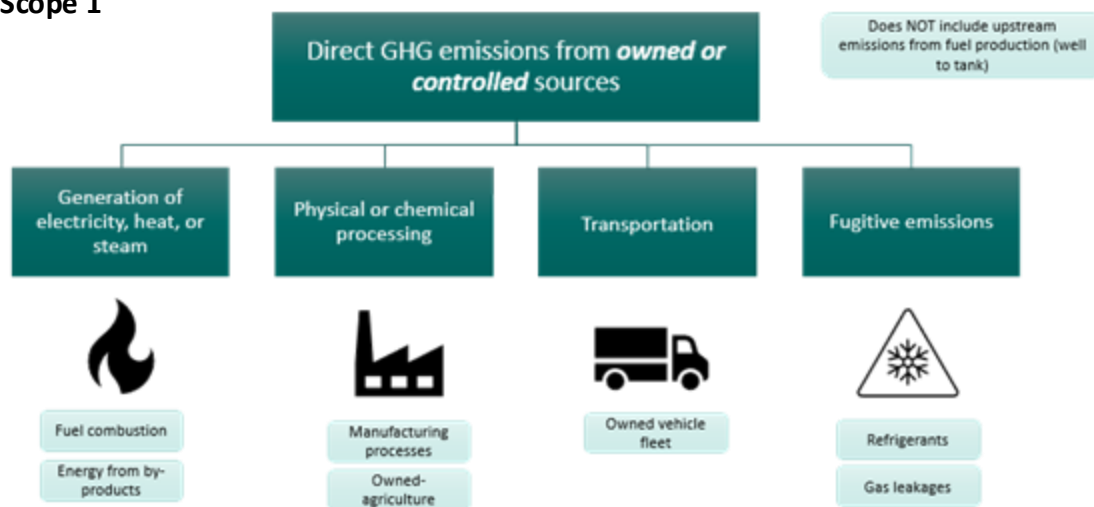


## Scope 1, 2, and 3 in GHG accounting

The terms "Scope 1, 2, and 3" were first introduced in the early 2000s as part of the Greenhouse Gas Protocol (GHG Protocol). The GHG Protocol was developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) to provide a standardized framework for measuring and managing greenhouse gas emissions. The terms "Scope 1," "Scope 2," and "Scope 3" were coined to define different categories of emissions. This terminology has been widely adopted across many standards and regulations since then.

### Scope 1

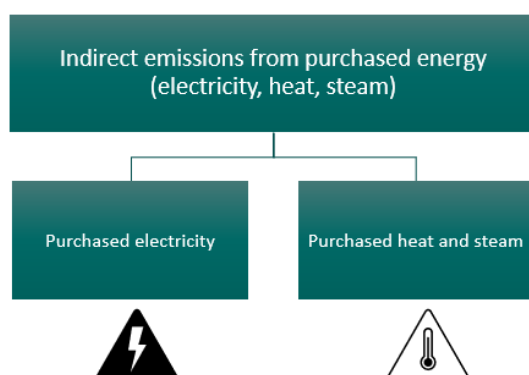


Scope 1 refers to direct emissions produced from sources that are owned or controlled by an organization. Common examples that we handle in Manufacture 2030 include:

- **Combustion of Fossil Fuels:** Emissions from burning fossil fuels for heating, such as natural gas in boilers or furnaces, and for operating vehicles and equipment owned by the organization. Note that this does not include any upstream emissions associated with fuel extraction, refining, and transportation.
- **Industrial Processes:** Emissions from processes that release greenhouse gases directly, such as chemical reactions, as a result of the organization's operations.
- **Waste Management:** Emissions from the decomposition of organic waste in landfills, as well as emissions from waste treatment and disposal practices when on-site
- **On-Site Refrigeration and Air Conditioning:** Emissions from refrigerants used in on-site cooling and air conditioning systems, as these chemicals are potent greenhouse gases.

## Scope 1, 2, and 3 in GHG accounting

### Scope 2



Scope 2 encompasses indirect emissions generated from the consumption of purchased energy, such as electricity, heating, or cooling. These emissions occur offsite but are associated with an organization's operations. These emissions occur offsite but are linked to an organization's activities. Here are some key components of Scope 2 emissions:

- **Purchased Electricity:** Emissions generated during the production of the electricity that an organization purchases and consumes. This includes emissions from power plants that produce the electricity used by the organization.
- **Purchased Heating and Cooling:** Emissions from the production of heat and cooling energy that an organization buys and uses for its operations.

#### ***Location-based vs market-based approaches***

There are two methods for calculating Scope 2 emissions: location-based and market-based methods.

- The **market-based approach** involves accounting for emissions based on the specific energy sources an organization purposefully purchases, considering the emissions factors associated with each source. For example, companies can purchase renewable energy credits (RECs).
- The **location-based method** employs average emissions factors based on the overall energy mix of a geographic area's electricity grid. While simpler to calculate, this approach may not account for an organization's efforts to use cleaner energy and might not fully represent its sustainability initiatives.



## Scope 1, 2, and 3 in GHG accounting

### Scope 3

Scope 3 emissions encompass a wide array of indirect greenhouse gas emissions that occur throughout an organization's value chain, beyond its direct operational boundaries. These emissions reflect the entire lifecycle of products and services an organization uses or produces, as well as other activities that indirectly influence its environmental impact. Scope 3 emissions are often the most complex and challenging to quantify due to the diverse range of activities involved.

Broadly, Scope 3 can be separated into upstream and downstream activities, as the diagram below shows. In Manufacture 2030, we estimate emissions from upstream Scope 3 only. Typical sources of emissions for manufacturing facilities can include:

- Material extraction and processing (included within 'purchased goods and services')
- Upstream transportation and distribution of getting materials to a user's facility
- Waste generated in operations which would include any waste treated off-site. Bear in mind that any waste treatment that occurs on-site (e.g., incineration of waste in owned incinerators) would be classed as Scope 1
- Energy-related activities outside the manufacturing facility, including the extraction, processing, and transportation of energy sources like coal, oil, and natural gas.

