



THE UNIVERSITY OF BRITISH COLUMBIA



ENGR 544, Life Cycle Assessment and Management  
School of Engineering, Faculty of Applied Science  
The University of British Columbia (Okanagan)

# Learning Objectives

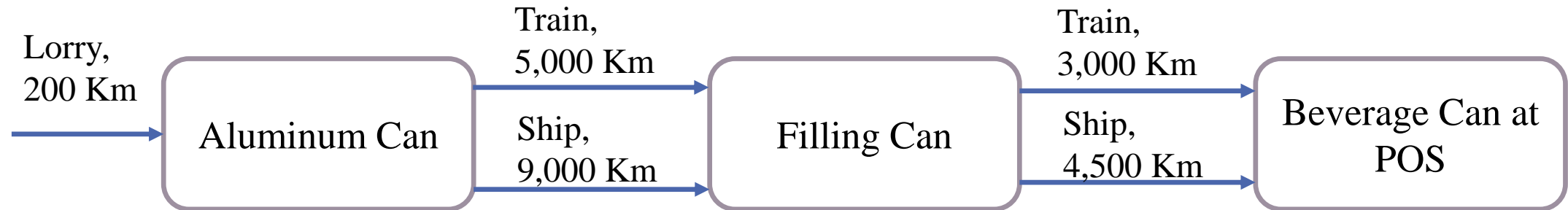
- **Create multiple** processes and product systems in openLCA.
- Analyse and **compare multiple** processes and product systems in openLCA.
- Analyse and **compare multiple scenarios** for product systems in openLCA.
- Interpret the results of comparison.



# Aluminum Beverage Can Production

❖ There are two scenarios;

1. Transporting Aluminum Can by Train.
2. Transporting Aluminum Can by Ship.





# Life Cycle Analysis

- How do you define the goal of this study?
- What is the scope of this study?
- What is the limitation of this study?
- What LCIA method do you apply?



Create Flows

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# Create Flows

❑ Right click on Flows and create a new child category called ‘**Alu. Beverage Can Production Scenarios**’. Then, create the following flows:

➤ **Alu. Can**

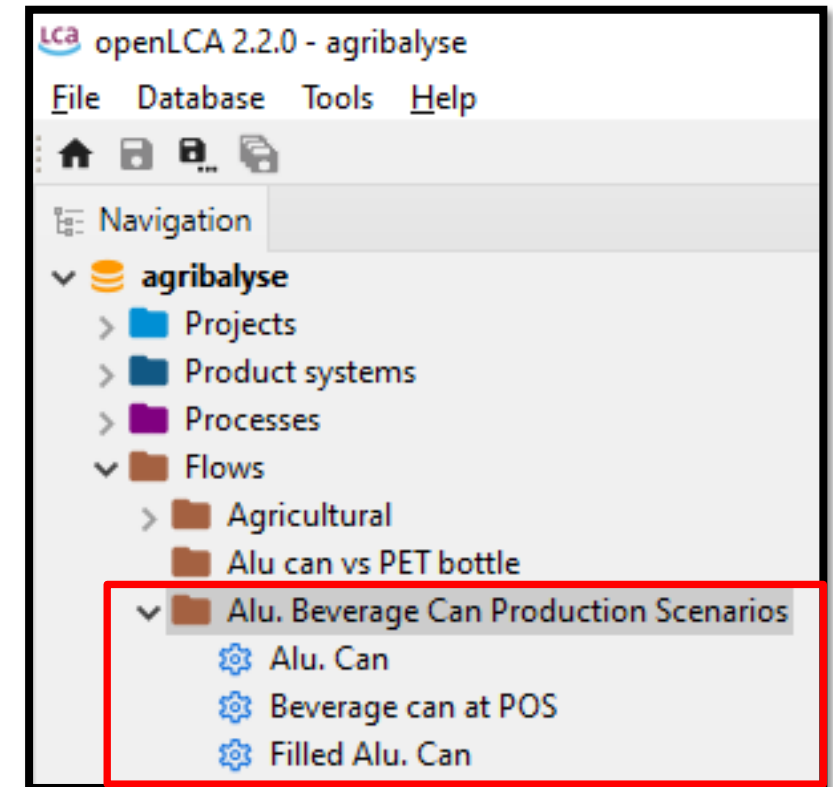
- Flow type (product); Flow properties (number of items);

➤ **Filled Alu. Can**

- Flow type (product); Flow properties (number of items);

➤ **Beverage can at POS**

- Flow type (Product); Flow properties (number of items);



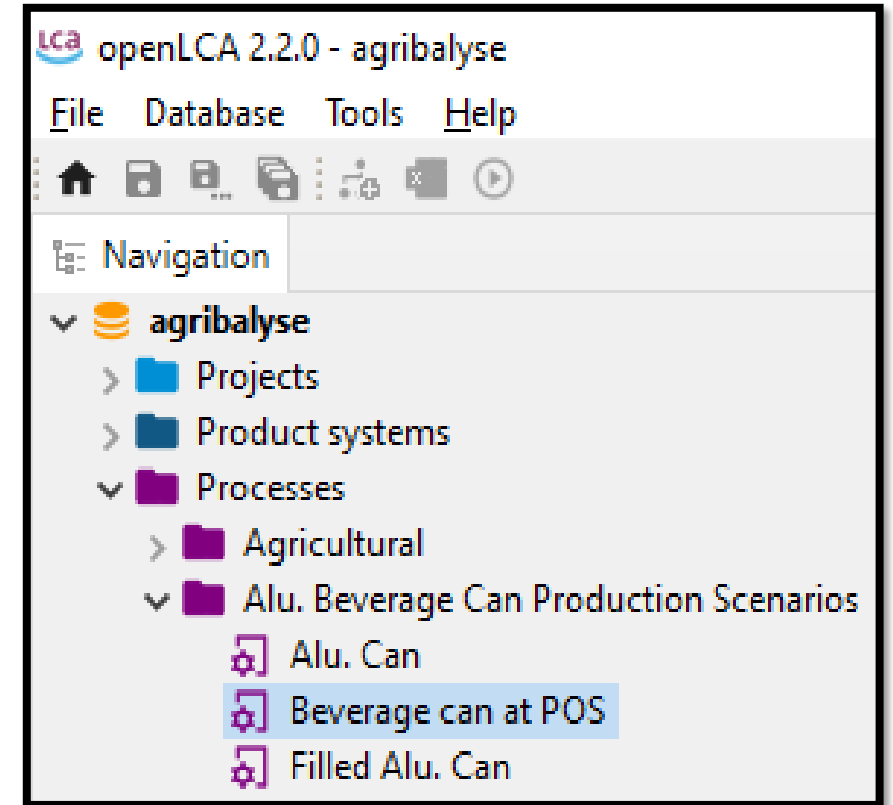
## Create Processes for Multiple Scenarios

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# Create Processes

- ❑ Right click on Processes and create a new child category called ‘Alu. Beverage Can Production Scenarios’. Then, create the following processes:

- Alu. Can
  - Quantitative reference (Alu. Can).
- Filled Alu. Can
  - Quantitative reference (Filled Alu. Can).
- Beverage can at POS
  - Quantitative reference (Beverage can at POS).





## Alu. Can

[illegible]

## Filling Alu. Can

[illegible]

**P Parameters: Filling Alu. Can**

- ▶ **Global parameters**
- ▼ **Input parameters**

| Name     | Value |
|----------|-------|
| Ship_D1  | 1.0   |
| Train_D1 | 1.0   |

# Bottle Filling

[illegible]

**P Parameters: Beverage can at POS**

### ► Global parameters

#### ▼ Input parameters

| Name     | Value | Uncertainty |
|----------|-------|-------------|
| Ship_D2  | 1.0   | none        |
| Train_D2 | 1.0   | none        |

Create Product Systems

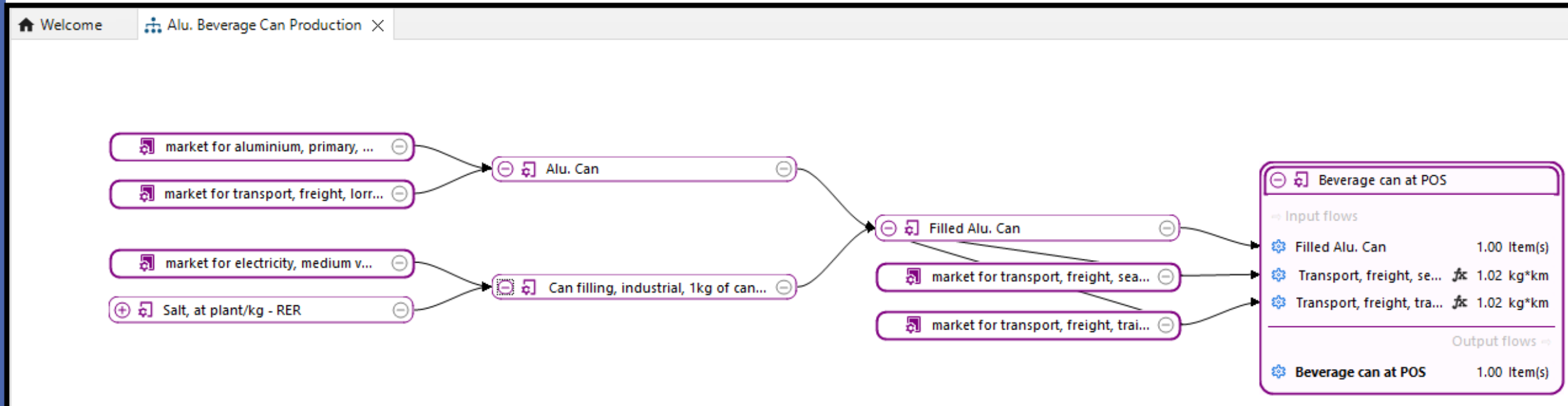
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# Create Product Systems

❑ Right click on Product systems and create a new child category called ‘[Alu. Beverage Can Production Scenarios](#)’. Then, open the process “Beverage can at POS” and click on “Create Product System ” to create a new product system:

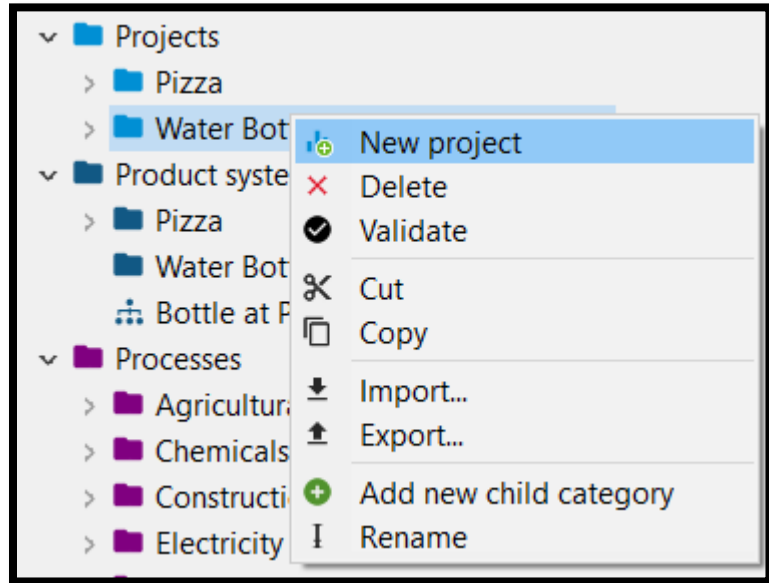
- Name: [Alu. Beverage Can Production](#)
- Reference process: [Beverage can at POS](#)
- To connect the upstream chain, ensure ‘[Auto-link processes](#)’ are checked.
- Preferred process type: [Unit process](#).
- Click the '[Finish](#)' button.

# Alu. Beverage Can Production





# Creating a Project



**Project setup: Alu. Beverage Can Production Scenarios**

General information

**New project**  
Creates a new project

Name: Alu. Beverage Can Production

Description:

Cancel Finish

LCIA Method: CML-IA baseline

Normalization and weighting set:

# Calculating a Project

Welcome

Alu. Beverage Can Production

Name

Alu. Beverage Can Production

Category

Alu. Beverage Can Production

Description

Version

00.00.002

Last change

2024-07-15 16:00:31

UUID

c0d97cd7-2331-446d-8d43-31e16c33683a

Tags

Add a tag

Calculate

Calculation setup

Impact assessment method

CML-IA baseline

Normalization and weighting set

Regionalized LCIA

Include cost calculation

Create report

Compared product systems

| Name             | Product system          | Display                             | Allocation method | Flow                | Amount | Unit    |
|------------------|-------------------------|-------------------------------------|-------------------|---------------------|--------|---------|
| Scenario_1_Train | Alu. Beverage Can Pr... | <input checked="" type="checkbox"/> | None              | Beverage can at POS | 1000.0 | Item(s) |
| Scenario_2_Ship  | Alu. Beverage Can Pr... | <input checked="" type="checkbox"/> | None              | Beverage can at POS | 1000.0 | Item(s) |
|                  |                         |                                     |                   |                     |        |         |
|                  |                         |                                     |                   |                     |        |         |
|                  |                         |                                     |                   |                     |        |         |

Parameters

| Parameter | Context             | Description | Scenario_1_Train | Scenario_2_Ship |
|-----------|---------------------|-------------|------------------|-----------------|
| Ship_D1   | Filled Alu. Can     |             | 0.0              | 9000.0          |
| Ship_D2   | Beverage can at POS |             | 0.0              | 4500.0          |
| Train_D1  | Filled Alu. Can     |             | 5000.0           | 0.0             |
| Train_D2  | Beverage can at POS |             | 3000.0           | 0.0             |

## Class Participation 13:

Open the Report sections and answer the following questions.

- Which case has the highest impact on acidification?
- Which case has the highest impact on global warming?
- Which case has the highest impact on human toxicity?
- Which case has the highest impact on ozone layer depletion?

