

# a model and method for a circular CO2 economy

*20210824WA  
regarding the CO2 chain deep learning model*

# CO2 chain deep learning model

# object detector models

# The CO2 chain deep learning model

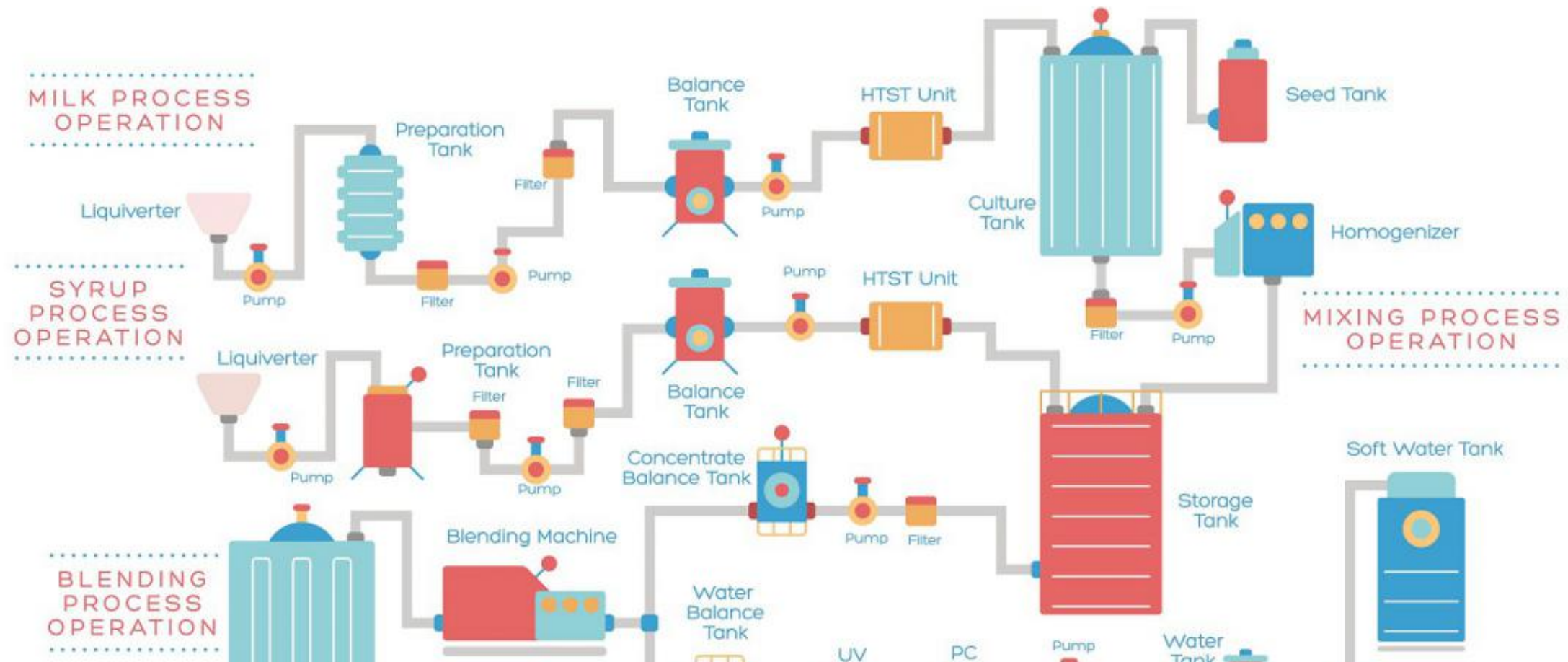
details

**requires data that  
describes the supply chain  
and the disposal chain**

how to conceptualize and encode the steps in a  
supply-destruction chain model

# how to conceptualize and encode the steps in a supply-destruction chain model

## Yakult Manufacturing Process Flow



water1 softWaterTank1 waterTank1 waterBalanceTank1 blendingMachine1 surgeTank1 filterMachine1  
cappingSealingMachine1 shrinkPackagingMachine1 reshrinkPackagingMachine1 coldStorage1  
yakult1

sugarcane1 sugar1 syrup1 liquiverter1 preparationTank1 balanceTank1 htstUnit1 storageTank1  
concentrateBalanceTank1 blendingMachine1 surgeTank1 filterMachine1 cappingSealingMachine1  
shrinkPackagingMachine1 reshrinkPackagingMachine1 coldStorage1 yakult1

lactobacillus seedTank1 cultureTank1 homogenizer1 storageTank1 concentrateBalanceTank1  
blendingMachine1 surgeTank1 filterMachine1 cappingSealingMachine1 shrinkPackagingMachine1  
reshrinkPackagingMachine1 coldStorage1 yakult1

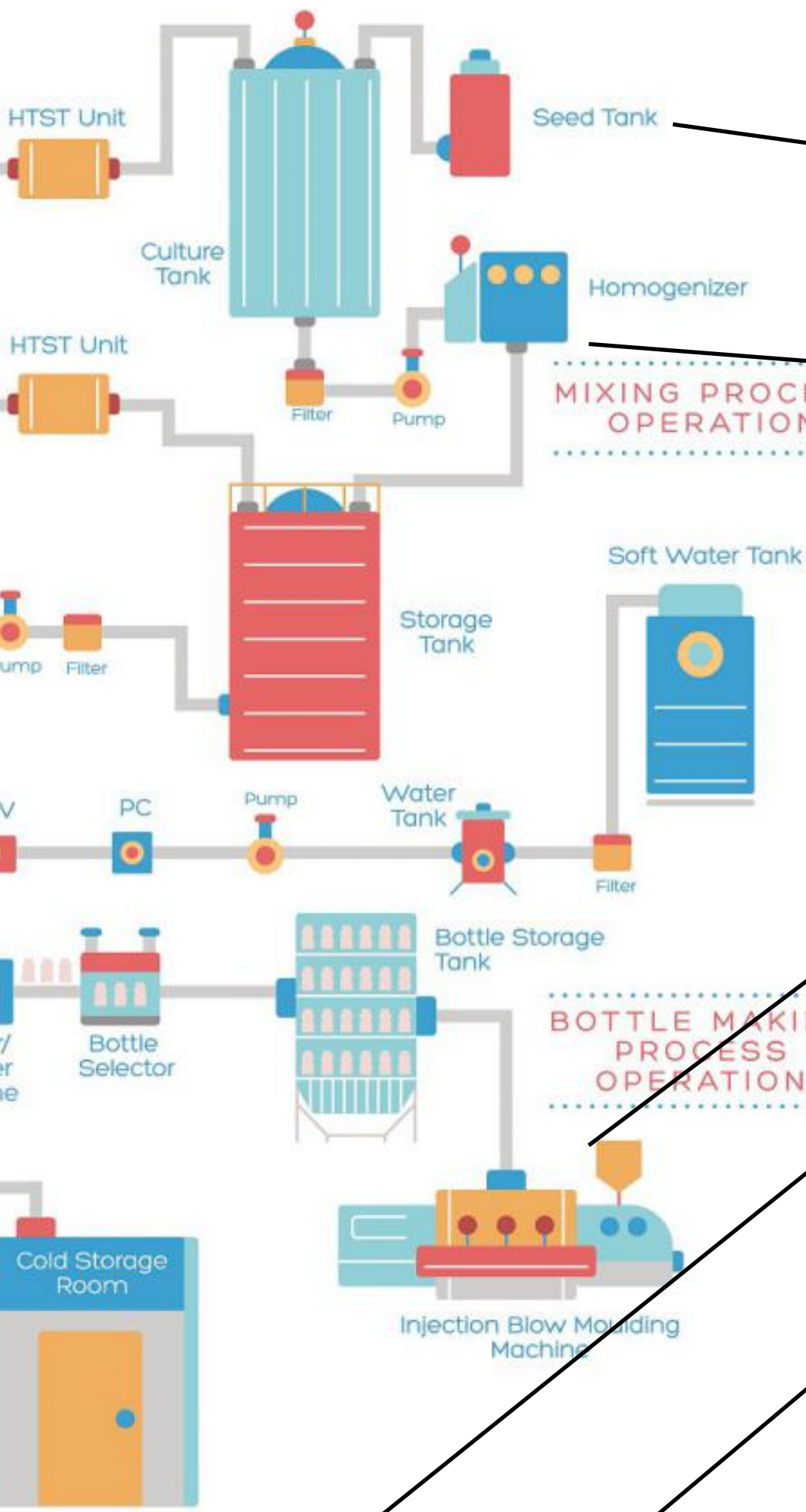
cow1 nonfatMilk1 liquiverter2 preperationTank2 balanceTank2 htstUnit2 cultureTank1 homogenizer1  
storageTank1 concentrateBalanceTank1 blendingMachine1 surgeTank1 filterMachine1  
cappingSealingMachine1 shrinkPackagingMachine1 reshrinkPackagingMachine1 coldStorage1  
yakult1

naturalflavors homogenizer1 storageTank1 concentrateBalanceTank1 blendingMachine1 surgeTank1  
filterMachine1 cappingSealingMachine1 shrinkPackagingMachine1 reshrinkPackagingMachine1  
coldStorage1 yakult1

petroleum1 polystyreneResin1 injectionBlowMouldingMachine1 bottleStorageTank1 bottleSelector1  
printerLabelerMachine1 filterMachine1 cappingSealingMachine1 shrinkPackagingMachine1  
reshrinkPackagingMachine1 coldStorage1 yakult1

soybean1 soybeanOil1 ink1 printerLabelerMachine1 filterMachine1 cappingSealingMachine1  
shrinkPackagingMachine1 reshrinkPackagingMachine1 coldStorage1 yakult1

# consumption vectors



water1 softWaterTank1 waterTank1 waterBalanceTank1 bler  
cappingSealingMachine1 shrinkPackagingMachine1 reshrin  
yakult1

sugarcane1 sugar1 syrup1 liquiverter1 preparationTank1 bal  
concentrateBalanceTank1 blendingMachine1 surgeTank1 fil  
shrinkPackagingMachine1 reshrinkPackagingMachine1 colo

lactobacillus seedTank1 cultureTank1 homogenizer1 storage  
blendingMachine1 surgeTank1 filterMachine1 cappingSealin  
reshrinkPackagingMachine1 coldStorage1 yakult1

cow1 nonfatMilk1 liquiverter2 preperationTank2 balanceTan  
storageTank1 concentrateBalanceTank1 blendingMachine1  
cappingSealingMachine1 shrinkPackagingMachine1 reshrin  
yakult1

naturalflavors homogenizer1 storageTank1 concentrateBala  
filterMachine1 cappingSealingMachine1 shrinkPackagingMa  
coldStorage1 yakult1

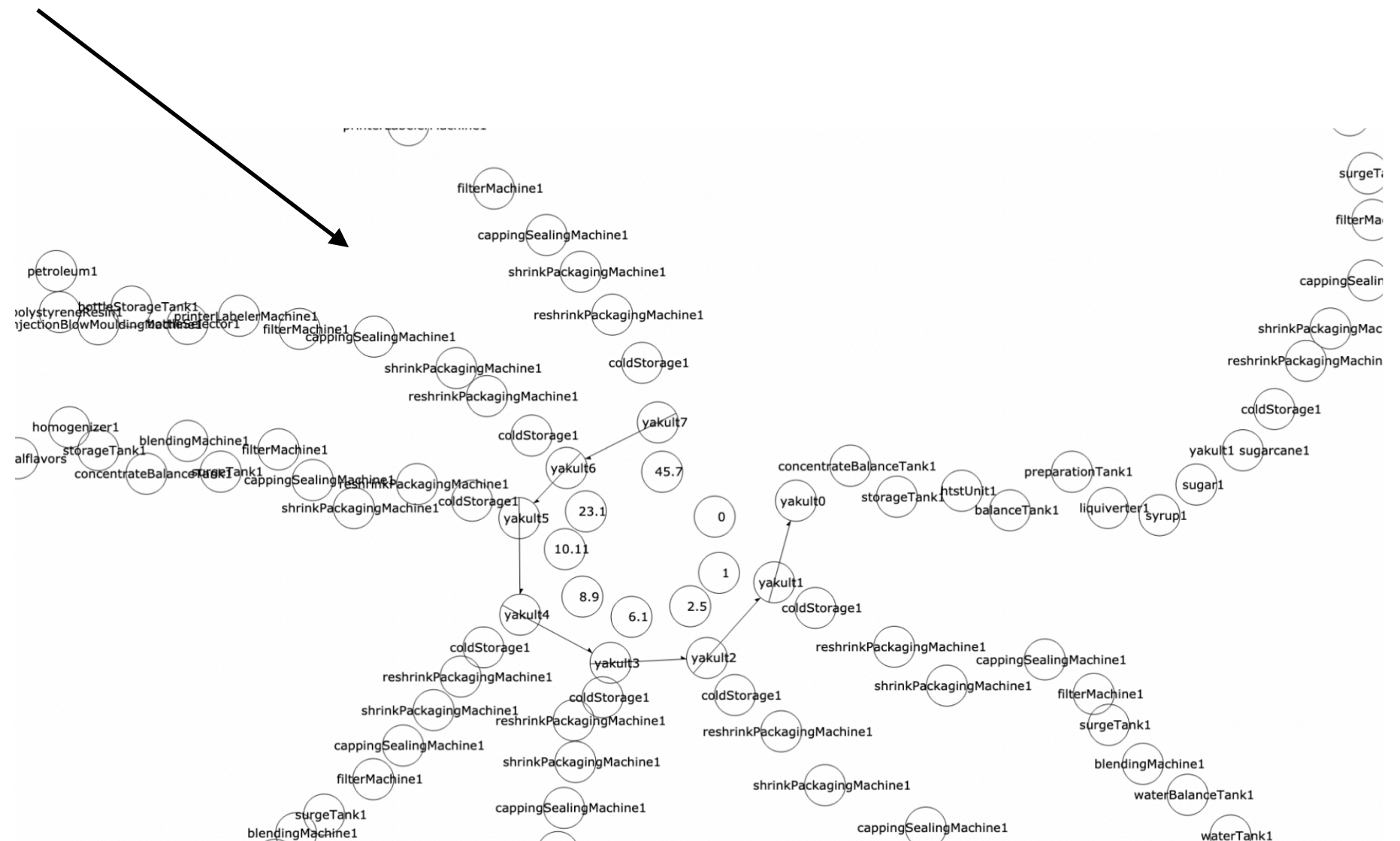
petroleum1 polystyreneResin1 injectionBlowMouldingMachi  
printerLabelerMachine1 filterMachine1 cappingSealingMach  
reshrinkPackagingMachine1 coldStorage1 yakult1

soybean1 soybeanOil1 ink1 printerLabelerMachine1 filterMa  
shrinkPackagingMachine1 reshrinkPackagingMachine1 colo

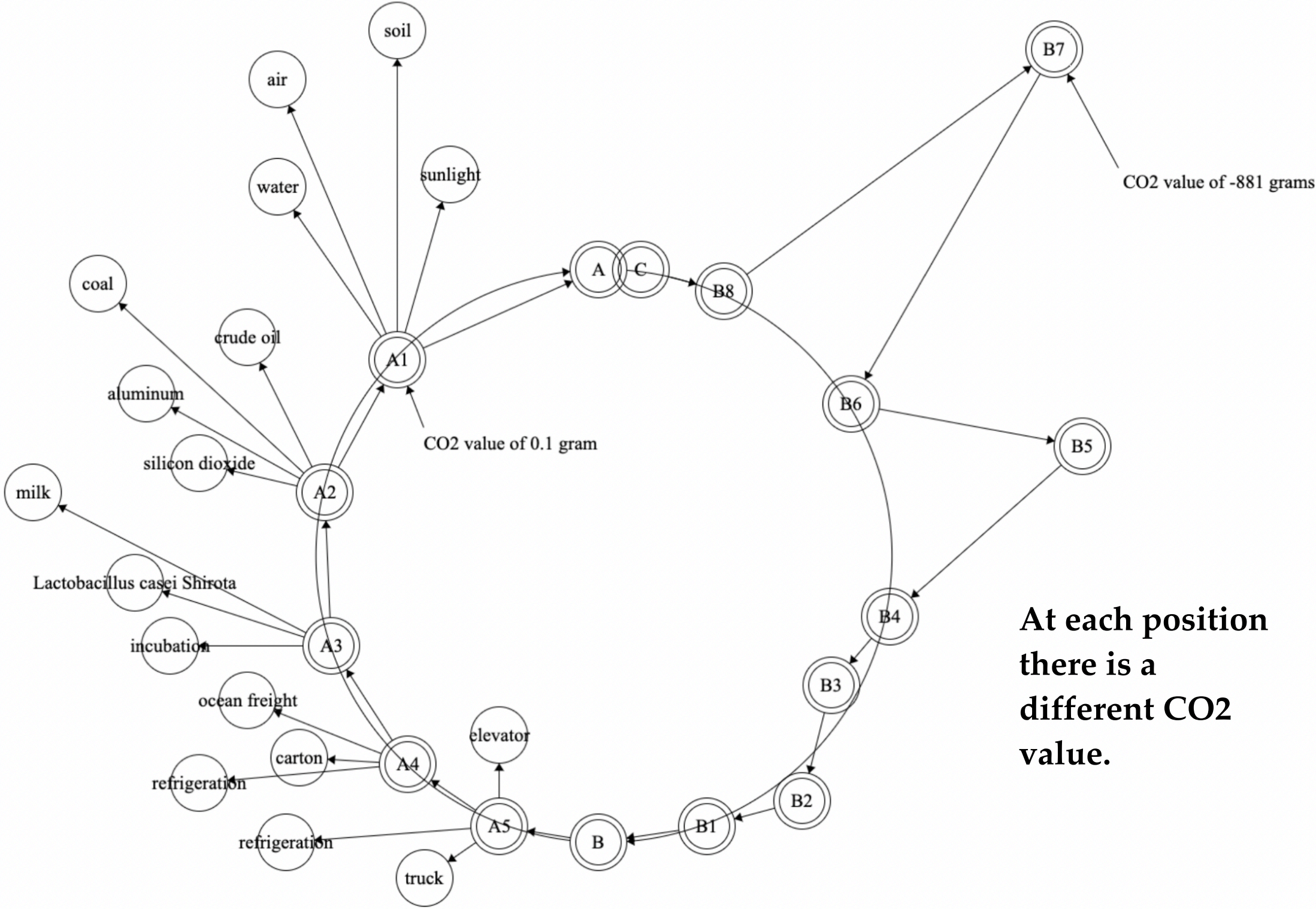


```
soybean1 soybeanOil1 ink1 printerLabelerMachine1 filterMachine1 cappingSealingMachine1
shrinkPackagingMachine1 reshrinkPackagingMachine1 coldStorage1 yakult1
```





**The circle is the the beginning to the end  
of the Yakult product.**



The simplified version of the graph is what we are using as the '*circularity economy*' diagram, which shows the carbon values as distances from a circle.













# CO2 values of printed paper

-  0 carbon printing - Google Search
-  carbonfootprint.com - Home of Carbon Footprinting
-  Custom Printed Stickers, Transfers and Die Cuts Seattle | THE FOUNDRY
-  Custom stickers | Free shipping | Sticker Mule
-  HP Commits to 100% Circular, Carbon-Neutral, Forest-Positive Printing - Sustainable Brands
-  Carbon Neutral Printing for Packaging
-  Carbon Zero | Mode Print Solutions | Mode Print Solutions
-  Carbon Labels Are Finally Coming To The Food And Beverage Industry
-  Zero Emissions Stickers | Redbubble



# CO2 values of PCB boards

- 
-  carbon cost of pcb board - Google Search
  -  Carbon Footprint Analysis of Printed Circuit Board - ScienceDirect
  -  Life cycle impact assessment of semiconductor packaging technologies with emphasis on ball grid array - ScienceDirect
  -  Carbon Footprint Analysis of Printed Circuit Board - ScienceDirect
  -  PCF\_for\_Electronic\_Products\_03.pdf
  -  Comparing Embodied Greenhouse Gas Emissions of Modern Computing and Electronics Products | Environment
  -  What's the Carbon Footprint of All Our Electronics?
  -  Advanced PCB Manufacturing Cost Calculator, Get Manufacturing Price of HDI PCBs, High-Frequency and Th
  -  Eco-Friendly Printed Circuit Boards: Present and Future Manufacturability | Advanced PCB Design Blog
  -  PCB Design and Analysis

## CO2 values of blue-jeans

• • •

*First, we have bluejeans1; bluejeans2; bluejeans3 etc. which are all positions of bluejeans on the production chain, and at each position there is a different carbon value.*



water1 softWaterTank1 waterTank1 waterBalanceTank1 blendingMachine1 surgeTank1 filterMachine1  
cappingSealingMachine1 shrinkPackagingMachine1 reshrinkPackagingMachine1 coldStorage1  
yakult1

sugarcane1 sugar1 syrup1 liquiverter1 preparationTank1 balanceTank1 htstUnit1 storageTank1  
concentrateBalanceTank1 blendingMachine1 surgeTank1 filterMachine1 cappingSealingMachine1  
shrinkPackagingMachine1 reshrinkPackagingMachine1 coldStorage1 yakult1

lactobacillus seedTank1 cultureTank1 homogenizer1 storageTank1 concentrateBalanceTank1  
blendingMachine1 surgeTank1 filterMachine1 cappingSealingMachine1 shrinkPackagingMachine1  
reshrinkPackagingMachine1 coldStorage1 yakult1

cow1 nonfatMilk1 liquiverter2 preperationTank2 balanceTank2 htstUnit2 cultureTank1 homogenizer1  
storageTank1 concentrateBalanceTank1 blendingMachine1 surgeTank1 filterMachine1  
cappingSealingMachine1 shrinkPackagingMachine1 reshrinkPackagingMachine1 coldStorage1  
yakult1

naturalflavors homogenizer1 storageTank1 concentrateBalanceTank1 blendingMachine1 surgeTank1  
filterMachine1 cappingSealingMachine1 shrinkPackagingMachine1 reshrinkPackagingMachine1  
coldStorage1 yakult1

petroleum1 polystyreneResin1 injectionBlowMouldingMachine1 bottleStorageTank1 bottleSelector1  
printerLabelerMachine1 filterMachine1 cappingSealingMachine1 shrinkPackagingMachine1  
reshrinkPackagingMachine1 coldStorage1 yakult1

soybean1 soybeanOil1 ink1 printerLabelerMachine1 filterMachine1 cappingSealingMachine1  
shrinkPackagingMachine1 reshrinkPackagingMachine1 coldStorage1 yakult1