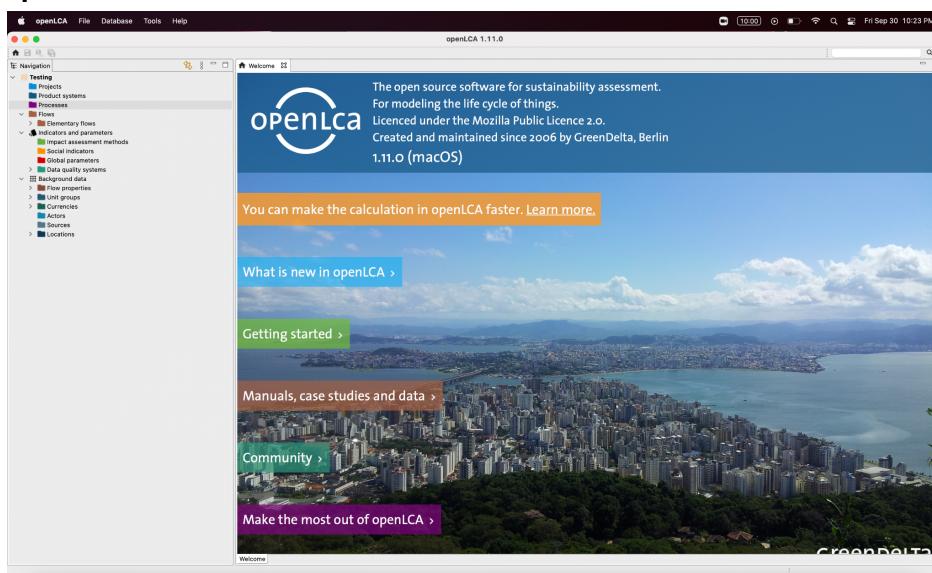


Identifying the Problems with the Current System

The following issues have been extracted from our observations with three different users. During our observation, we made sure to note down, record, and review our sessions. The subjects were given the same scenario outline, which is a common use case of openLCA and was a fair choice. We have presented descriptions as well as potential solutions for each issue found. The solutions are just a summary of what a potential feature or workaround may look like.

openLCA 1.11.0 macOS Welcome Screen:



Problems with Current System faced by Subject 1:

Database Import

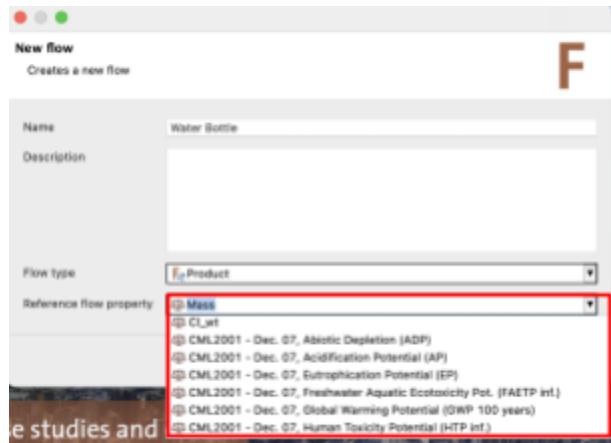
- Issue: Subject 1 had problems locating the “Import” Database button when importing a database. He ignored the “Restore” database and tried finding for “import”. In reality, the “restore” was the “import”

Solution: Rename “restore database” from the options to “import” database
Also, cut down the many ways of importing a database
 - From File > Import data from the new database into an empty project
 - Right click on navbar > import DB
 - Menu bar import DB
- Issue: After importing a .zolka database file, the user must double click it in the navigation window, for it to be restructured and appear properly

Solution: Simply import the database like it should be, without the need for an extra double-click

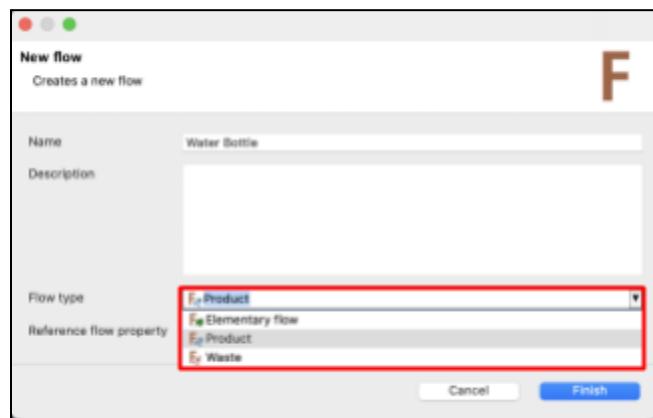
3. Issue: Subject 1 had to scroll through many “Reference flow properties” to find the one desired one

Solution: Find a search button / or another method of finding it instead of a drop-down



4. Issue: Subject 1 was confused about the 3 different “Flow Types”

Solution: Give information on the 3 types of flow, maybe when hovering over them, or some info pop-up

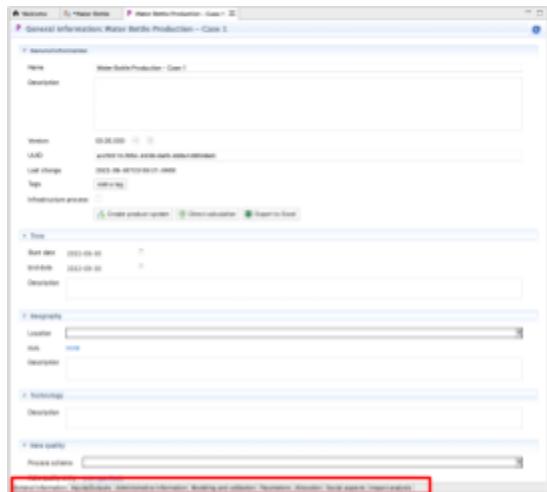


5. Issue: The subject tried saving Flow config changes by doing CTRL + S and it didn't work

Solution: Add CTRL + S as a keyboard input command

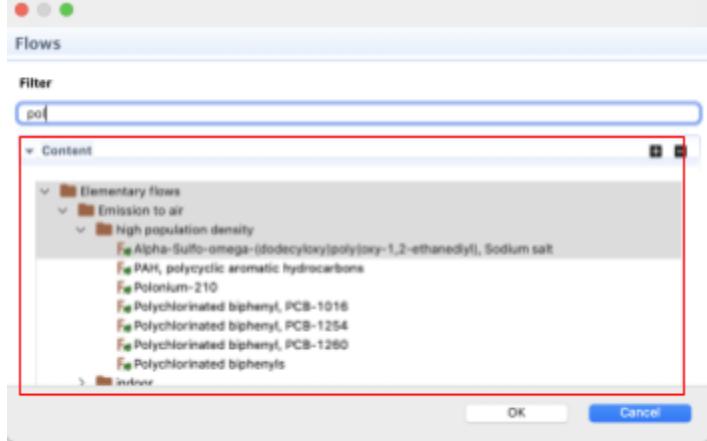
6. Issue: The layout of the Process Config UI is unintuitive, where the Process config tabs are at the bottom

Solution: Place the tabs at the top beneath the files tab



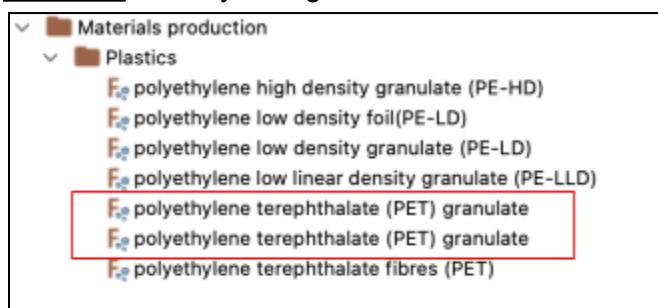
7. **Issue:** When adding Input Flow, the filtering mechanism and the popup are poorly designed. Can't scroll in the inner window of Content, and have to open sub windows
Solution: Add a better search option to go through the different flows, change the layout

_____ Had a better decision option to go through the different news, change the layout.



8. Issue: Similar Flows shown together, “Same directory as well”, No difference

Solution: Possibly, a bug, remove it.



9. **Issue:** After adding the Flow import, it doesn't appear in the sheet, until the width is adjusted. Perhaps, it doesn't update and needs some sort of action to show up

Solution: Another possible bug, try updating the sheet as soon as there is an import

Flow	Category	Amount Unit
F ₂ polyethylene terephthalate (PE... 	Materials production/Pla...	1.00000 kg

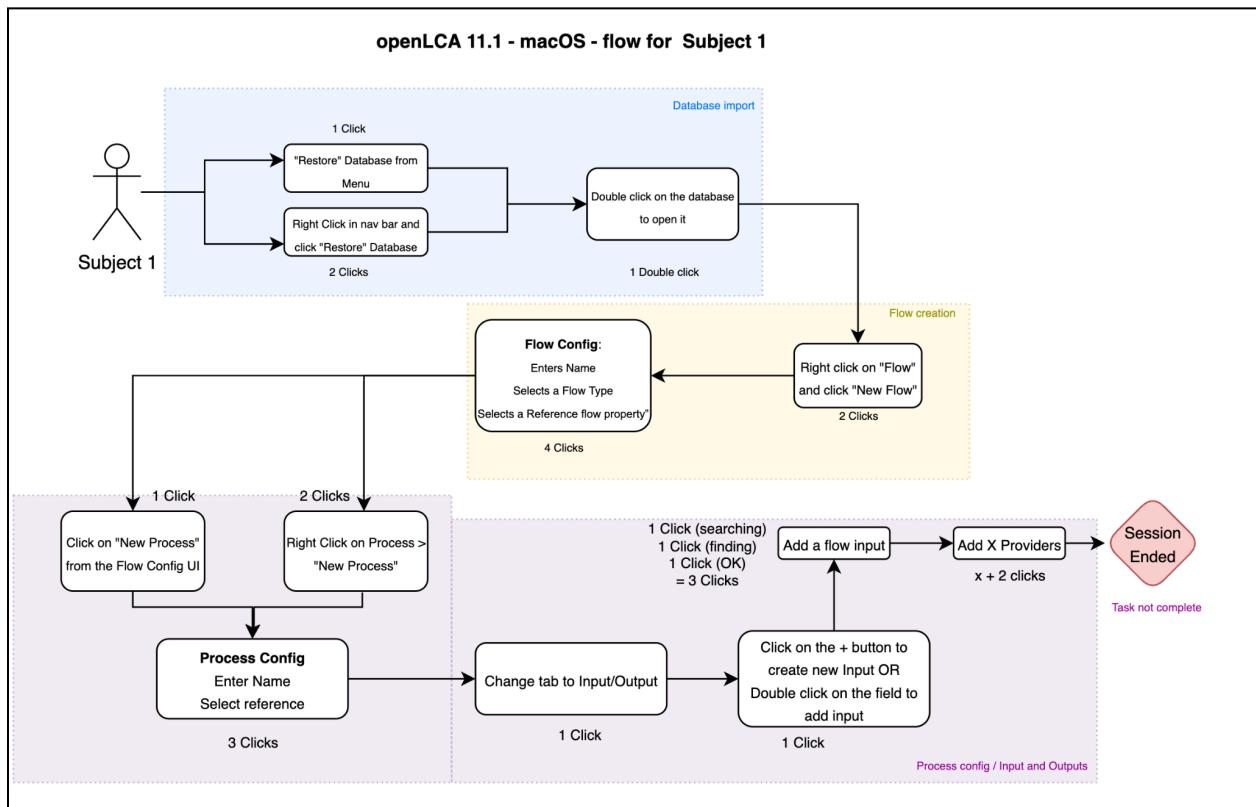
10. Issue: The amounts drop down only have letters, it should tell the name of the unit
Solution: Add the names in a bracket next to them, or on hover

Amount	Unit	Costs/Revenue	Uncertain
1.00000	kg		none
	cg		
	ct		
	cwt		
	diag		
	dg		
	dr (Av)		
	dwt		
	g		
	gr		
	hg		
	kg		
	kg SWU		
	kt		
	lb av		
	long tn		
	mg		
	Mg		
	Mt		
	ng		
	oz av		
	oz t		
	pg		
	u		

Note:

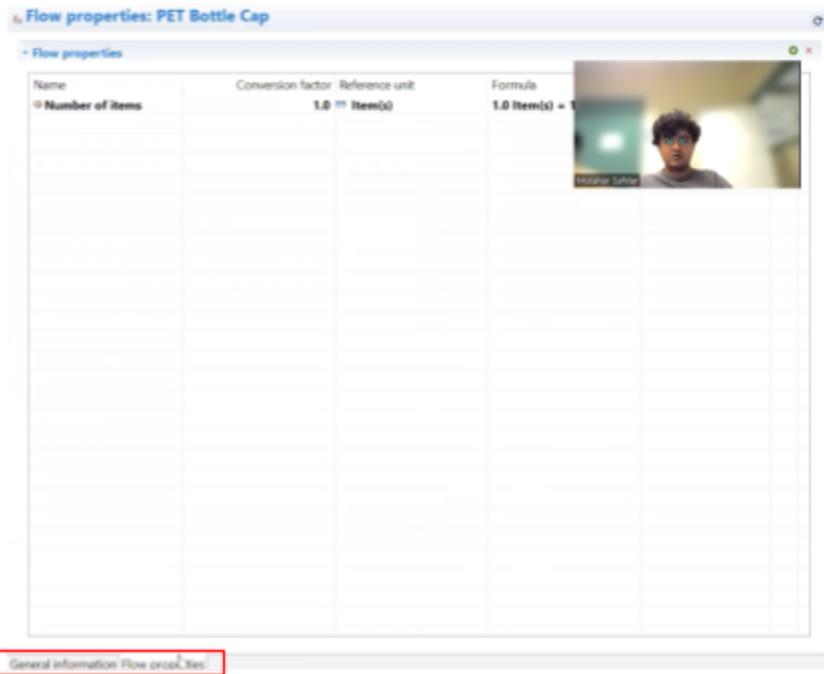
The screenshot shows two windows side-by-side. The left window is titled 'New process' and contains fields for 'Name' (with a placeholder 'P') and 'Quantitative reference'. Below these are two buttons: 'Create a waste treatment process' and 'Create a new flow for the process (as quantitative reference)'. A sidebar lists various industry categories. The right window is also titled 'New process' and has a required field 'Please enter a name' with 'Water Bottle' typed in. It includes a timestamp '00.00.002 491bc5ec-5284-4975-a 2022-09-30T23:23:44.0' and a date/time selector. Buttons for 'Add a tag', 'Product', and 'Create process' are visible. The sidebar on the right also lists categories, with 'Water Bottle' highlighted.

Fig: New Process Config window from “Process”>Right click> New Process VS Config window from “New Process” from Flow config file



Problems with Current System faced by Subject 2:

11. **Issue:** No way of ending the import DB process when it takes too long. Close buttons don't respond. Subjects usually tend to wait first, and then kill the process using task manager.
Solution: When the database import is “stuck” and taking longer than a threshold, terminate the process automatically and inform the user about this error.
12. **Issue:** Bloated view of Flow configuration view. Two different tabs cause confusion.
Solution: Merge the two tabs into the General Information tab.



General information: Flow circulates

13. Issue: The inputs and outputs need to have the same Amount. If they're not the same, the tool is expected to act differently (or be inaccurate). The software does not inform the user about this. // According to Subject 2 and Youtube instructor
Solution: Add some sort of logic that calculates to see if the amounts are the same. If they're not, give the user some sort of feedback.

Inputs/Outputs: Plastic Component Production

Inputs		Amount	Unit	Costs/R...	Uncertai...	Avoide...	Provider	Data qu...	Desc
Flow	Category								
↳ polyethylene terephthalate (PET)	Materials product...	0.06000	m ³ kg			none			
↳ polyethylene high density gran...	Materials product...	0.00400	m ³ kg			none			
↳ polypropylene granulate (PP)	Materials product...	0.00100	m ³ kg			none			

Outputs		Amount	Unit	Costs/R...	Uncertai...	Avoide...	Provider	Data qu...	Desc
Flow	Category								
↳ PET Granulates	Water Bottle	0.06500	m ³ kg			none			

14. Issue: When updating the name of a Flow instance, the change is not reflected in the process input/output table, where that instance of flow is being used. Subject deletes the entire instance and creates and imports a new renamed one.

Solution: When renaming a flow, make sure the dependencies of that instance are also updated throughout the entire project.

Flow	Category	Amount	Unit	Costs/Re...	Uncertainty	Avoided ...	Provider	Data qual.
polyethylene terephthalate...	Materials productio...	0.06008	kg		none			
polyethylene high density ...	Materials productio...	0.06408	kg		none			
Polypropylene granulate (P...	Materials productio...	0.06108	kg		none			

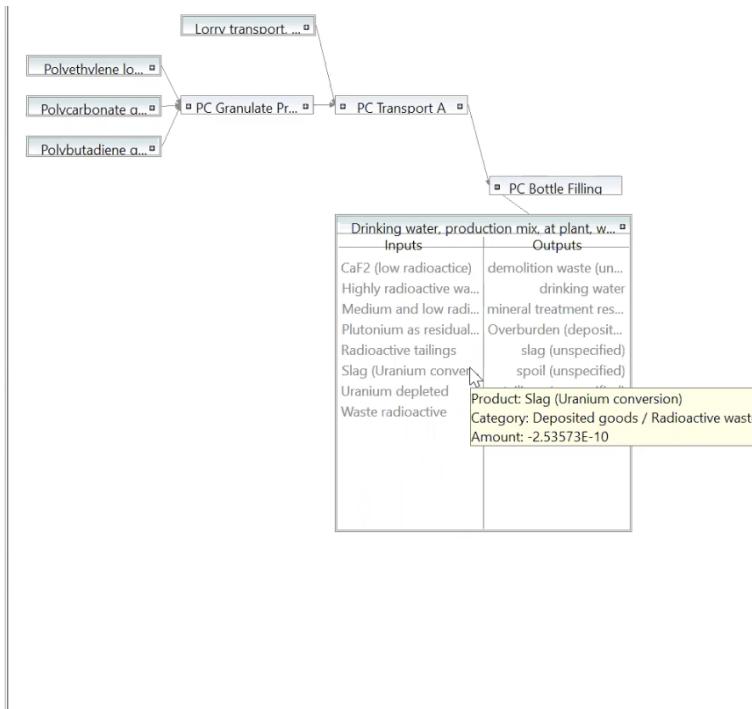
Flow	Category	Amount	Unit	Costs/Re...	Uncertainty	Avoided ...	Provider	Data qual.
PET Granulates	Water Bottle	0.06508	kg		none			

15. Issue: When interacting with the database, in the navigation bar, there are some very long string names that appear to be the same at the start, but hold vital information near the end of the string that differentiates them (for example location). However, the way that they are displayed makes it seem like it's the exact same string until you hover over it, which is when it will display the full string

Solution: Change the way the text appears on hover, or simply add some other info tab that lets the user see the full-length name. Additional signifier to show name missing. Or multiline display. Or a scrolling moving text thing.

16. Issue: Manual linking is tedious and error-prone

Solution: Only Automatic linking, scrap Manual linking



17. Issue: New Process screen has a confusing checkbox design to create a new Flow from the process

Solution: Change the design to have a more intuitive plus '+' on it

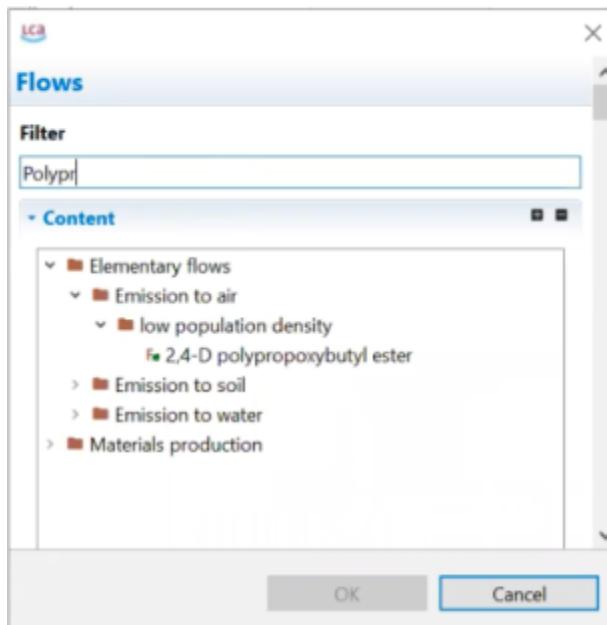
The dialog box has the following fields:

- Name:** PET Bottle Cap
- Create a waste treatment process:**
- Create a new flow for the process [in quantitative reference]:**
- Quantitative reference:** A dropdown menu with categories like "Deposited goods", "End-of-life treatment", etc.
- Finish** and **Cancel** buttons

In the second screenshot, the "Create a new flow for the process [in quantitative reference]" checkbox is checked, and the "Name of the new flow" input field is selected.

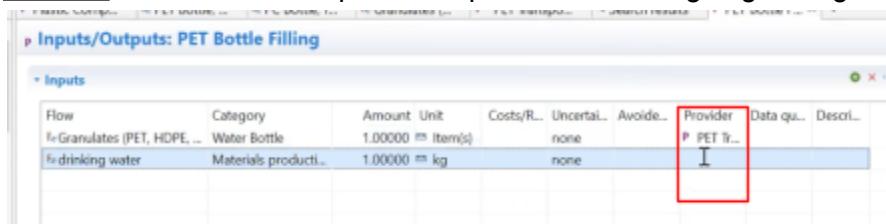
18. Issue: Explorer directories need to be opened, just filtering doesn't open them when adding a Flow in a Process

Goal: Edit the design of the explorer and improve filter functionality

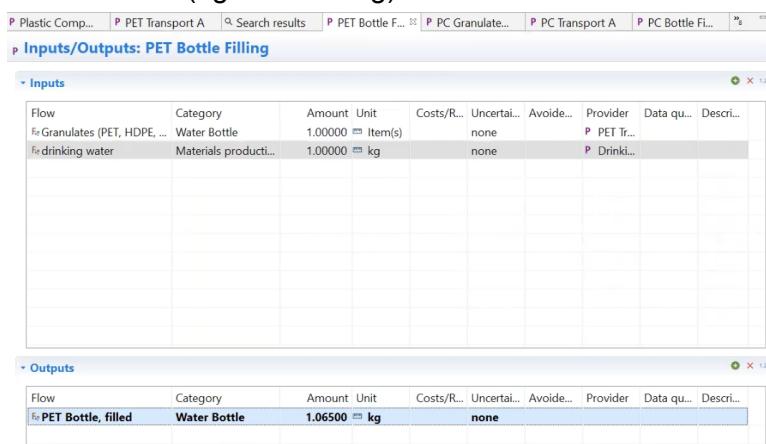


19. Issue: When editing the input/output flows in Process, we need to manually add the Providers

Solution: Add multi select provider option, instead of going through one by one



20. Issue: Must manually and from memory balance process output when input are in different units (eg. items to kg)



21. Issue: Cannot change a reference flow for a process (need to add a placeholder, then change)

Flow	Category	Amount	Unit	Costs/R...	Uncertai...	Avoide...	Provider	Data qu...	Description
polyethylene terephthalate (PET)	Materials product...	0.06000	kg	none					
polyethylene high density gran...	Materials product...	0.00400	kg	none					
polypropylene granulate (PP)	Materials product...	0.00100	kg	none					

Flow	Category	Amount	Unit	Costs/R...	Uncertai...	Avoide...	Provider	Data qu...	Description
PET Granulates	Water Bottle	0.06500	kg	none					

21. Issue: Multiple ways to create product system, can be created from a button on each of the different processes, by right clicking on product systems and then specify reference process. Why variety of choices?

General information: PET Bottle Filling

Name: PET Bottle Filling

Description:

Category: Water Bottle

Version: 0.00.003

UUID: 56363012-69c2-4af1-becf-4d5c42913b46

Last change: 2022-09-29T14:20:02-0400

Infrastructure process:

Create product system | Direct calculation | Export to Excel

Time

Start date: 2022-09-29

End date: 2022-09-29

Description:

Geography

Location:

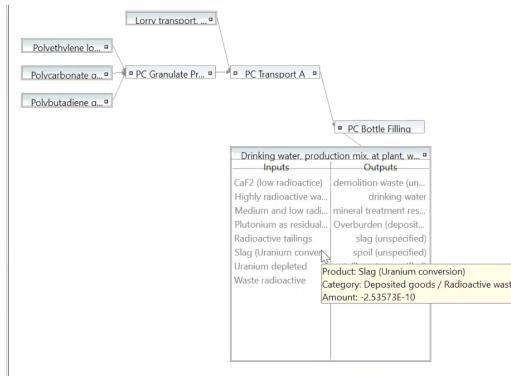
KML: none

Description:

Technology

Description: General information | Inputs/Outputs | Administrative information | Modeling and validation | Parameters | Allocation | Social aspects | Impact analysis

23. Issue: Doesn't know at what depth to stop with model manual linking, seems overly tedious, considering alternative



24. Issue: Project Wizard is overly detailed

Solution: Reduce empty or similar columns, reorganize display

P PET Bottle F... P PC Granulat... P PC Transport A P PC Bottle Fi... PET Bottle P... *PC Bottle P... *Water Bottl... 21

Project setup: Water Bottle PET vs PC production

General information

Name	Water Bottle PET vs PC production
Description	(empty)
Version	00.00.000
UUID	d81956af-1eff-488a-a2cf-1b5b90249ae6
Last change	2022-09-29T14:32:49-0400

[Report](#)

LCIA Method

LCIA Method	CML-IA baseline
Normalization and weighting set	(empty)

Impact category	Display	Label in report	Description
Abiotic depletion	<input checked="" type="checkbox"/>	Abiotic depletion	
Abiotic depletion (fossil fuels)	<input checked="" type="checkbox"/>	Abiotic depletion (fossil ...	
Acidification	<input checked="" type="checkbox"/>	Acidification	
Eutrophication	<input checked="" type="checkbox"/>	Eutrophication	

Compared product systems

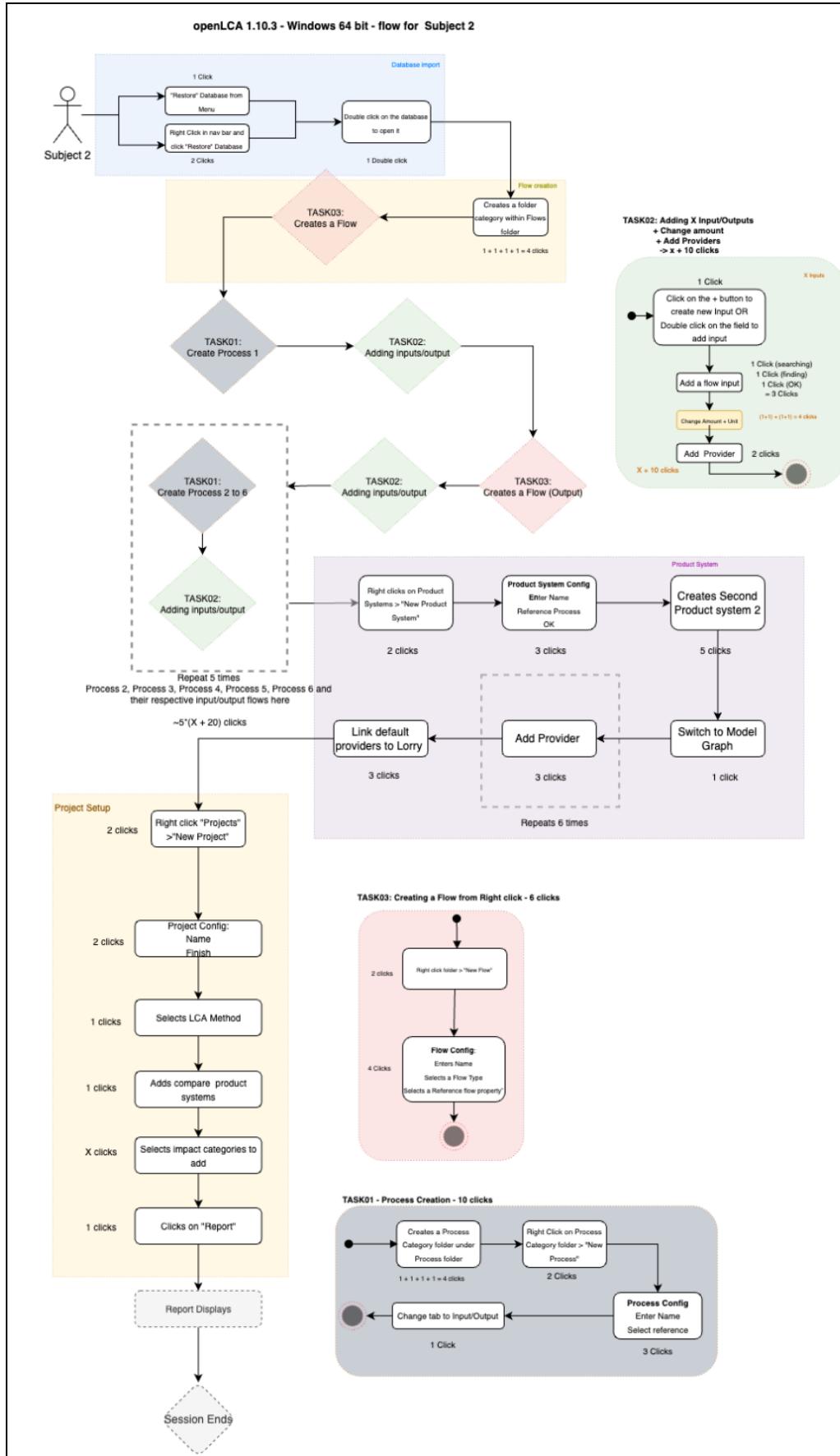
Name	Product system	Display	Allocation me...	Flow	Amount	Unit	Description
PC	PET Bottle P...	<input checked="" type="checkbox"/>	None	F _e PC Bottle, fi...	1.065	kg	
PET	PET Bottle P...	<input checked="" type="checkbox"/>	None	F _e PET Bottle, fi...	1.065	kg	

25. Issue: LCIA impact category non-searchable, a lot of non-actionable data is displayed

Solution: Implement Search bar

26. Issue: Need to deselect all of the impact categories one by one,

Solution: 'select all, or deselect all button for impact category, search bar to find selected ones



Notes for Subject 3 user observation:

Due to technical difficulties, recording for subject 3's user observation was not stored. The important issues were documented by the notes taken, noted in italic:

1. Issue: Struggled to import database

Tried "new database" to find data before facilitator led by saying the db was already on the computer, clicked restore "would have been better if it said import database"

2. Issue: Tried to search for Reference Flow Property

Tried to type when entering "ref flow property"

3. Issue: Didn't have a clear overview of created flows:

Missed a flow to create

4. Issue: Associated wrong flow for the process

Selected the wrong flow to associate when searching

5. Issue: Slow to enter provider for each input, tedious

Provider: felt like it should have been automatic

6. Issue: Didn't understand input/output amounts had to be equal

Amount didn't understand that it had to equal input

7. Issue: Missed the button to create the product system, tried multiple things before right clicking and finding

Didn't know that [project system creation] could be done from the process

8. Issue: Struggled to manual link providers

In manual tried to drag out the lines, then expanding to find the provider before right clicking and auto