



# Microsoft Cloud for Sustainability **in a Day**

## Lab 03: Emission calculations

Step-by-Step Lab

90 minutes

October 2022

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# Overview

## Background

In the previous two labs, we laid the foundation for emission calculations by setting up the organization, reference data such as Contractual instrument types and ingesting the Activity data. Now that the groundwork and data has been laid for emission calculations, this lab will focus on performing the emission calculations using a combination of factor libraries, emission factors, estimation factors and calculation profiles. Once the calculations are performed, we will review the emission calculations output.

## Learning Objectives

In this lab, you will do the following:

- Review the Microsoft Sustainability Manager's Dynamic calculation capabilities using Factor libraries, Emission factors and more.
- Review the existing "EPA 2021 - eGRID" factor library and emission factors
- Create a new custom factor library for estimating miles to kilowatt hours (kWh)
- Create new calculation models and new calculation profiles for calculation jobs
- The emissions calculated during this lab exercise will be utilized in the remaining scenarios (reporting and goals) in the upcoming lab exercises.

## Prerequisites

- Microsoft Sustainability manager environment is set up with sample data
- Lab 01 organization and reference data is entered
- Lab 02 activity data is ingested

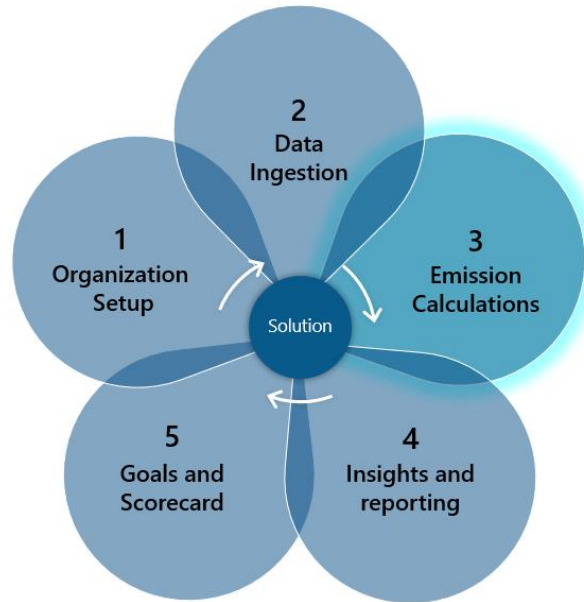
## Solution Focus Area

In the Emission calculations focus area calculation models are designed to calculate the emissions produced by the ingested activity data. The setup of the calculations breaks it down into two concepts: factor mappings and calculation models. Currently, Sustainability Manager has been verified with EPA default calculations and factor sets only. Additional factor sets will be available over time. Any factor set can easily be added or created by organizations based on their own business needs and regional requirements.

The following terminologies will be used throughout the configuration of Emission Calculations:

- **Estimation Factor:** Provides a way to convert from one unit type to another, such as night stays to kilowatt hour (kWh) used.
- **Emission Factor:** Defines the amount of greenhouse gas emitted by a given unit type, this includes defining gas emissions such as CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O.
- **Factor Mapping:** Provides a way to map reference data to a specific emission factor, simplifying calculation models by allowing customers to choose a reference data type and allowing the system to find the appropriate emission factor.
- **Factor Library:** A collection/grouping of emission or estimation factors and factor mappings, used by calculation models.
- **Calculation Model:** Thought of as the instruction set used by the application to perform the emission calculations, utilizes factor libraries, factor mappings, and emission/estimation factors to perform the emission calculations.

- **Calculation Profile:** Provides the scheduling for calculation jobs, defining activity data filter and the calculation model (instruction set) to use.



## Personas and Scenarios

In this lab, Alex Serra – Emissions Analyst for Wide World Importers sets up factor mappings for Purchased electricity for facilities, mapping Contractual instrument types to the Florida electric grid (FRCC).

Alex also creates a new estimation factor library for estimating miles driven to kilowatt hours (kWh) for Fabrikam electric trucks. Alex then creates calculation models for calculating the carbon emissions produced per the facility's purchased electricity. Post that, Alex creates a calculation model for estimated carbon emissions produced by the purchased electricity for charging Fabrikam Electric trucks (based on the kWh per mile driven estimate).

Finally, Alex creates and runs calculation profiles, filtering to Wide World Importers activity data. Post running the Calculation profile, Alex reviews the calculated emissions data before notifying Amber Rodriguez – Sustainability specialist that the emission calculations are complete.



### Sustainability Lead

*"I provide the requested data from my department to our sustainability team partners"*

**Jessie Irwin**  
Contoso Corp



### Sustainability Specialist

*"I am responsible for all emissions reporting tasks at my company"*

**Amber Rodriguez**  
Contoso Corp



### Emissions Analyst

*"I analyze emissions data & send results of analyses to other stakeholders"*

**Alex Serra**  
Wide World Importers



### IT Admin

*"I'm involved in collecting emissions data and inputting it into our database."*

**Reed Flores**  
Wide World Importers

In this lab exercise, we will focus on the scenarios illustrated below:

### Lab 3



Amber & Jessie introduce Sustainability Manager to Alex and then asks them to fill out the Inventory Plan. Alex does the scoping and with Reed's help, starts setting up the Wide World Importers Organization data and Reference Data.



**Reed** uses the data connectors to import the excel spreadsheet Alex gave them for 1) Electricity Purchased for all of Year 2021 2) Miles driven by Fabrikam Electric Trucks.



**Alex** sets up the Factor Mappings for Purchased electricity and a Factor Library for Miles driven by Electric Vehicles including the Calculations. They then set up calculation profiles for Purchased electricity for facilities, and Miles driven by Electric Vehicles



Amber validates and reviews the data in the Insights section and tells Jessie that the Wide world data is available for them to review. **Jessie** opens the Reporting section to create a new Emissions report.



**Amber** goes into the Scorecards section to set up goals for Wide World Importers to reduce their carbon emissions to 600 mtCO2e by end of 2025.

Set up Organization and Reference Data

Ingest Emissions Activity Data

Design Calculation Models and Jobs

Build Reports and gather Insights

Create Carbon Reduction Goals and Scorecards

# Exercise 1: Set up Factor Libraries

In this exercise, you will learn about the steps that Alex takes to define the factor mappings for Purchased electricity, and an estimation factor library for estimating the amount of electricity purchased based on the Miles driven by Wide World Importers fleet of electric trucks. While electric vehicles do not have Scope 1, direct tailpipe emissions, they do have to be charged while transporting goods, in this case - across the USA. This charging of Electric trucks results in Scope 2 purchased electricity.

Wide World Importers may not know exactly how much electricity was purchased for charging the Electric Trucks, which grids the electricity came from, or what the energy source is. However, Wide World Importers can estimate the amount of electricity purchased by identifying how many kilowatt hours (kWh) are used per 100 miles, based on EPA vehicle efficiency data. You can explore this functionality in deeper detail on Microsoft Docs, please visit [Overview of Emission factors](#).

Log in to your Cloud for Sustainability environment at <https://make.powerapps.com>  
Open the **Sustainability Manager** Application

Name	Modified	Owner	Type
Sustainability Manager	2 wk ago	Steven Pride	Model-driven
Solution Health Hub	2 wk ago	SYSTEM	Model-driven

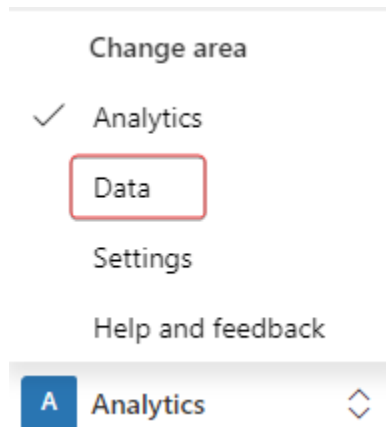
## Important

Please make sure that you have completed the previous lab to create Activity Data. The emissions calculations require all the Data Ingestion processes from the previous lab to be completed. Failure to do so will result in errors or incorrect values during the calculations

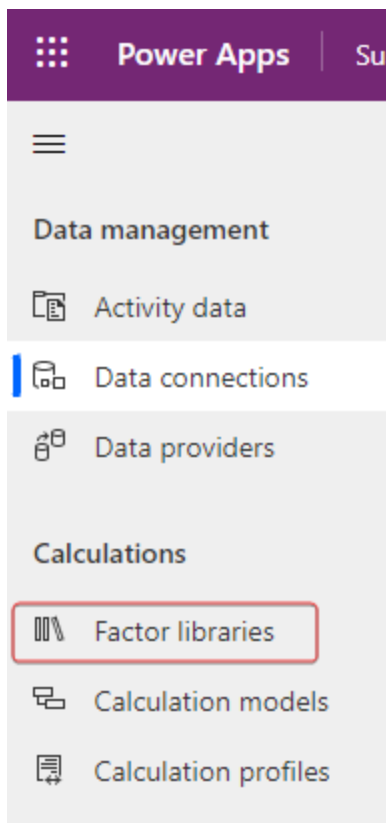
## Task 1: Add eGRID Factor mappings

In this task, Alex will create factor mappings to map the Contractual instrument types, for Wide World Importers that were added by Reed previously, to the respective electric grid emission factor. This allows Microsoft Sustainability Manager to find the correct electric grid for a given Contractual instrument type. This can be expanded to map other reference data to specific emission factors, avoiding the need to create calculations models that are for specific emission factors.

1. In the bottom left corner, change your Area to **Data**



2. Navigate to **"Factor libraries"** on the left side of the page.



3. Click on the **"EPA 2021 - eGRID"** Factor library to open the Factor library

## Factor libraries ▾

Factors are used in calculation models to convert one type of data into another type. For example, one emission factor can convert electricity usage

Create new library

**Note:** Microsoft Sustainability Manager includes EPA and IPCC based Factor libraries for emissions and estimations. Additional libraries are on the roadmap. Take time to review the existing factor libraries.

### Emission factors

Name	Type	Version	Year
<a href="#">Demo energy emission factor library</a>	Demo		
<a href="#">Demo energy market based</a>	Demo		
<a href="#">EPA 2020 - Supply chain GHG emission factors - v1.0</a>	Standard		2020
<a href="#">EPA 2021 - Business travel GHG emission factors</a>	Standard		2021
<a href="#">EPA 2021 - eGRID</a>	Standard		2021
<a href="#">EPA 2021 - Mobile Combustion Fuels</a>	Standard		2021

4. Let's take a moment to **explore** the EPA 2021 - eGRID factor library. The General tab includes identifying information about the Factor library.
- **Name:** this is used for identifying the factor library in the list.
  - **Description:** this is used to provide more information about the factor library
  - **Documentation reference:** this is used to identify the documentation used to generate the factor library
  - **Type of factor library:** this is used to identify if this factor library is a Custom, Demo (sample), or Standard (pre-loaded based on EPA libraries)
  - **Library type:** this functionally switches the library type between Emission or Estimation Library. Emission Libraries are used to calculate emission gases, and Estimation Libraries are used to create estimated conversions from one unit type to another, such as night stays at a hotel to kWh used.

### EPA 2021 - eGRID - Saved

Factor library

General Emission factors Factors mapping Related

Name	* EPA 2021 - eGRID	Type	* Standard
Description	eGrid, steam, and heat factors	Library type	* Emission factor library
Documentation reference	<a href="https://www.epa.gov/climatelead...">https://www.epa.gov/climatelead...</a>	Version	---
Date published	2021	Origin correlation ID	---



5. Click on the "Emission factors" tab to see a list of Emission factors in the Factor library.

## EPA 2021 - eGRID - Saved

Factor library

General **Emission factors** Factors mapping Related

Name	* EPA 2021 - eGRID	Type	* Standard
Description	eGrid, steam, and heat factors	Library type	* Emission factor library
Documentation reference	<a href="https://www.epa.gov/climatelead...">https://www.epa.gov/climatelead...</a>	Version	---
Date published	2021	Origin correlation ID	---

6. The Emission factors list displays the name of the emission factor, the unit type, sub type, documentation reference, and gases generated. As Wide World Importers is a Florida based business and is connected to the FRCC electrical grid, **select FRCC (FRCC All)** from the list of Emission factors.

## EPA 2021 - eGRID - Saved

Factor library

General **Emission factors** Factors mapping Related

SRSO (SERC South)	MWh	eGRID
<b>FRCC (FRCC All)</b>	MWh	eGRID
NYLI (NPCC Long Island)	MWh	eGRID
HIMS (HICC Miscellaneous)	MWh	eGRID

7. The FRCC (FRCC All) Emission factor shows us the carbon emissions produced, 861lb of CO<sub>2</sub>, 0.055lb of CH<sub>4</sub>, and 0.007lb of N<sub>2</sub>O, **per megawatt hour (MWh) of energy consumed**. This information is important to understand how our final CO<sub>2</sub>E (Carbon equivalent) will be calculated later. When creating a new emission factor, you will want to define how much of each gas is produced per a given unit. There are several other gas types that can be tracked as seen on the screen, depending on the scenario some or all of them may be used.

## FRCC (FRCC All) - Saved

Emission factor

General Related

Factor library	*  EPA 2021 - eGRID
Type	eGRID
Sub type	Total output
Name	* FRCC (FRCC All)
Identifier	---
Description	---
Unit	*  MWh
Documentation reference	EPA eGRID2019, February 2021
Is biofuel	No
Origin correlation ID	---
Connection	---

CO <sub>2</sub>	861.0000000000	CO <sub>2</sub> unit	*  lb
CH <sub>4</sub>	0.0550000000	CH <sub>4</sub> unit	*  lb
N <sub>2</sub> O	0.0070000000	N <sub>2</sub> O unit	*  lb
HFCs	---	HFCs unit	---
PFCs	---	PFCs unit	---
SF <sub>6</sub>	---	SF <sub>6</sub> unit	---
NF <sub>3</sub>	---	NF <sub>3</sub> unit	---
Other GHGs	---	Other GHGs unit	---
CO <sub>2</sub> E	---	CO <sub>2</sub> E unit	---

- Return to EPA 2021 - eGRID by clicking on the back arrow, and click on the **"Factors mapping"** tab

## EPA 2021 - eGRID - Saved

Factor library

General Emission factors **Factors mapping** Related

Name	* EPA 2021 - eGRID
Description	eGrid, steam, and heat factors
Documentation reference	<a href="https://www.epa.gov/climateleadership/ghg-emission-factors-hub">https://www.epa.gov/climateleadership/ghg-emission-factors-hub</a>
Date published	2021

**Note:** Factor mappings help map emission factors to reference data. Microsoft Sustainability Manager will use the factor mappings to find the correct emission factor to be used in an emission calculation for a given activity data. This is based on the reference data linked on the activity data, such as vehicle type or contractual instrument type

- Alex will create factor mappings for the two Contractual instrument types created in previous labs and associate them to the FRCC (FRCC All) emission factor. Each of the Contractual instruments are local power providers in Florida and are part of the FRCC electric grid. Click **" +New Factor mapping"**

New Factor mapping

Refresh

Flow

Name

↑

Description

Reference data

Factor

Connection

Origin correlation ID

No data available

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←

Page 1

→

10. Alex will use the following information to populate the fields on the new Factor mapping:

- **Name:** FRCC - Purchased Electricity - VanArsdel Ltd
- **Reference Data:** VanArsdel Ltd
- **Factor:** FRCC (FRCC All)

11. The fields and their values are **explained** below:

- 1) The **Name** of the factor mapping is used for identifying the factor mapping in the list.
- 2) The **Reference Data** is mapping the Contractual Instrument Type.
- 3) The **Factor** is mapping the Emission Factor
- 4) Click "**Save & Close**" to save the record.

← Save Save & Close + New Flow

**4**

**New Factor mapping** - Unsavd

**General**

Name	* FRCC - Purchased Electricity - VanArsdel Ltd <b>1</b>
Description	---

Factor library	* EPA 2021 - eGRID
Reference data	* VanArsdel Ltd <b>2</b>
Factor	* FRCC (FRCC All) <b>3</b>
Origin correlation ID	---

12. Click "**+New Factor mapping**"

+ New Factor mapping						Refresh	Flow	
Name ↑	Description	Reference data	Factor	Connection	Origin correlation ID			
FRCC - Purchased Electricity - VanArsdel ...		VanArsdel Ltd	FRCC (FRCC All)					

13. Alex will use the following information to populate the fields on the new Factor mapping:

- **Name:** FRCC - Purchased Electricity - Adatum Corp
- **Reference Data:** Adatum Corp
- **Factor:** FRCC (FRCC All)

14. The fields and their values are **explained** below:

- 5) The **Name** of the factor mapping is used for identifying the factor mapping in the list.
- 6) The **Reference Data** is mapping the Contractual Instrument Type.
- 7) The **Factor** is mapping the Emission Factor
- 8) Click **"Save & Close"** to save the record.

← Save Save & Close New Flow

**4**

**New Factor mapping** - Unsaved

General

Name *	FRCC - Purchased Electricity - Adatum Corp <b>1</b>
Description	---

Factor library *	EPA 2021 - eGRID
Reference data *	Adatum Corp <b>2</b>
Factor *	FRCC (FRCC All) <b>3</b>
Origin correlation ID	---

15. There are now two **Factor mappings**, one for each of the contractual instruments added during the previous labs.

EPA 2021 - eGRID - Saved  
Factor library

General Emission factors Factors mapping Related

Name ↑	Description ↓	Reference data ↓	Factor ↓	Connection ↓	Origin correlation ID ↓
FRCC - Purchased Electricity - Adatum C...		Adatum Corp	FRCC (FRCC All)		
FRCC - Purchased Electricity - VanArsdel ...		VanArsdel Ltd	FRCC (FRCC All)		

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Page 1

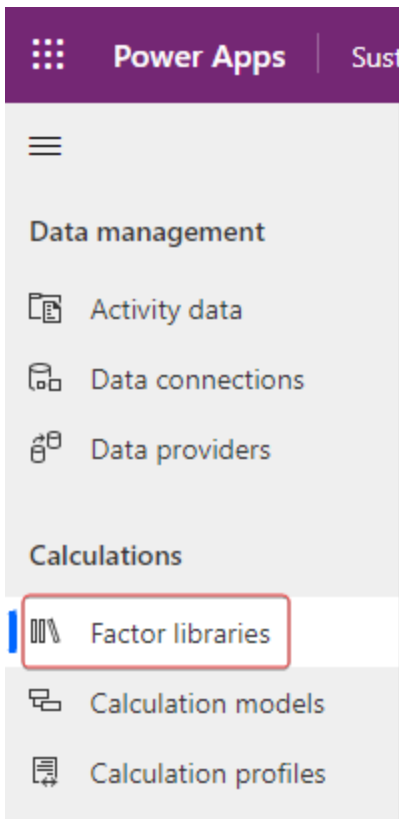
Great job, you have completed adding the factor mappings for your Purchased electricity activity data! This is an important step toward the creation of calculation models that will calculate emissions for multiple emission factors based on reference data, such as Contractual Instrument Types or Facilities.

By creating these factor mappings, we can choose Contractual Instrument Types as emission factor during our calculation model creation. This tells Microsoft Sustainability Manager to map the contractual instrument type on an activity data record to the emission factor listed in the factor mapping. This allows you to create more dynamic calculations rather than calculations specific to a given emission factor. We will go into more detail on this later in this lab. **Please continue to the next task.**

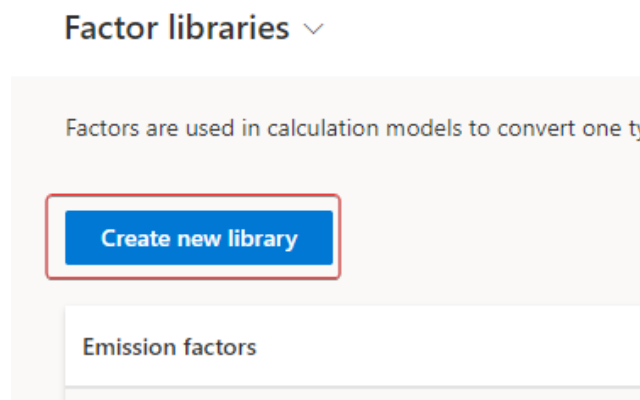
## Task 2: Create Estimation Factor Library

In this task, Alex will create an estimation factor library to define the estimation factor for estimating the kilowatt hours (kWh) used per miles driven. While electric vehicles do not have Scope 1, direct tailpipe emissions, they do have to be charged while transporting goods across the USA, resulting in Scope 2 purchased electricity. Wide World Importers may not know exactly how much electricity was purchased, what grid the electricity came from, or what the energy source is; however, Wide World Importers can estimate the amount of electricity purchased by identifying how many kilowatt hours (kWh) are used per 100 miles, based on EPA vehicle efficiency.

1. Navigate to **"Factor libraries"** on the left side of the page.



2. Click **"Create new library"**



3. Alex will use the following information to populate the fields on the new Factor library:
  - **Name:** Electric Vehicle Estimation Library
  - **Description:** Scope 2 Emissions from Electric Vehicles
  - **Documentation reference:** <https://fueleconomy.gov/feg/byfuel/EV2022.shtml>
  - **Type:** Custom
  - **Library Type:** Estimation factor library
4. The fields and their values are **explained** below:
  - 1) The **Name** of the factor library, this is used for identifying the factor library in the list.
  - 2) The **Description** of the factor library is used to provide more information about the factor library for others
  - 3) The **Documentation reference** for the factor library is used to identify the documentation used to generate the factor library
  - 4) The **Type** of factor library is used to identify if this factor library is a Custom, Demo (sample), or Standard (pre-loaded based on EPA libraries)
  - 5) The **Library Type** of the factor library, this functionally switches the library type between Emission or Estimation Library. Emission Libraries are used to calculate emission gases, and Estimation Libraries are used to create estimated conversions from one unit type to another, such as 100 miles driven to kWh.
  - 6) Click "**Save & Close**" saves the record.

The screenshot shows the 'New Factor library' form with the following fields and values:

New Factor library - Unsaved	
General   Estimation Factors   Factors mapping	
Name *	Electric Vehicle Estimation Library <b>1</b>
Description	Scope 2 Emissions from Electric Vehicles <b>2</b>
Documentation reference	<a href="https://fueleconomy.gov/feg/byfuel/EV2022.shtml">https://fueleconomy.gov/feg/byfuel/EV2022.shtml</a> <b>3</b>
Date published	---
Type *	Custom <b>4</b>
Library type *	Estimation factor library <b>5</b>
Version	---
Origin correlation ID	---

Callout 6 points to the 'Save & Close' button in the top navigation bar.

Great job, you have created an **Estimation Library**. Estimation Libraries are the first step to utilizing estimations for emissions where you may not be able to determine the exact emissions. Some examples of estimations include estimating the amount of natural gas and electricity per hotel night stay during business travel, or vehicle fuel consumption by distance traveled. **Please continue to the next task.**

### Task 3: Create Estimation Factor

In this task, Alex will create the estimation factor for estimating the kilowatt hours (kWh) used per miles driven. The EPA estimates electric vehicle efficiency in kilowatt hours (kWh) per 100 miles. Alex will use this same metric in the estimation factor to ensure that the estimation factor is consistent with the EPA.

1. On the Factor library view, select the Electric Vehicle Estimation Library (this will be near the bottom of your page).

Estimation factors					
Name	Type	Version	Year	Description	Origin...
Electric Vehicle Estimation Library	Custom			Scope 2 Emissions from EL...	
EPA 2018 - Business travel electricity GHG estimation factors	Standard		2018	Converts hotel night stays ...	
EPA 2018 - Business travel natural gas GHG estimation factors	Standard		2018	Converts hotel night stays ...	
EPA 2022 - Stationary Fuels Heat Content Conversion	Standard		2022	Heat Content (HHV) per m...	

- Click on the **"Estimation Factors"** tab

## Electric Vehicle Estimation Library

Factor library

**Note:** For the purposes of this lab, we chose the largest electric vehicle available on the EPA, fueleconomy.gov website. **This is only an example.**

**General** **Estimation Factors** Factors mapping Related

Name	* Electric Vehicle Estimation Library
Description	Scope 2 Emissions from Electric Vehicles
Documentation reference	<a href="https://fueleconomy.gov/feg/byfuel/EV2022.shtml">https://fueleconomy.gov/feg/byfuel/EV2022.shtml</a>
Date published	---

- Click **+New Estimation factor**

Electric Vehicle Estimation Library - Saved  
Factor library

General **Estimation Factors** Factors mapping Related

<div> + New Estimation factor Refresh Flow </div>									
Name ↑	Description	Unit	Type	Sub type	Document...	Factor value	Factor valu...	Origin corr...	Connection
No data available									
0 - 0 of 0 Page 1									

- Alex, reviews the Fabrikam electric truck details on the EPA website and determines the following information needs to be populated on the new Estimation factor:

- **Name:** Fabrikam Electric Truck - EPA Estimate
- **Documentation reference:** <https://fueleconomy.gov/feg/noframes/45318.shtml>
- **Factor Library:** Electric Vehicle Estimation Library
- **Unit:** 100 Mile
- **Factor value:** 49.00
- **Factor value unit:** kWh

5. The fields and their values are **explained** below:

- 1) The **Name**, this is used for identifying the emission factor in the list.
- 2) The **Documentation reference**, this is used to identify the documentation used to generate the estimation factor
- 3) The **Factor library** links the estimation factor to the factor library. This will default if you click "New Estimation factor" while you are in a factor library.
- 4) The **Unit** is used to identify what unit will be converted
- 5) The **Factor value** is used to determine the amount to be estimated per the Factor value unit
- 6) The **Factor value unit** is used to specify the unit type to be converted to.
- 7) Click "**Save & Close**" saves the record.

← Save Save & Close + New Flow

**7**

**New Estimation factor** - Unsaved

**General**

Name	* Fabrikam Electric Truck - EPA Estimate <b>1</b>
Description	---
Documentation reference	<a href="https://fueleconomy.gov/feg/noframes/45318.shtml">https://fueleconomy.gov/feg/noframes/45318.shtml</a> <b>2</b>
Factor library	* <a href="#">Electric Vehicle Estimation Library</a> <b>3</b>
Origin correlation ID	---
Connection	---

Unit	* <a href="#">100 mile</a> <b>4</b>
Factor value	* 49.0000000000 <b>5</b>
Factor value unit	* <a href="#">kWh</a> <b>6</b>
Type	---
Sub type	---

6. The new Emission factor is estimating that every 100 miles is equivalent to 49 kWh

#### Electric Vehicle Estimation Library - Saved

Factor library

General **Estimation Factors** Factors mapping Related

+ New Estimation factor Refresh Flow

Name ↑	Description	Unit	Type	Sub type	Document...	Factor value	Factor valu...	Origin corr...	Connection
Fabrikam Electric Truck - EPA Estimate		100 mile			<a href="https://fue...">https://fue...</a>	49.000000...	kWh		

Great job, you have created an estimation factor. Estimation factors are important to be able to convert from one unit type to another when an estimate is appropriate, such as estimated fuel or battery economy of vehicles, or estimating gas and electric utilization of hotel stays. **Please continue to the next task.**



## Exercise 2: Set up Calculation Models

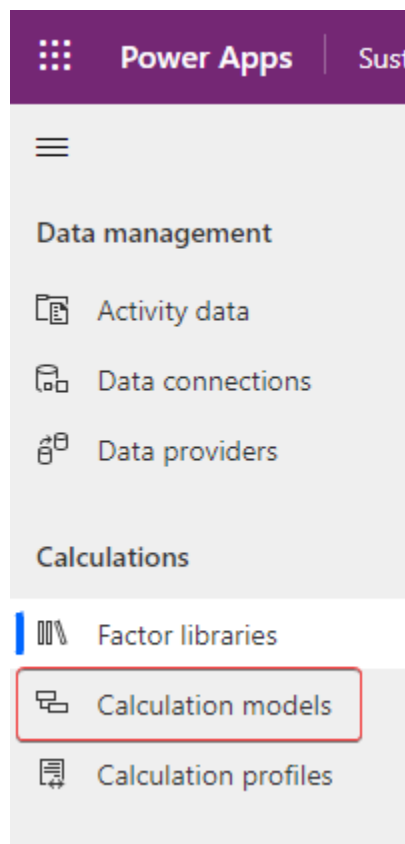
In this exercise, you will learn about the steps that Alex takes to define Calculation Models used by Microsoft Sustainability Manager to calculate emissions. Calculation Models are the instruction sets, or recipes, which define all the steps and values to use during the emission calculations. Microsoft Sustainability Manager provides several calculation models.

Take the opportunity review some of the pre-built models, they are a great source of knowledge when creating new calculation models. The calculation models can also be used as a template for new models.. The algorithm used to calculate emissions will be discussed in this exercise and the next. You can explore this functionality in deeper detail on Microsoft Docs, please visit [Overview of Calculation models](#).

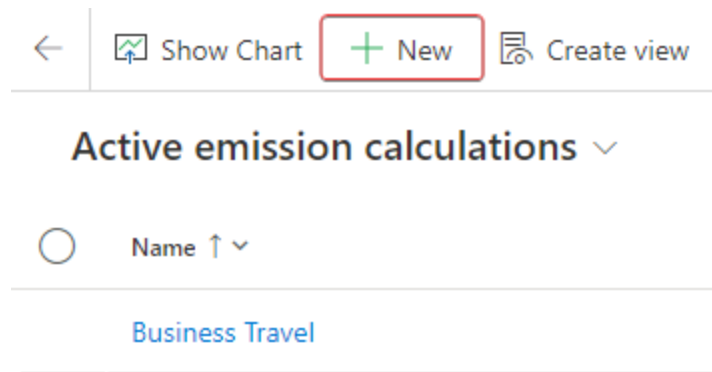
### Task 1: Create Purchased Electricity Model

In this task, Alex will create a new calculation model to calculate carbon emissions for purchased electricity based on the contractual instrument type. They will leverage the factor mappings created in the previous exercise to make the calculation model dynamically find the emission factor to be used per line of activity data.

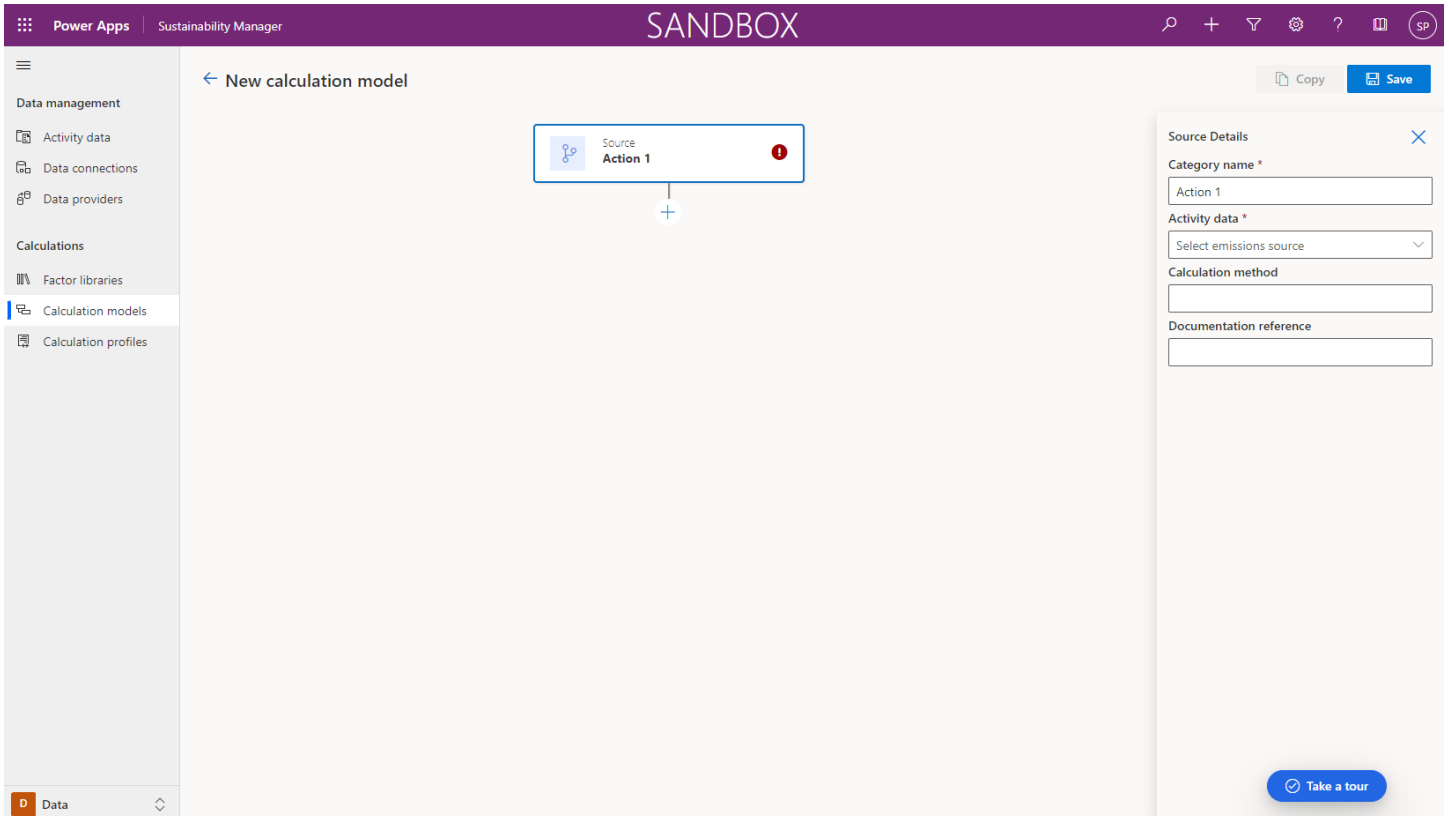
1. Navigate to "**Calculation models**" on the left side of the page.



2. Click "+New" to create a new Calculation model



3. A new page will open to configure the Calculation model. A source action is added by default.



4. Populate the Source action with the following data:

- **Category name:** Purchased Electricity: Contractual Instrument Based - 2021
- **Activity data:** Purchased electricity
- **Calculation method:** EPA Equation 1: Electricity (MWh) \* EF
- **Documentation reference:** <https://www.epa.gov/sites/default/files/2020-12/documents/electricityemissions.pdf>

5. The fields and their values are **explained** below:

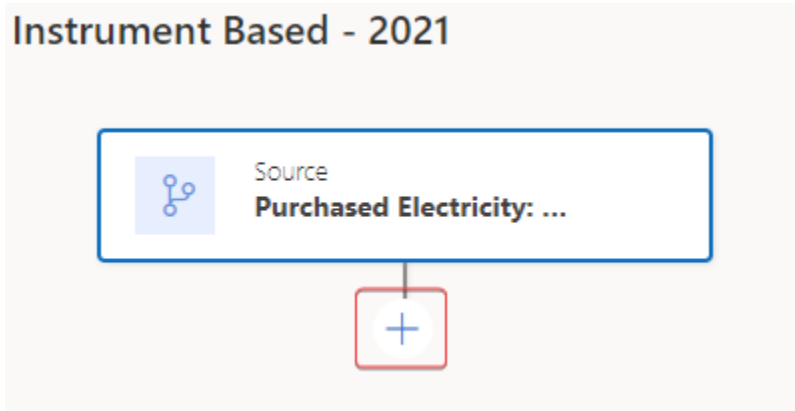
- 1) The **Category name** is used for identifying the calculation model in the list.
- 2) The **Activity data** is used to identify which type of activity data the model will process
- 3) The **Calculation method** is used to roughly note what the calculation will be doing.
- 4) The **Documentation reference** is used to identify the documentation used to create the calculation model

5) Click **"Save"** to save the record.

The screenshot shows a 'Source Details' form with the following fields and callouts:

- Copy** and **Save** buttons at the top right. The **Save** button is highlighted with a red circle and the number 5.
- Category name \*** field with the text 'Purchased Electricity: Contractual Instrume'. It is highlighted with a red circle and the number 1.
- Activity data \*** field with a dropdown menu showing 'Purchased electricity'. It is highlighted with a red circle and the number 2.
- Calculation method** field with the text 'EPA Equation 1: Electricity (MWh) \* EF'. It is highlighted with a red circle and the number 3.
- Documentation reference** field with the URL 'https://www.epa.gov/sites/default/files/20...'. It is highlighted with a red circle and the number 4.

6. Click the **+** to add a new action to the calculation model



7. Click **"Report"** on the list of Available actions.

### Available actions

Calculation

Report

Report gas

Estimation factor

Condition

**Note:** Only **Source**, **Report**, and **Estimation** actions are covered in this lab. Additional details about each available action can be found here: [Calculation models | Microsoft Docs](#)

8. A new **Report** action is added to the Calculation model. Select that action to configure it.

The screenshot shows the Power Apps Sustainability Manager interface in 'SANDBOX' mode. The left sidebar contains navigation options: Data management (Activity data, Data connections, Data providers), Calculations (Factor libraries, Calculation models, Calculation profiles), and Data. The main area displays a calculation model titled 'Purchased Electricity: Contractual Instrument Based - 2021'. It shows a 'Source' box labeled 'Purchased Electricity: ...' connected to a 'Report' box labeled 'Action 1'. The 'Report' box has a red information icon and a plus sign below it. On the right, the 'Report Details' panel is open, showing fields for 'Category name \*' (set to 'Action 1'), 'Description', 'Emission report value \*' (a dropdown), 'Unit \*' (a dropdown), 'Emission factor library \*' (a dropdown), 'Emission factor \*' (a dropdown), and a 'Market based' checkbox. A 'Take a tour' button is at the bottom right of the panel.

The **Report** action is used to calculate and report carbon emissions to the emissions table. This action will use the emission factor or factor mapping to identify the emission factor to be used, based on the emission factor dropdown. In this lab, the action will use contractual instrument type field to identify the factor mapping and emission factor to use in the calculation.

Once the emission factor for the activity data line has been determined, the activity data quantity and quantity unit will be converted to the same unit type as the emission factor. In this lab, the kWh from the Activity data will be converted to MWh.

After the quantity has been converted, the converted value will be multiplied against each gas listed in the emission factor, determining the volume of gases produced.

To determine the CO<sub>2</sub>E (Carbon Dioxide Equivalency), the gases produced are multiplied against their GWP factor (Global Warming Potential factor), which is stored in the "Greenhouse Gases" Dataverse table and are added together.

The **Report** action stores the gases produced values, CO<sub>2</sub>E value, and other identifying information about the activity data row in the emissions table.

9. Populate the Report action with the following data:

- **Category name:** Electricity \* EF (Contractual Instrument Type)
- **Description:** EPA Equation 1: Electricity (MWh) \* EF
- **Emission report value:** Quantity
- **Unit:** Quantity unit

- **Emission factor library:** EPA 2021 - eGRID
- **Emission factor:** Contractual Instrument Type

10. The fields and their values are **explained** below:

**Note:** This value can also be determined by a Power Fx expression if a more complex value is needed instead of a specific field.

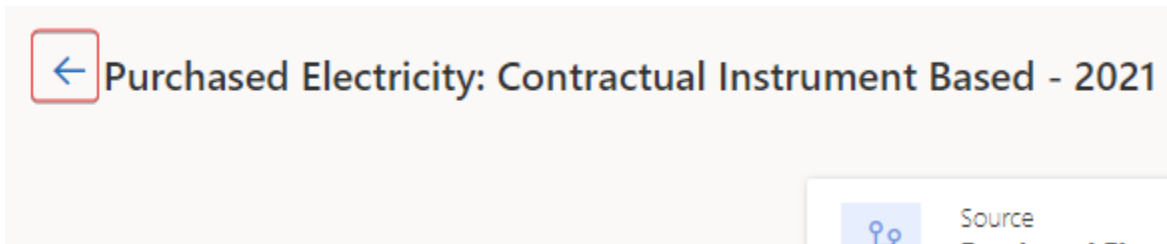
- 1) The **Category name** is used for identifying the action in the calculation model.
- 2) The **Description** is used to roughly note what the calculation will be doing.
- 3) The **Emission report value** is used to identify which field from the activity data type should be used to retrieve the value used in the emission calculation.
- 4) The **Unit** is used to identify the field from the activity data type to be used to retrieve the unit type of the value. Alternatively, a unit can be specified to always be used in the action, regardless of which unit is specified on the activity date type.
- 5) The **Emission factor library** is used to identify which factor library will be used to identify the emission factor.
- 6) The **Emission factor** is used to identify which emission factor or factor mapping will be used to calculate the emissions. Choosing a factor mapping will allow multiple reference data values to map to an emission factor, allowing for a calculation model to not be bound to a single emission factor.
- 7) Click "**Save**" to save the record.

The screenshot shows a 'Report Details' form with the following fields and values, each highlighted with a red circle and a number:

- Category name \***: Electricity \* EF (Contractual Instrument Type) (1)
- Description**: EPA Equation 1: Electricity (MWh) \* EF (2)
- ☐ **Power Fx experience**
- Emission report value \***: Quantity (3)
- Unit \***: Quantity unit (4)
- Emission factor library \***: EPA 2021 - eGRID (5)
- Emission factor \***: Contractual Instrument Type (6)
- ☐ **Market based**
- Save** button (7)

At the top of the form are 'Copy' and 'Save' buttons. The 'Report Details' title has a close button (X) to its right. The 'Last updated' timestamp is 8/11/2022 9:23 PM.

11. Click the **back arrow on the record** to return to the list of Calculation models



12. The new Calculation model should now appear in the list

Name	Type	Emissions source	Description	Calculation method	Documentation ref...	Version
Business Travel	Standard	Business travel		EPA Business Trav...	https://ghgprotoc...	
Capital Goods	Standard	Capital goods		Spend type * com...	https://ghgprotoc...	
Downstream Transportation and Distribution	Standard	Downstream tran...		Ton/mile * distan...	https://www.epa...	
Fugitive Emissions	Standard	Fugitive emissions		EPA's Screening M...	https://www.epa...	
Mobile Combustion	Standard	Mobile combustion		EPA Equation 1.4.5	https://www.epa...	
Purchased Cooling	Standard	Purchased cooling		Emissions = Elect...	https://www.epa...	
Purchased Electricity: Contractual Instrument Based - 2021	Custom	Purchased electri...		EPA Equation 1: El...	https://www.epa...	
Purchased Electricity: Location-Based	Standard	Purchased electri...		EPA Equation 1: El...	https://www.epa...	
Purchased Electricity: Market Based	Standard	Purchased electri...		EPA Equation 1: El...	https://www.epa...	
Purchased Electricity: Renewable	Standard	Purchased electri...		EPA, Table 6, Equa...	https://www.epa...	
Purchased Goods and Services	Standard	Purchased goods ...		Spend type * com...	https://ghgprotoc...	
Purchased Heat	Standard	Purchased heat		Emissions = Elect...	https://www.epa...	
Stationary Combustion	Standard	Stationary combu...		Fuel Analysis Met...	https://www.epa...	
Stationary Combustion HHV Fuels	Standard	Stationary combu...		Fuel Conversion	https://www.epa...	
Upstream Transportation and Distribution	Standard	Upstream transp...		Ton/mile * distan...	https://www.epa...	

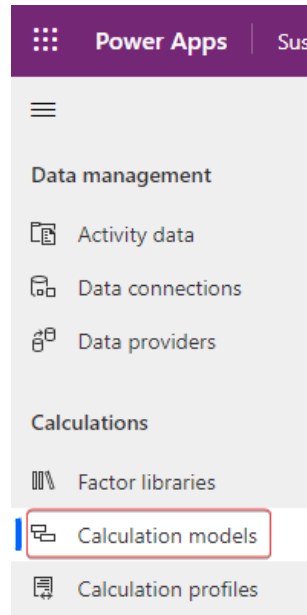
Great job, you have created a new Calculation model. In this Calculation model you have utilized factor mappings, an important differentiator for Microsoft Cloud for Sustainability. Factor mappings allow the Calculation models to be more dynamic by mapping reference data to emission factors, allowing you to have one model that can calculate for multiple emission factors. Calculation models are the instruction sets that are used by Microsoft Cloud for Sustainability to calculate emissions. There are several calculation models that are included with Microsoft Cloud for Sustainability based on EPA calculations. Sometimes these included models may not match your unique customer needs and you will need to create new models to provide custom calculations, be sure to review some of the included models to see other types of complex calculation models. **Please continue to the next task.**

## Task 2: Create Electric Vehicle Miles Driven Model

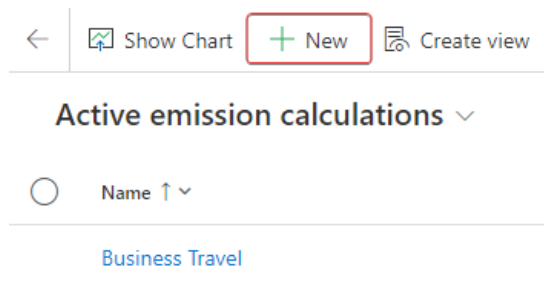
In this task, Alex will create a new calculation model to calculate carbon emissions for miles driven by electric vehicles. They will leverage the estimation factor library created in the previous exercise to first estimate the

kilowatt hours (kWh) used by an electric vehicle, then calculate the carbon emissions for that electricity based on the US Average emission factor.

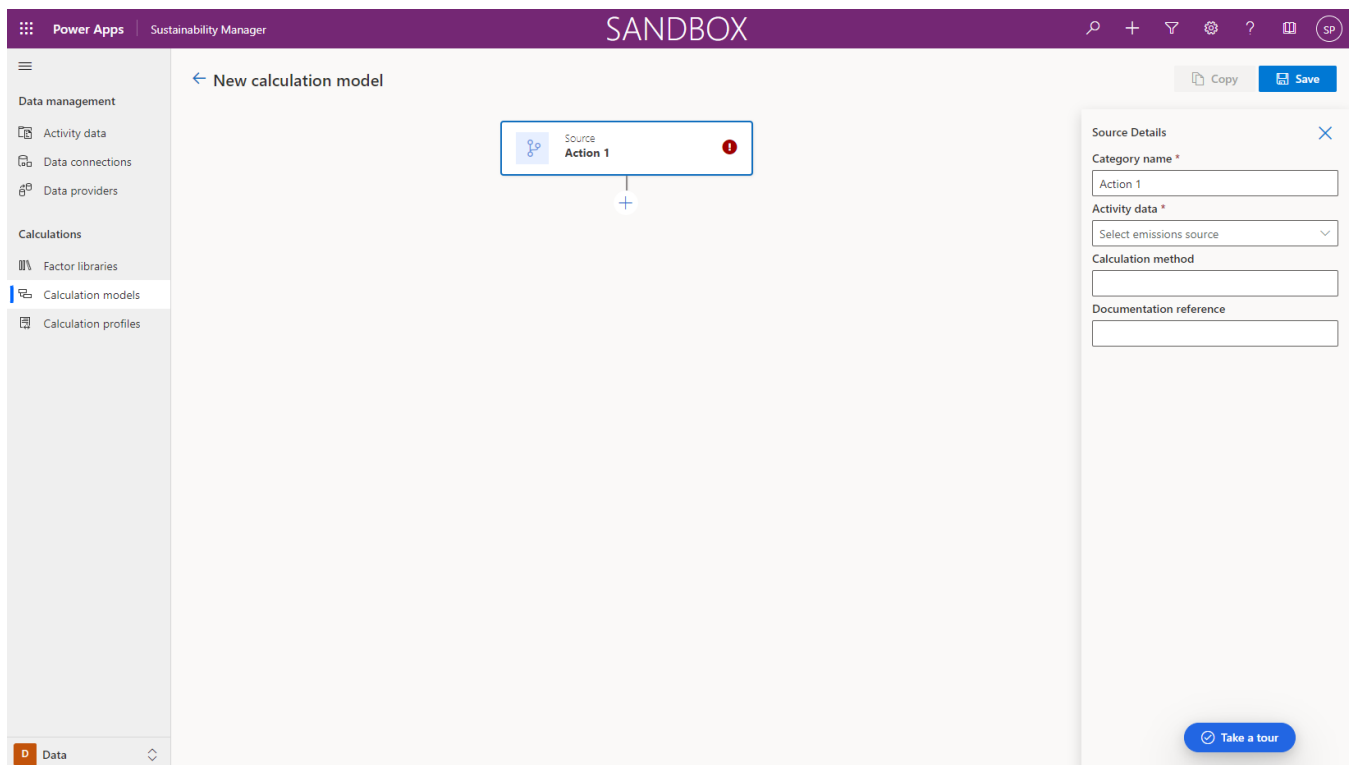
1. Navigate to "**Calculation models**" on the left side of the page.



2. Click "**+New**" to create a new Calculation model



3. A new page will open to configure the Calculation model. A source action is added by default.



4. Populate the Source action with the following data:
  - **Category name:** Electric Vehicle Miles Driven - 2021
  - **Activity data:** Purchased electricity
  - **Calculation method:** Miles Driven to kWh \* EF
  - **Documentation reference:** <https://fueleconomy.gov/feg/byfuel/EV2022.shtml>
5. The fields and their values are **explained** below:
  - 1) The **Category name** is used for identifying the calculation model in the list.
  - 2) The **Activity data** is used to identify which type of activity data the model will process
  - 3) The **Calculation method** is used to roughly note what the calculation will be doing.
  - 4) The **Documentation reference** is used to identify the documentation used to create the calculation model
  - 5) Click "**Save**" to save the record.



Copy

Save

5

Source Details

×

Last updated: 8/11/2022 9:39 PM

Category name \*

Electric Vehicle Miles Driven - 2021

1

Activity data \*

Purchased electricity

2

Calculation method

Miles Driven to kWh \* EF

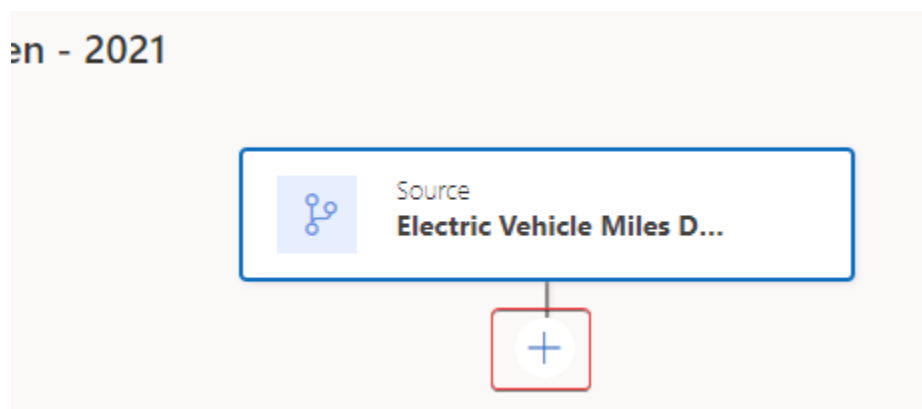
3

Documentation reference

<https://fueleconomy.gov/feg/byfuel/EV20>

4

- Click the + to add a new action to the calculation model



- Click "**Estimation factor**" on the list of Available actions

Available actions

×

Calculation

Report

Report gas

Estimation factor

Condition

8. A new action is added to the Calculation model. Select that action to configure it.

The screenshot shows the Power Apps Sustainability Manager interface. The top bar is purple with 'Power Apps' and 'Sustainability Manager' on the left, and 'SANDBOX' in the center. On the right of the top bar are icons for search, add, filter, settings, help, and a user profile. The left sidebar contains a menu with 'Data management' (Activity data, Data connections, Data providers) and 'Calculations' (Factor libraries, Calculation models, Calculation profiles). The main area is titled 'Electric Vehicle Miles Driven - 2021' and shows a diagram with a 'Source' box labeled 'Electric Vehicle Miles D...' connected to an 'Estimation factor' box labeled 'Action 1'. A plus sign is below the 'Action 1' box. On the right, the 'Estimation factor Details' panel is open, showing fields for 'Category name \*' (Action 1), 'Description', 'Power Fx experience' (checkbox), 'Estimation value \*' (Select input quantity), 'Unit \*' (Select unit), 'Estimation factor library \*' (Select estimation factor library), 'Estimation factor \*' (Select estimation factor), and 'Output variable name \*'. A 'Take a tour' button is at the bottom right of the panel.

The **Estimation factor** action is used to create an estimated value for converting one unit type to another in a different unit group, such as converting night stays to kilowatt hours (kWh) used. This is important when it may be difficult to know the exact amount of a given emission source that is used. In this lab, the action will be used to convert miles driven by the fleet of electric vehicles to kWh used. This helps Wide World Importers estimate the carbon emissions for their fleet of electric vehicles that are driving across the USA and may be charging various amounts and on different grids and energy sources.

The activity data quantity and quantity unit will be converted to the same unit type as the estimation factor. In this lab, the mile unit from the Activity data will be converted to 100 mile units.

After the quantity has been converted, the converted value will be multiplied against the Factor quantity and stored in the output variable. The output variable is only accessible within the calculation model, available for use by actions further down the chain. The estimated value will not be stored in a table.

9. Populate the Estimation factor action with the following data:

- **Category name:** Estimate kWh/100 Mile
- **Estimation value:** Quantity
- **Unit:** Quantity unit
- **Estimation factor library:** Electric Vehicle Estimation Library
- **Estimation factor:** Fabrikam Electric Truck - EPA Estimate
- **Output variable name:** kWhQuantity

10. The fields and their values are **explained** below:

- 1) The **Category name** is used for identifying the action in the calculation model.

- 2) The **Estimation value** is used to identify which field from the activity data type should be used to retrieve the value used in the estimation calculation.

**Note:** This value can also be determined by a Power Fx expression if a more complex value is needed instead of a specific field.

- 3) The **Unit** is used to identify the field from the activity data type should be used to retrieve the unit type of the value. Alternatively, a unit can be specified to always be used in the action, regardless of which unit is specified on the activity date type.
- 4) The **Estimation factor library** is used to identify which factor library will be used to identify the estimation factor.
- 5) The **Estimation factor** is used to identify which estimation factor or factor mapping will be used calculate the estimation. In this scenario only one estimation factor has been created so, it does not make sense to select a factor mapping currently.
- 6) The **Output variable name** is used to name the output of the estimation factor calculation for use in actions further down the chain
- 7) Click "**Save**" to save the record.

Copy

Save

7

Estimation factor Details

Last updated: 8/11/2022 9:39 PM

Category name \*

Estimate kWh/100 Mile

1

Description

☐ Power Fx experience

Estimation value \*

Quantity

2

Unit \*

Quantity unit

3

Estimation factor library \*

Electric Vehicle Estimation Library

4

Estimation factor \*

Fabrikam Electric Truck - EPA Estimate

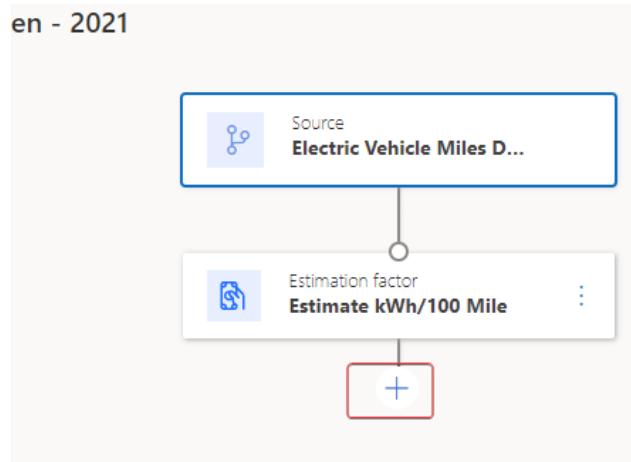
5

Output variable name \*

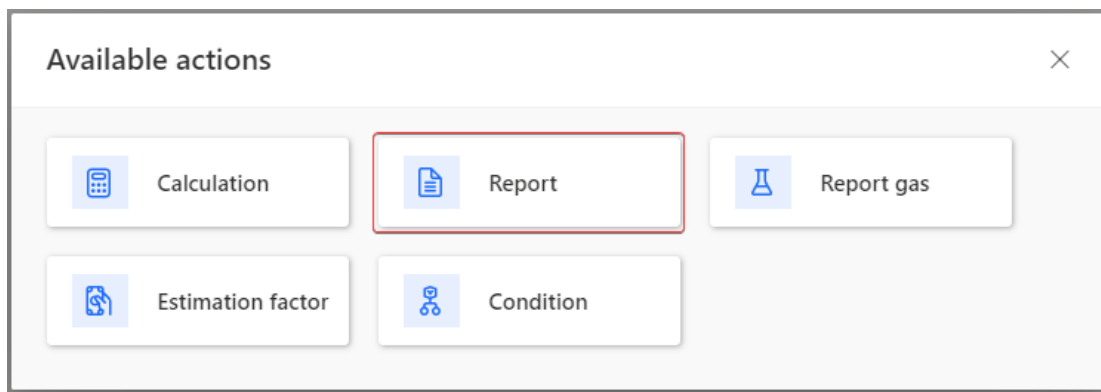
kWhQuantity

6

11. Click the + to add a new action to the calculation model



12. Click **“Report”** on the list of Available actions



13. A new action is added to the Calculation model. Select that action to configure it.

Power Apps | Sustainability Manager | SANDBOX

← Electric Vehicle Miles Driven - 2021

Report Details

Last updated: 8/11/2022 9:55 PM

Category name \*

Action 1

Description

☐ Power Fx experience

Emission report value \*

Select emission report value

Unit \*

Select unit

Emission factor library \*

Select emission factor library

Emission factor \*

Select emission factor

☐ Market based

Take a tour

14. Populate the Report action with the following data:

- **Category name:** kWh \* EF
- **Emission report value:** kWhQuantity
- **Unit:** kWh
- **Emission factor library:** EPA 2021 - eGrid
- **Emission factor:** US Average

15. The fields and their values are **explained** below:

- 1) The **Category name** is used for identifying the action in the calculation model.
- 2) The **Emission report value** is used to identify which field should be used to retrieve the value used in the emission calculation. In this scenario, the Output variable from the Estimation factor action is used.

**Note:** In this scenario, the Unit is automatically selected based on the Unit type of the Output variable from the Estimation factor node

- 3) The **Emission factor library** is used to identify which factor library will be used to identify the emission factor.
- 4) The **Emission factor** is used to identify which emission factor or factor mapping will be used to calculate the emissions. In this scenario, Alex and Wide World Importers may not know which electric grid a vehicle was charged on or the energy source, so Alex chooses the US Average emission factor to provide the estimated emissions.
- 5) Click "**Save**" to save the record.

The screenshot shows a 'Report Details' form with the following fields and values:

- Category name \***: kWh \* EF (Callout 1)
- Description**: (Empty text box)
- ☐ **Power Fx experience**
- Emission report value \***: kWhQuantity (Callout 2)
- Unit \***: kWh
- Emission factor library \***: EPA 2021 - eGRID (Callout 3)
- Emission factor \***: US Average (Callout 4)
- ☐ **Market based**

At the top right, there are 'Copy' and 'Save' buttons. The 'Save' button is highlighted with a red circle and the number 5 (Callout 5).

16. Click the **back arrow on the record** to return to the list of Calculation models



17. The new Calculation model should now appear in the list

Name	Type	Emissions source	Description	Calculation method	Documentation ref.	Version
Business Travel	Standard	Business travel		EPA Business Trav...	https://ghgprotoc...	
Capital Goods	Standard	Capital goods		Spend type * com...	https://ghgprotoc...	
Downstream Transportation and Distribution	Standard	Downstream tran...		Ton/mile * distan...	https://www.epa...	
Electric Vehicle Miles Driven - 2021	Custom	Purchased electri...		Miles Driven to k...	https://fuelcono...	
Fugitive Emissions	Standard	Fugitive emissions		EPA: Screening M...	https://www.epa...	
Mobile Combustion	Standard	Mobile combustion		EPA Equation 1,4,5	https://www.epa...	
Purchased Cooling	Standard	Purchased cooling		Emissions = Elect...	https://www.epa...	
Purchased Electricity: Contractual Instrument Based - 2021	Custom	Purchased electri...		EPA Equation 1: El...	https://www.epa...	
Purchased Electricity: Location-Based	Standard	Purchased electri...		EPA Equation 1: El...	https://www.epa...	
Purchased Electricity: Market Based	Standard	Purchased electri...		EPA Equation 1: El...	https://www.epa...	
Purchased Electricity: Renewable	Standard	Purchased electri...		EPA Table 6. Equa...	https://www.epa...	
Purchased Goods and Services	Standard	Purchased goods ...		Spend type * com...	https://ghgprotoc...	
Purchased Heat	Standard	Purchased heat		Emissions = Elect...	https://www.epa...	
Stationary Combustion	Standard	Stationary combu...		Fuel Analysis Met...	https://www.epa...	
Stationary Combustion HHV Fuels	Standard	Stationary combu...		Fuel Conversion	https://www.epa...	
Upstream Transportation and Distribution	Standard	Upstream transp...		Ton/mile * distan...	https://www.epa...	

Great job, you have created a new Calculation model. This Calculation model included an estimation factor, allowing you to calculate emissions in areas where you may not know the exact quantity of an emission source, but still need to account for the carbon emissions. Calculation models are the instruction sets that are used by Microsoft Cloud for Sustainability to calculate emissions. There are several calculation models that are included with Microsoft Cloud for Sustainability based on EPA calculations. Sometimes these included models may not match your unique customer needs and you will need to create new models to provide custom calculations, be sure to review some of the included models to see other types of complex calculation models. **Please continue to the next task.**

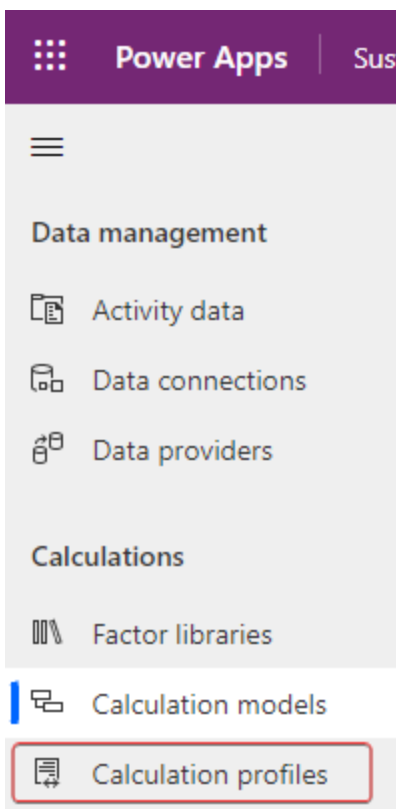
## Exercise 3: Run Calculations

In this exercise, you will learn about the steps that Alex takes to define and run Calculation Profiles. Microsoft Sustainability Manager uses calculation profiles to define the parameters and scheduling of calculation jobs. Calculation profiles allow an organization to define what activity data to calculate emissions for, any filters on that data, which Calculation model to use, and if the calculation should be redone every time the chosen activity data changes. Calculation profiles use the parameters to create calculation jobs, which are the background worker jobs iterating over an organization's activity data and determining the carbon emissions, based on the calculation model defined in the calculation profile. You can explore this functionality in deeper detail on Microsoft Docs, please visit [Overview of Calculation profiles](#).

### Task 1: Create Purchased Electricity Calculation Profile

In this task, Alex will create a Calculation Profile for the electricity purchased by Wide World Importers for their facilities for the year 2021. Alex will use the calculation model defined early in this lab and filter the profile to only activity data for the Wide World Importers organizational unit, and where the unit type is kWh. These filters will ensure that only the purchased electricity for Wide World Importers is included in the calculation job. This will exclude the miles driven by the fleet of electric vehicles, which is covered in the next task.

- 1) Navigate to "**Calculation profiles**" on the left side of the page.



- 2) Click "+**New Calculation profile**" to create a new Calculation profile

## Calculation profiles ▾

A calculation profile defines a calculation model's output. Each calculation model

Name ↑	Description	Emission
Business Travel Default Prof...	—	Business

- 3) Populate the following information on the New calculation profile wizard
  - **Calculation profile name:** Purchased Electricity: Contractual Instrument Based - 2021 - Wide World Importers
  - **Emission source:** Purchased electricity
  - **Activity data to include in calculation:** Organizational Unit equals Wide World Importers AND Quantity Unit equals kWh
  - **Calculation model:** Choose Purchased Electricity: Contractual Instrument Based - 2021 in the dropdown list
  - **Check Schedule Automatically run**
- 4) The fields and their values are **explained** below:
  - 1) The **Calculation profile** name is used for identifying the calculation profile in the list.
  - 2) The **Emission source** is used to identify which activity data type should be used in the calculation.
  - 3) The **Activity data to include filter** is used to filter activity data to a specific subset of the activity data type.

To create the filter perform the following steps:

  - a. Click **Add->Add row**

### Activity data to include in calculation

And ▾

+ Add ▾

+ Add row

Calculat

≡ Add group

⌘ Add related entity

Schedule

- b. In the "Select a field" dropdown, choose **Organizational Unit**



### Activity data to include in calculation

And ▾

☐  ▾

☐  ...

- Modified On
- Name
- Organizational Unit
- Origin correlation ID
- Owner

c. In the "Value" dropdown, choose "**Wide World Importers (Organizational unit)**"

### Activity data to include in calculation

And ▾

☐  ▾  ▾  ▾ 🔍 ...

☐  ▾

Calculation model \*

Schedule

☒ Automatically run this calculation when data is refreshed

- Contoso APAC (Organizational unit)
- Contoso Corp (Organizational unit)
- Contoso EUR (Organizational unit)
- Contoso Kenya (Organizational unit)
- Contoso London (Organizational unit)
- Contoso New York (Organizational unit)
- Contoso Pod Business (Organizational unit)
- Contoso USA (Organizational unit)
- Wide World Importers (Organizational unit)**

d. Click **Add->Add row** again

### Activity data to include in calculation

And ▾

☐  ▾

Calculation model \*

Schedule

- e. In the “Select a field” dropdown, choose “**Quantity unit**”

Activity data to include in calculation

And ▾

☐ Organizational Unit ▾

☐ Select a field ▾

+ Add ▾

Calculation model \*

Schedule

☒ Automatically run this calculation when data is refreshed

Modified By (Delegate)

Modified On

Name

Organizational Unit

Origin correlation ID

Owner

Owning business unit

Partition Id

Purchased energy

Quantity

Quantity unit

- f. In the “Value” dropdown, choose “**kWh**”

Activity data to include in calculation

And ▾

☐ Organizational Unit ▾ Equals ▾ Wide ▾

☐ Quantity unit ▾ Equals ▾ Value ▾

+ Add ▾

kcal (Unit)

kg (Unit)

Km (Unit)

kWh (Unit)

L (Unit)

- 4) The **Calculation model** is used to identify which calculation model should be used for the calculation. **Be sure to choose the Calculation model from the dropdown list.**
- 5) “**Automatically run this calculation when data is refreshed**” is used to automatically trigger calculations when the matching activity data is refreshed.
- 6) The form should resemble the image below, Click “**Next**”

## New calculation profile

- Create
- Preview
- Finish

### Calculation profile set up

ⓘ Be sure you have a calculation model for this profile before continuing. [Create model](#)

**Calculation profile name \***

Purchased Electricity: Contractual Instrument Based - 2021 - Wide World Importers 1

**Description**

**Emissions source \***

Purchased electricity 2

**Activity data to include in calculation**

And ▼

☐ Organizational Unit ▼ Equals ▼ Wide World Importers x ▼ 3

☐ Quantity unit ▼ Equals ▼ kWh x ▼ 3

+ Add ▼

**Calculation model \***

Purchased Electricity: Contractual Instrument Based - 2021 4 +

**Schedule**

☒ Automatically run this calculation when data is refreshed 5

Back Next 6 Cancel

**Note:** Choose the Calculation model from the dropdown list

On the "Preview" page of the New calculation profile wizard the emissions are calculated for the first row of data that matches the Activity data to include filter. **In this scenario, the values seen in the preview may be different than the image below.**

These values were determined by converting the consumed kWh to MWh:  $3519.038 / 1000 = 3.519038$  MWh

The values of emissions gasses are determined by multiplying the converted consumption by each of the greenhouse gas factors from the emission factor (FRCC) determined in the factor mapping:

- CO<sub>2</sub>:  $3.519038 * 861 = 3,029.892$  lb
- CH<sub>4</sub>:  $3.519038 * .055 = 0.194$  lb
- N<sub>2</sub>O:  $3.519038 * .007 = 0.025$  lb

Finally, multiplying the greenhouse gases by their GWP factor (Global Warming Potential) found in the Greenhouse gases table, and adding up the values.

- CO<sub>2</sub>:  $3,029.892 * 1 = 3,029.892$  lb
- CH<sub>4</sub>:  $0.194 * 25 = 4.85$  lb
- N<sub>2</sub>O:  $0.025 * 298 = 7.45$  lb
- CO<sub>2</sub>E:  $3,029.892 + 4.85 + 7.45 = 3,042.19$  lb

**Note:** the values in this by hand demonstration have been rounded to 3 decimal points resulting in a slightly different value. Microsoft Sustainability Manager computes up to 10 decimal points

5) You can click **"Save"** to save your Calculation profile.

## New calculation profile



- ☒ Create
- ☒ Preview
- ☐ Finish

### Preview

Calculation based on the first record of activity data

#### PurchasedElectricity

Purchased electricity

Purchased Electricity: Contractual Instrument Based - 2021

Electricity \* EF (Contractual Instrument Type) | Electricity \* EF (Contractual Instrument Type)

Consumption	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> E
3,519.038 kWh	3,029.892 lb	0.194 lb	0.025 lb	3,042.071 lb
	(861 lb)	(0.055 lb)	(0.007 lb)	—

Back

Save

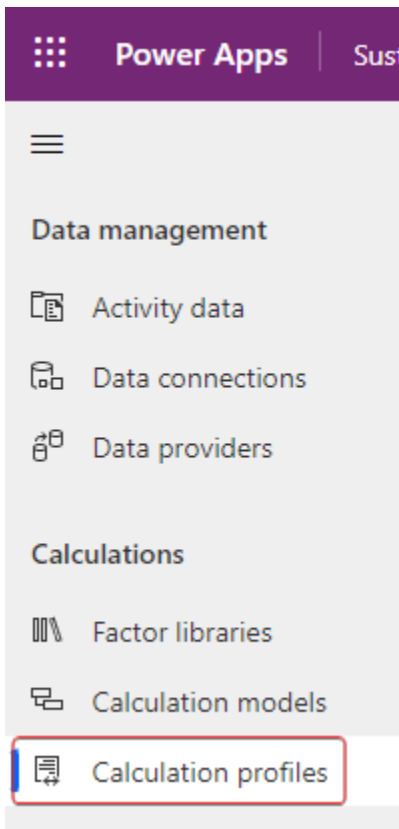
Cancel

Great job, you have created a calculation profile. Calculation profiles are the mechanisms by which Calculation jobs are queued. You can set your Calculation profiles to run automatically when matching Activity Data is added or updated, as we chose in this scenario, or you can run them manually which we will discuss in Task 3 of this exercise. **Please continue to the next task.**

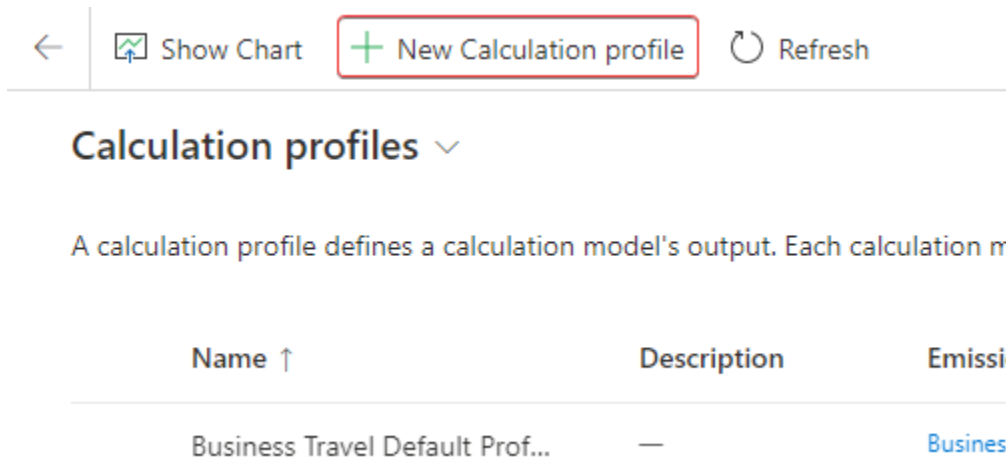
## Task 2: Create Electric Vehicle Miles Driven Calculation Profile

In this task, Alex will create a Calculation Profile for the miles driven by Wide World Importers' fleet of electric vehicles for year 2021. They will use the calculation model defined earlier in this lab and filter the profile to only activity data for the Wide World Importers organizational unit, and where the unit type is mile. These filters will ensure that only the miles driven for Wide World Importers' fleet of electric vehicles is included in the calculation job. This will exclude the purchased electricity, which was covered in the previous task.

1. Navigate to **"Calculation profiles"** on the left side of the page.



2. Click “+New Calculation profile” to create a new Calculation profile

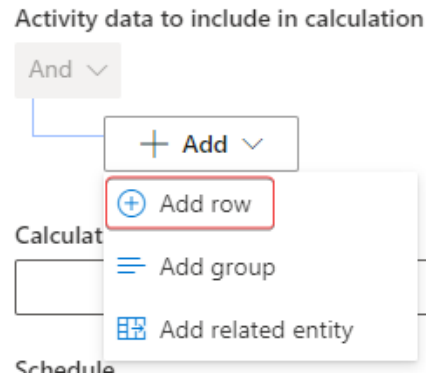


3. Populate the following information on the New calculation profile wizard
  - **Calculation profile name:** Electric Vehicle Miles Driven - 2021
  - **Emission source:** Purchased electricity
  - **Activity data to include in calculation:** Organizational Unit equals Wide World Importers AND Quantity unit equals mile
  - **Calculation model:** Choose Electric Vehicle Miles Driven - 2021 in the dropdown list
  - **Check Schedule Automatically run**
4. The fields and their values are explained below:
  - 1) The **Calculation profile name** is used for identifying the calculation profile in the list.
  - 2) The **Emission source** is used to identify which activity data type should be used in the calculation.

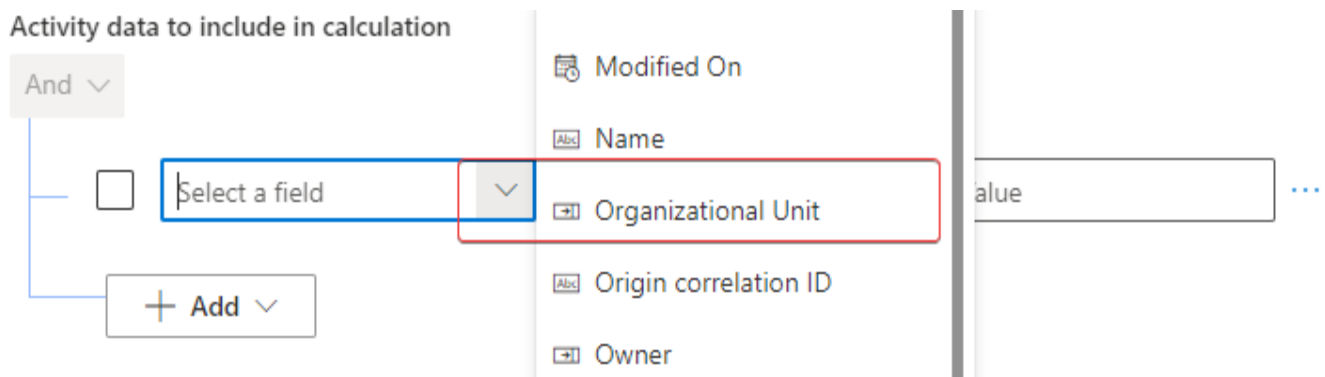
- 3) The **Activity data to include filter** is used to filter activity data to a specific subset of the activity data type.

To create the filter perform the following steps:

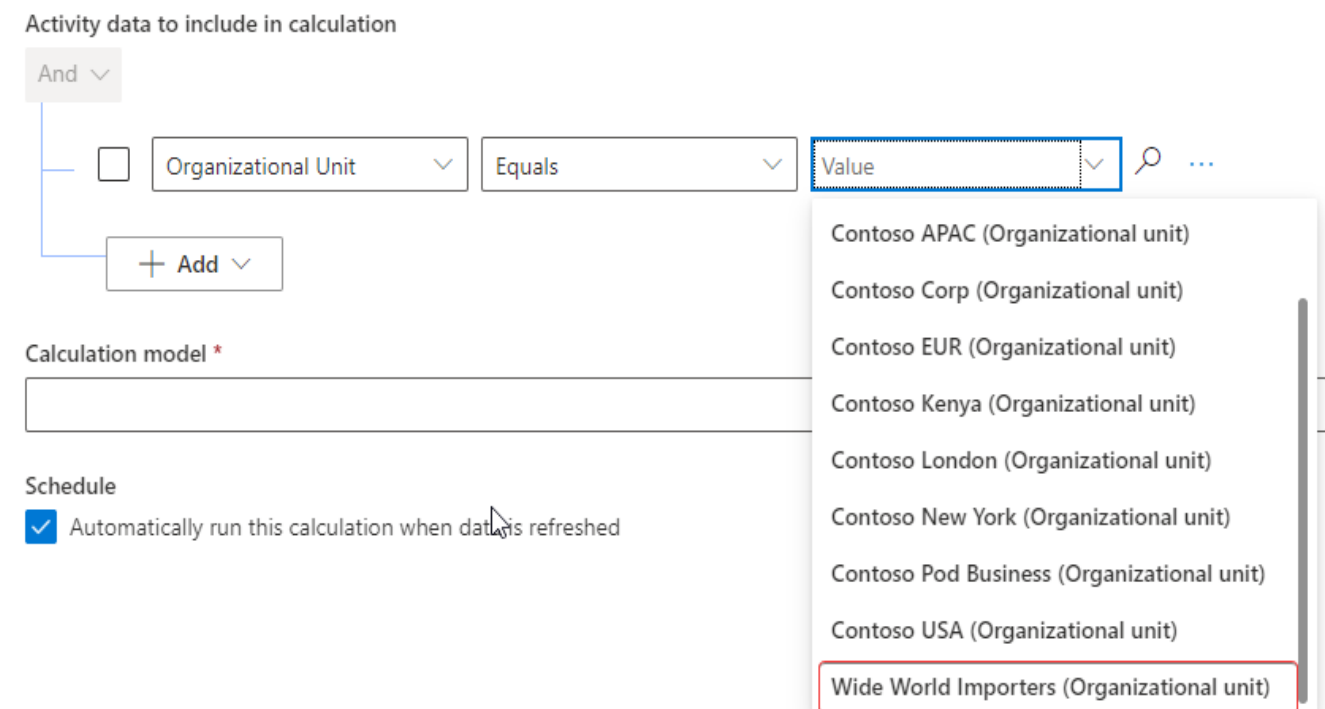
- a. Click **Add->Add row**



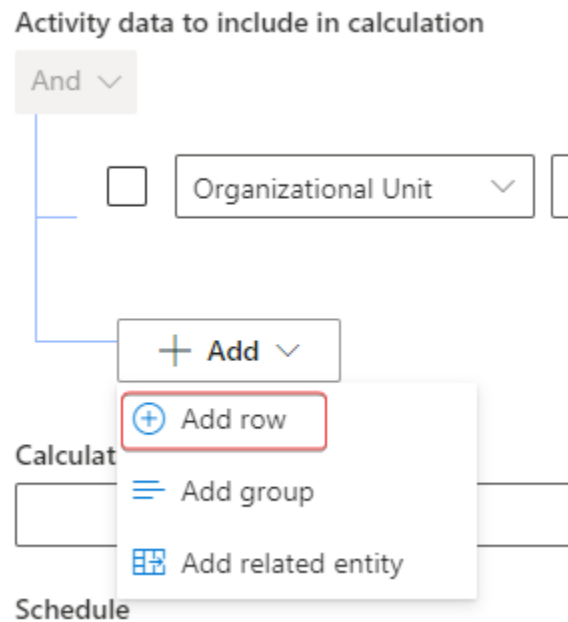
- b. In the "Select a field" dropdown, choose "**Organizational Unit**"



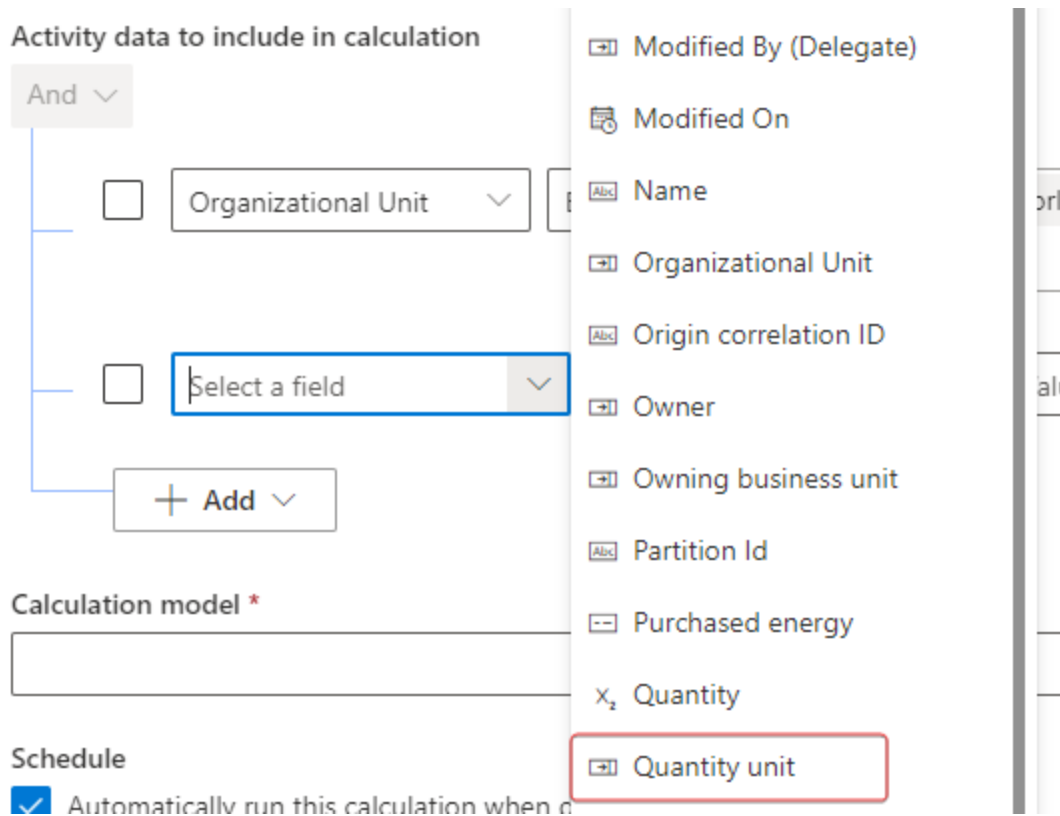
- c. In the "Value" dropdown, choose "**Wide World Importers (Organizational unit)**"



d. Click **Add->Add row** again



e. In the "Select a field" dropdown, choose "**Quantity unit**"



f. In the "Value" dropdown, choose "**mile**"

Activity data to include in calculation

And ▾

☐

Organizational Unit ▾

Equals ▾

Wide World Importers ▾

☐

Quantity unit ▾

Equals ▾

Value ▾

+ Add ▾

m (Unit)  
 metricton (Unit)  
 mi (Unit)  
 mile (Unit)  
 mmBtu (Unit)

- 1) The **Calculation model** is used to identify which calculation model should be used for the calculation. **Be sure to choose the Calculation model from the dropdown list.**
- 2) **"Automatically run this calculation when data is refreshed"** is used to automatically trigger calculations when the matching activity data is refreshed.
- 3) The form should resemble the image below, Click **"Next"**

## New calculation profile

- Create
- Preview
- Finish

### Calculation profile set up

① Be sure you have a calculation model for this profile before continuing. [Create model](#)

Calculation profile name \*

Electric Vehicle Miles Driven - 2021

Description

Emissions source \*

Purchased electricity

Activity data to include in calculation

And ▾

☐

Organizational Unit ▾

Equals ▾

Wide World Importers ▾

☐

Quantity unit ▾

Equals ▾

mile ▾

+ Add ▾

Calculation model \*

Electric Vehicle Miles Driven - 2021

Schedule

☒ Automatically run this calculation when data is refreshed

Back

Next

Cancel

**Note:** Choose the Calculation model from the dropdown list



On the "Preview" page of the New calculation profile wizard you will see the emissions calculated for the first row of data that matches your Activity data to include filter. **In this scenario, the values seen in the preview may be different than the image below.**

These values were determined by converting the miles driven to kWh:  $(7484.724 / 100) * 49 = 3667.515$  kWh

The consumed kWh converted to MWh:  $3667.515 / 1000 = 3.667515$  MWh

Multiplying the converted consumption by each of the greenhouse gas factors from the emission factor (FRCC) determined in the factor mapping:

- CO<sub>2</sub>:  $3.667515 * 861 = 3,001.127$  lb
- CH<sub>4</sub>:  $3.667515 * .055 = 0.238$  lb
- N<sub>2</sub>O:  $3.667515 * .007 = 0.033$  lb

Finally, multiplying the greenhouse gases by their GWP factor (Global Warming Potential) found in the Greenhouse gases table, and adding up the values.

- CO<sub>2</sub>:  $3,001.127 * 1 = 3,001.127$  lb
- CH<sub>4</sub>:  $0.238 * 25 = 5.95$  lb
- N<sub>2</sub>O:  $0.033 * 298 = 9.834$  lb
- CO<sub>2</sub>E:  $3,001.127 + 5.95 + 9.834 = 3,016.911$  lb

**Note:** the values in this by hand demonstration have been rounded to 3 decimal points resulting in a slightly different value. Microsoft Sustainability Manager computes up to 10 decimal points

You can click "**Save**" to save your Calculation profile.

New calculation profile

Create

Preview

Finish

Preview

Calculation based on the first record of activity data

Fleet Vehicle 45

Purchased electricity

Electric Vehicle Miles Driven - 2021

kWh \* EF | kWh \* EF

Consumption	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> E
3,667.515 kWh	3,001.127 lb	0.238 lb	0.033 lb	3,016.923 lb
	(818.3 lb)	(0.065 lb)	(0.009 lb)	—

Back

Save

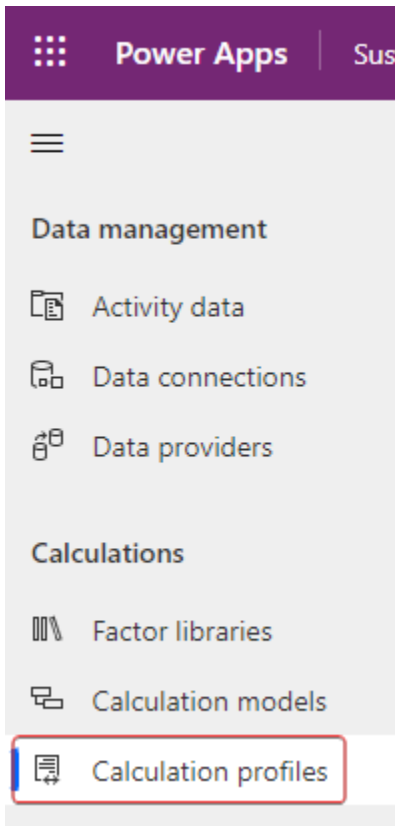
Cancel

Great job, you have created a calculation profile. Calculation profiles are the mechanisms by which Calculation jobs are queued. You can set your Calculation profiles to run automatically when matching Activity Data is added or updated, as we chose in this scenario, or you can run them manually which we will discuss in Task 3 of this exercise. **Please continue to the next task.**

### Task 3: Run Calculation Profiles

In this task, Alex will run the newly created Calculation Profiles for the electricity purchased by Wide World Importers and miles driven by Wide World Importers fleet of electric vehicles. This will create a calculation job that will iterate over each activity data row matching the Calculation Profile filter criteria and use the Calculation Models created earlier in this lab to calculate the carbon emissions for each row. The results will be placed in the emissions table, which Alex will review once the calculations complete.

1. Navigate to "**Calculation profiles**" on the left side of the page.



2. To run the calculation profile for Purchased Electricity: Contractual Instrument Type - 2021:
  - 1) Select **Purchased Electricity: Contractual Instrument Type - 2021** in the list
  - 2) Click **Run calculation** on the command bar

← Show Chart + New Calculation profile Edit Delete ▶ Run calculation Refresh

2

Calculation profiles ▾ Edit columns Edit filters Search this view 🔍

A calculation profile defines a calculation model's output. Each calculation model can have more than one profile, giving you multiple ways to view its output. [Learn more about calculation profiles](#) List ▾

Name ↑	Description	Emissions source	Created by	Last run	Processed activities	Failed activities	Status	Hi
Business Travel Default Prof...	—	Business travel		—	—	—	—	His
Capital Goods Default Profile	—	Capital goods		—	—	—	—	His
Downstream Transportatio...	—	Downstream transportation and di		—	—	—	—	His
Electric Vehicle Miles Drive...	—	Purchased electricity		—	—	—	—	His
Fugitive Emissions Default ...	—	Fugitive emissions		—	—	—	—	His
Mobile Combustion Defaul...	—	Mobile combustion		—	—	—	—	His
Purchased Cooling Default ...	—	Purchased cooling		—	—	—	—	His
Purchased Electricity Defau...	—	Purchased electricity		—	—	—	—	His
1 ✓ Purchased Electricity: Cont...	—	Purchased electricity		—	—	—	—	His

3. To run the calculation profile for Electric Vehicle Miles Driven - 2021:

- 1) Select **Electric Vehicle Miles Driven - 2021** in the list
- 2) Click **Run calculation** on the command bar

← Show Chart + New Calculation profile Edit Delete ▶ Run calculation Refresh

2

Calculation profiles ▾ Edit columns Edit filters Search this view 🔍

A calculation profile defines a calculation model's output. Each calculation profile can have more than one profile, giving you multiple ways to view its output. [Learn more about calculation profiles](#) List ▾

Name ↑	Description	Emissions source	Created by	Last run	Processed activities	Failed activities	Status	Hi
Business Travel Default Prof...	—	Business travel		—	—	—	—	His
Capital Goods Default Profile	—	Capital goods		—	—	—	—	His
Downstream Transportatio...	—	Downstream transportation and di		—	—	—	—	His
1 ✓ Electric Vehicle Miles Driv...	—	Purchased electricity		—	—	—	—	His
Fugitive Emissions Default ...	—	Fugitive emissions		—	—	—	—	His
Mobile Combustion Defaul...	—	Mobile combustion		—	—	—	—	His
Purchased Cooling Default ...	—	Purchased cooling		—	—	—	—	His
Purchased Electricity Defau...	—	Purchased electricity		—	—	—	—	His
Purchased Electricity: Contr...	—	Purchased electricity		—	—	—	Created	His

4. After several minutes (approximately 6 minutes) both calculation jobs should be completed. Alex clicks the **"Refresh"** button on the command bar to check the status of the calculation jobs. The two Calculation profiles should now have a status of **"Succeeded"**.

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SANDBOX

← Show Chart + New Calculation profile Refresh

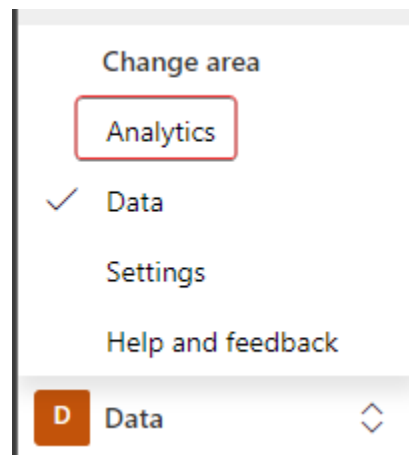
Calculation profiles

A calculation profile defines a calculation model's output. Each calculation model can have more than one profile, giving you multiple ways to view its output. [Learn more about calculation profiles](#)

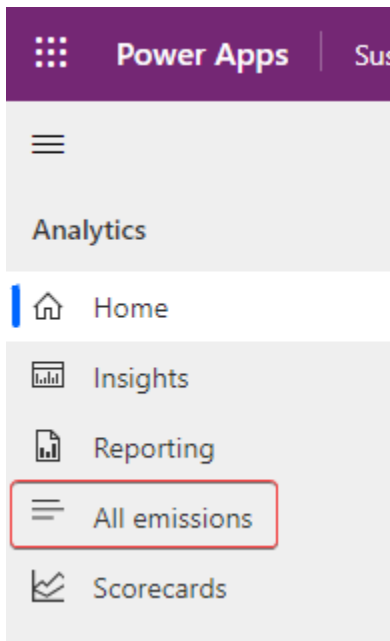
Name ↑	Description	Emissions source	Created by	Last run	Processed activities	Failed activities	Status	
Business Travel Default Prof...	—	Business travel		—	—	—	—	His
Capital Goods Default Profile	—	Capital goods		—	—	—	—	His
Downstream Transportatio...	—	Downstream transportation and di		—	—	—	—	His
Electric Vehicle Miles Drive...	—	Purchased electricity		9/7/2022 5:22 PM	480	0	● Succeeded	His
Fugitive Emissions Default ...	—	Fugitive emissions		—	—	—	—	His
Mobile Combustion Defaul...	—	Mobile combustion		—	—	—	—	His
Purchased Cooling Defaul...	—	Purchased cooling		—	—	—	—	His
Purchased Electricity Defau...	—	Purchased electricity		—	—	—	—	His
Purchased Electricity; Contr...	—	Purchased electricity		8/11/2022 7:23 P...	24	0	● Succeeded	His
Purchased Goods and Servi...	—	Purchased goods and services...		—	—	—	—	His
Purchased Heat Default Pr...	—	Purchased heat		—	—	—	—	His
Purchased Renewables Def...	—	Purchased electricity		—	—	—	—	His
Stationary Combustion Fue...	—	Stationary combustion		—	—	—	—	His
Stationary Combustion HH...	—	Stationary combustion		—	—	—	—	His
Upstream Transportation a...	—	Upstream transportation and distri		—	—	—	—	His

D Data

5. In the bottom left corner, change the Area to **Analytics**



6. Navigate to **"All emissions"** on the left side of the page.



7. The All emissions view shows all emissions that have been calculated or directly imported

Power Apps Sustainability Manager SANDBOX

Analytics

Home

Insights

Reporting

All emissions

Scorecards

All emissions

Edit columns

Edit filters

Search this view

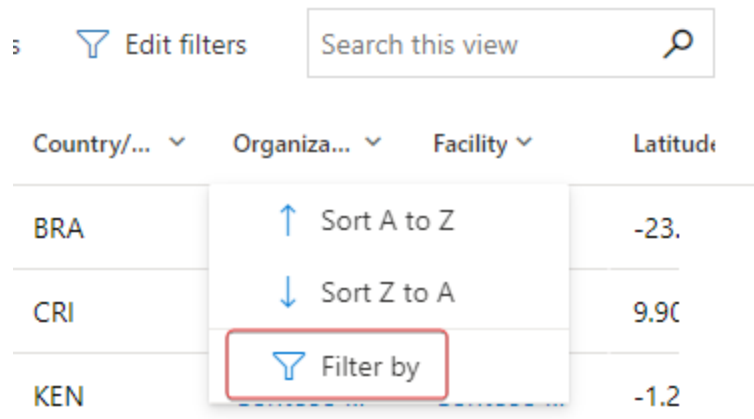
Name	Scope	Emissions...	Activity L...	Calculatio...	Transacti...	Consump...	Consump...	Country/...	Organizat...	Facility	Latitude
Truck transport	Scope 3	Upstream...	Medium...	5/14/2022	10/31/20...	10/1/2021	10/31/20...	BRA	Contoso ...	Contoso ...	-23.
Heating Invoices	Scope 2	Purchase...	Heating	5/14/2022	6/1/2020	6/1/2020	6/30/2020	CRI	Contoso ...	Contoso ...	9.9C
Product Showcase Tour - 42301	Scope 3	Business ...	Hotel	5/14/2022	3/24/2019	2/25/2019	3/4/2019	KEN	Contoso ...	Contoso ...	-1.2
Product Showcase Tour - 22332	Scope 3	Business ...	Transit rail	5/14/2022	6/19/2019	5/27/2019	5/30/2019	CHE	Contoso ...	Contoso ...	46.5
Onsite Motor Gasoline Combustion	Scope 1	Stationar...	Petroleu...	5/14/2022	1/1/2020	12/31/20...	12/1/2019	ETH	Contoso ...	Contoso ...	9.0C
Diesel Fuel	Scope 1	Industrial...	Chemical ...	4/25/2022	8/1/2020	8/1/2020	8/31/2020		Contoso ...	Contoso ...	
Sydney Fleet 1	Scope 1	Mobile c...	Gasoline ...	5/14/2022	12/1/2019	12/1/2019	12/31/20...	AUS	Contoso ...	Contoso ...	-33.
Heating Invoices	Scope 2	Purchase...	Heating	5/14/2022	7/1/2019	7/1/2019	7/31/2019	CRI	Contoso ...	Contoso ...	9.9C
Product Showcase Tour - 42260	Scope 3	Business ...	Hotel	5/14/2022	2/26/2019	1/24/2019	2/6/2019	KEN	Contoso ...	Contoso ...	-1.2
Company Cooling	Scope 2	Purchase...	Cooling	5/14/2022	4/1/2018	3/1/2018	3/31/2018	JPN	Contoso ...	Contoso ...	35.6
Product Showcase Tour - 32284	Scope 3	Business ...	Bus	5/14/2022	6/14/2019	5/25/2019	5/25/2019	GBR	Contoso ...	Contoso ...	51.1
PurchasedRenewableElectricity	Scope 2	Purchase...	Electricity	5/14/2022	1/1/2020	1/1/2020	1/31/2020	CHE	Contoso ...	Contoso ...	46.5
Green fleet 2	Scope 1	Mobile c...	Light-Dut...	5/14/2022	7/1/2021	7/1/2021	7/31/2021	AUS	Contoso ...	Contoso ...	-33.
Heating Invoices	Scope 2	Purchase...	Heating	5/14/2022	10/1/2018	10/1/2018	10/31/20...	CRI	Contoso ...	Contoso ...	9.9C
Manufacturing line supplies	Scope 3	Purchase...	Miscellan...	5/14/2022	3/1/2020	3/1/2020	3/1/2020	AUS	Contoso ...	Contoso ...	-33.
London Fleet 1	Scope 1	Mobile c...	Gasoline ...	5/14/2022	9/1/2018	9/1/2018	9/30/2018	GBR	Contoso ...	Contoso ...	51.1

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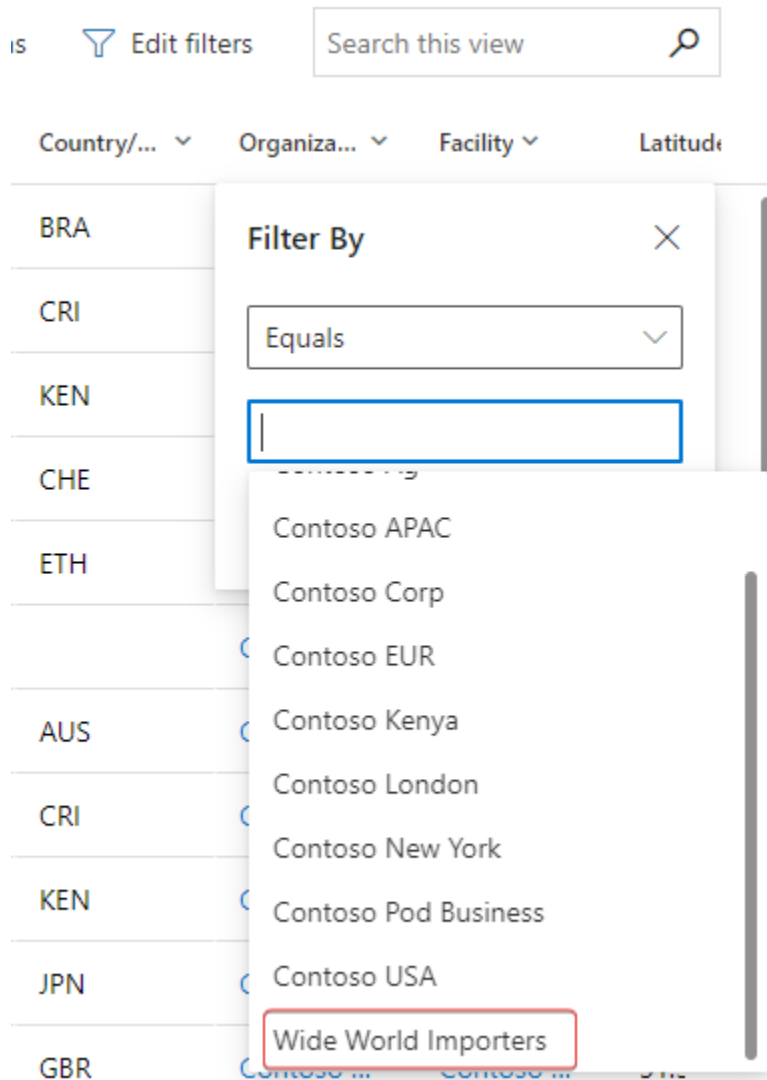
Take a tour

Page 1

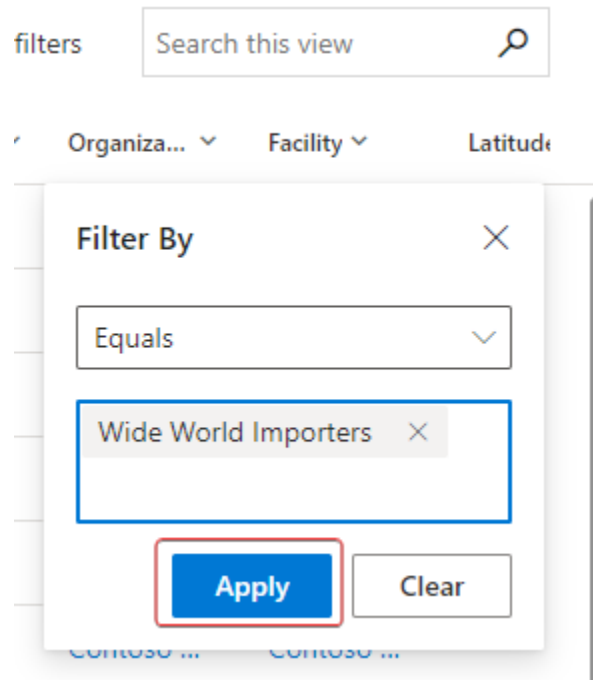
8. Filter the view by clicking the down arrow next to the **Organizational Unit** column, and selecting **Filter by**



9. Select "**Wide World Importers**" from the Filter By dialog



10. Click **Apply** to apply the filter to the column



- After a few moments, the view will refresh, and the calculated emissions data for each of the activity data records imported in previous labs will be shown. Scroll to the right to see the CO<sub>2</sub>E carbon emission values.

Power Apps | Sustainability Manager | **SANDBOX**

Analytics | Home | Insights | Reporting | All emissions | Scorecards

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Take a tour

Country/...	Organi...	Facility	Latitude	Longitude	CH <sub>4</sub>	CH <sub>4</sub> unit	CO <sub>2</sub>	CO <sub>2</sub> unit	N <sub>2</sub> O	N <sub>2</sub> O unit	CO <sub>2</sub> E	CO <sub>2</sub> E unit	CO <sub>2</sub> E (mt)
USA	Wide Wo...	Wide Wo...	25.75572...	-80.1962...	0.212229...	lb	3.322.360...	lb	0.027011...	lb	3.335.715...	lb	1.513047..
USA	Wide Wo...	Wide Wo...	25.75572...	-80.1962...	0.203966...	lb	2.567.782...	lb	0.028241...	lb	2.581.297...	lb	1.170850..
USA	Wide Wo...	Wide Wo...	25.75572...	-80.1962...	0.215271...	lb	2.710.101...	lb	0.029806...	lb	2.724.365...	lb	1.235745..
USA	Wide Wo...	Wide Wo...	25.75572...	-80.1962...	0.135993...	lb	1.712.053...	lb	0.018829...	lb	1.721.065...	lb	0.780657..
USA	Wide Wo...	Wide Wo...	25.75572...	-80.1962...	0.286888...	lb	3.611.701...	lb	0.039722...	lb	3.630.711...	lb	1.646854..
USA	Wide Wo...	Wide Wo...	25.75572...	-80.1962...	0.216006...	lb	2.719.355...	lb	0.029908...	lb	2.733.668...	lb	1.239964..
USA	Wide Wo...	Wide Wo...	27.94483...	-82.5140...	0.349729...	lb	4.402.822...	lb	0.048424...	lb	4.425.996...	lb	2.007587..
USA	Wide Wo...	Wide Wo...	25.75572...	-80.1962...	0.286878...	lb	3.611.581...	lb	0.039721...	lb	3.630.590...	lb	1.646799..
USA	Wide Wo...	Wide Wo...	25.75572...	-80.1962...	0.211833...	lb	2.666.822...	lb	0.029330...	lb	2.680.859...	lb	1.216010..
USA	Wide Wo...	Wide Wo...	27.94483...	-82.5140...	0.238137...	lb	2.997.963...	lb	0.032972...	lb	3.013.742...	lb	1.367003..
USA	Wide Wo...	Wide Wo...	27.94483...	-82.5140...	0.510466...	lb	6.426.378...	lb	0.070679...	lb	6.460.203...	lb	2.930283..
USA	Wide Wo...	Wide Wo...	25.75572...	-80.1962...	0.174863...	lb	2.201.402...	lb	0.024211...	lb	2.212.989...	lb	1.003789..
USA	Wide Wo...	Wide Wo...	27.94483...	-82.5140...	0.448343...	lb	5.644.305...	lb	0.062078...	lb	5.674.013...	lb	2.573675..
USA	Wide Wo...	Wide Wo...	25.75572...	-80.1962...	0.099888...	lb	1.257.515...	lb	0.013830...	lb	1.264.134...	lb	0.573398..
USA	Wide Wo...	Wide Wo...	27.94483...	-82.5140...	0.336245...	lb	4.233.068...	lb	0.046557...	lb	4.255.348...	lb	1.930183..
USA	Wide Wo...	Wide Wo...	25.75572...	-80.1962...	0.368719...	lb	4.641.892...	lb	0.051053...	lb	4.666.324...	lb	2.116597..

**Congratulations!** You have created and run Calculation profiles. Calculation profiles are the final step in calculating and recording your carbon emissions in Microsoft Cloud for Sustainability. From here you will be able to Report and Reduce your carbon emissions, which we will discuss in the next labs. It may take 30 minutes for your emissions to appear in the Reporting areas.