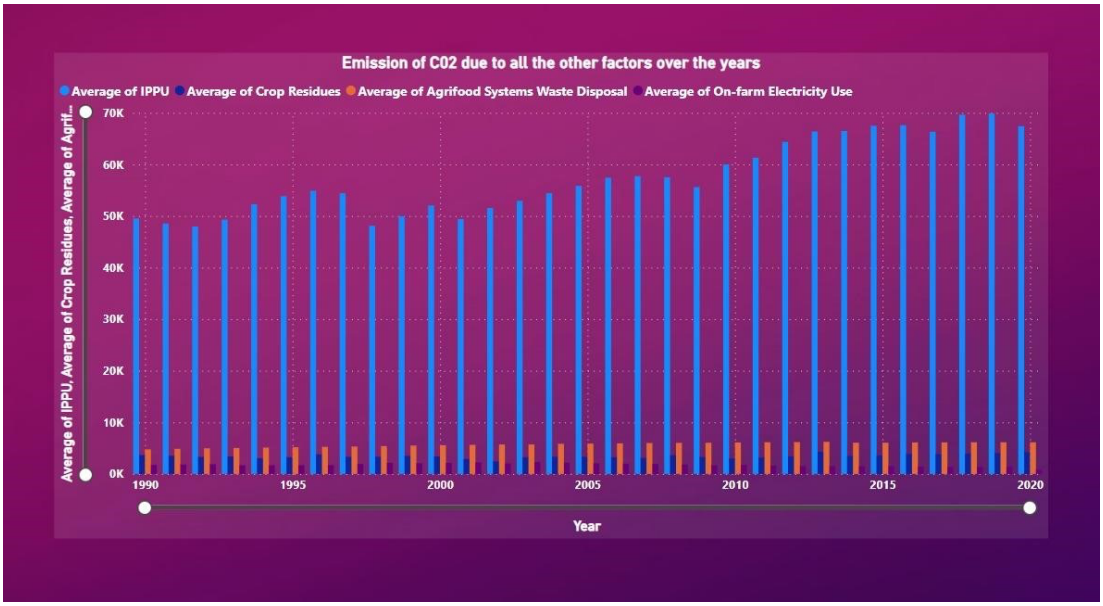
While the population of cities has been continuously increasing, CO2 emissions have grown at a faster rate. Urban regions' energy-intensive lifestyles, increased consumption, the transition from a manufacturing to a service-based economy, and the expansion of suburbs are the causes of this. We may enhance building energy efficiency, encourage walkability and bicycling, invest in public transportation, and support renewable energy sources in order to lower CO2 emissions.

Visualization 4: CO2 emissions from fire over time

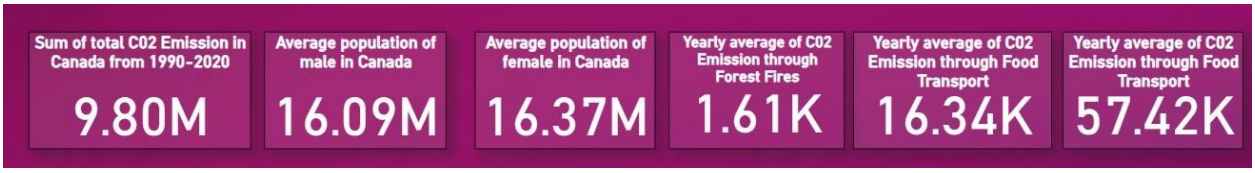


According to the graph, savanna and forest fires are the next biggest sources of CO2 emissions from fires category. Over time, emissions from all two types of fires have increased, with forest fires showing the greatest rate of rise in between 1995 to 2000. Because of the massive amounts of CO2 that are released into the atmosphere during the decomposition of organic matter, forest fires are especially dangerous. Reducing deforestation, managing forests sustainably, lowering greenhouse gas emissions, and restoring peatlands are all necessary to lower fire emissions.

Visualization 5: CO2 emissions due to all other factors over time



The CO2 emissions are decreasing slightly, but crop residue emissions are increasing. IPPU is the largest source of emissions, followed by agri-food systems waste disposal, crop residues and on farm electricity use. The Canadian government is committed to reducing emissions by 40-45% below 2005 levels by 2020 by investing in clean energy, improving energy efficiency, and reducing greenhouse gas emissions from agriculture and industry.



Kilotons (kt) are used to measure CO2; one kt is equivalent to 1000 kg of CO2.

How the visualizations aid in solving the issue or achieving the project's goals?

The five distinct graphics that illustrate the causes and effects of carbon dioxide emissions. These visual aids can be used to track the advancement of climate change objectives, involve stakeholders, draw attention to the issue of climate change, pinpoint important areas for reductions, and discover new directions for study and innovation. All things considered, the data these visualizations provide can be utilized to create and carry out plans to lower CO2 emissions and slow down global warming. The sources and effects of CO2 emissions are examined in detail through the analysis of five different visual representations presented in this educational article. These graphics offer a multitude of data on the causes and consequences of greenhouse gases, making them an invaluable resource for learning more about the subject of climate change. The visualizations can be used to track progress toward climate change targets, interact with important stakeholders, pinpoint areas that require immediate emission reductions, and pinpoint areas that could benefit from additional study and development.

A more sophisticated comprehension of the intricate matter of climate change can be attained by scrutinizing the insights furnished by these visual aids. Examples of these kinds of visualizations include ones that highlight the concentration of emissions in particular areas and those that illustrate how emissions affect global temperatures or sea levels. We can create focused plans to cut emissions in the most significant regions with the help of this information.

In general, these visual aids provide a potent means of addressing the pressing problem of climate change. We can take decisive action to build a future for our world that is more sustainable by utilizing the insights they offer.

Give particular examples of how your target customer could use these operationally, or on a daily basis?

Farmers and agricultural planners can use daily temperature trend visualizations correlated with CO2 emissions to make informed decisions. If there's a sudden temperature spike, they can adjust planting schedules or irrigation practices for optimal resource use.

Food producers and supply chain managers can employ this visualization to track daily emissions for various food categories. If a particular category experiences a sudden increase in emissions, it prompts a review of production processes or transportation methods for immediate adjustments, minimizing the environmental impact of food production.

It Includes insights into emissions from different factors allowing **businesses** to identify areas for efficiency improvements.

Provides trend analyses to support long-term strategic planning for sustainability initiatives

Include data on CO2 emissions due to fires, helping **governments** implement preventive measures and emergency response strategies.

Offer a comprehensive understanding of the carbon footprint within the agri-food industry, facilitating the formulation of policies that encourage and reward sustainable practices.

What are your dashboard's dynamic components and how will they benefit your intended customer?

Real-Time Weather and CO2 Data:

Farmers can make quick decisions based on current weather conditions, optimizing crop management and resource utilization for greater efficiency.

User-friendly interactive graphs showing CO2 emissions from different food categories over time.

Agricultural businesses may analyze trends in real-time, identify high-impact categories, and adapt production plans to achieve sustainability targets.

Real-time tracking of urban population growth and its correlation with CO2 emissions.

This dynamic data can be used by governments to develop timely policies addressing the environmental impact of urbanization and supporting sustainable practices.

Live data on CO2 emissions from factors beyond the main categories (e.g., transportation, energy usage).

Businesses may identify and address immediate energy and transportation efficiency possibilities, lowering their overall carbon footprint.