

Redesign for  
Dero Space Heater



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## Space Heater Atom One

Dero Space Heater Atom One is a compact home heater. It features a visible display, touch buttons, automatic left-right oscillation, and a timer function. The design is simple and efficient, with an easy-to-replace filter.

## Shells



ABS



PS(sprayed)



Stainless Steel



ABS



ABS

## Accessories



User Manual



Remote

## Internal parts



PCB



Nichrome  
(Heating element)



Fan



Motor

## Packaging



PELD



CPE packaging paper



EPE Form



Corrugated packaging

Accessories



User Manual



ABS



ABS



ABS



PS(sprayed)

Internal parts



PCB



Nichrome  
(Heating element)



Fan



Motor

Shells



Stainless Steel



CPE packaging paper



Remote

Packaging



PELD



EPE Form



Corrugated packaging

# Process tree of ABS

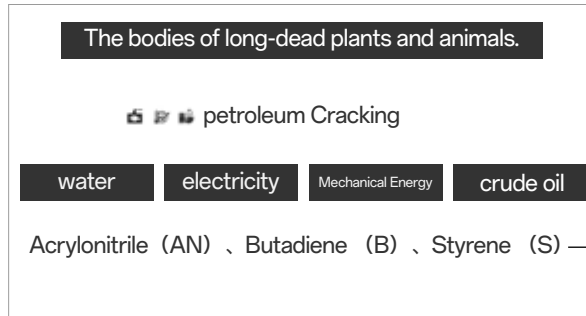
-  Water pollution
-  Global warming
-  Fire using
-  Petroleum using
-  Industrial factory

**Input**

**Output**

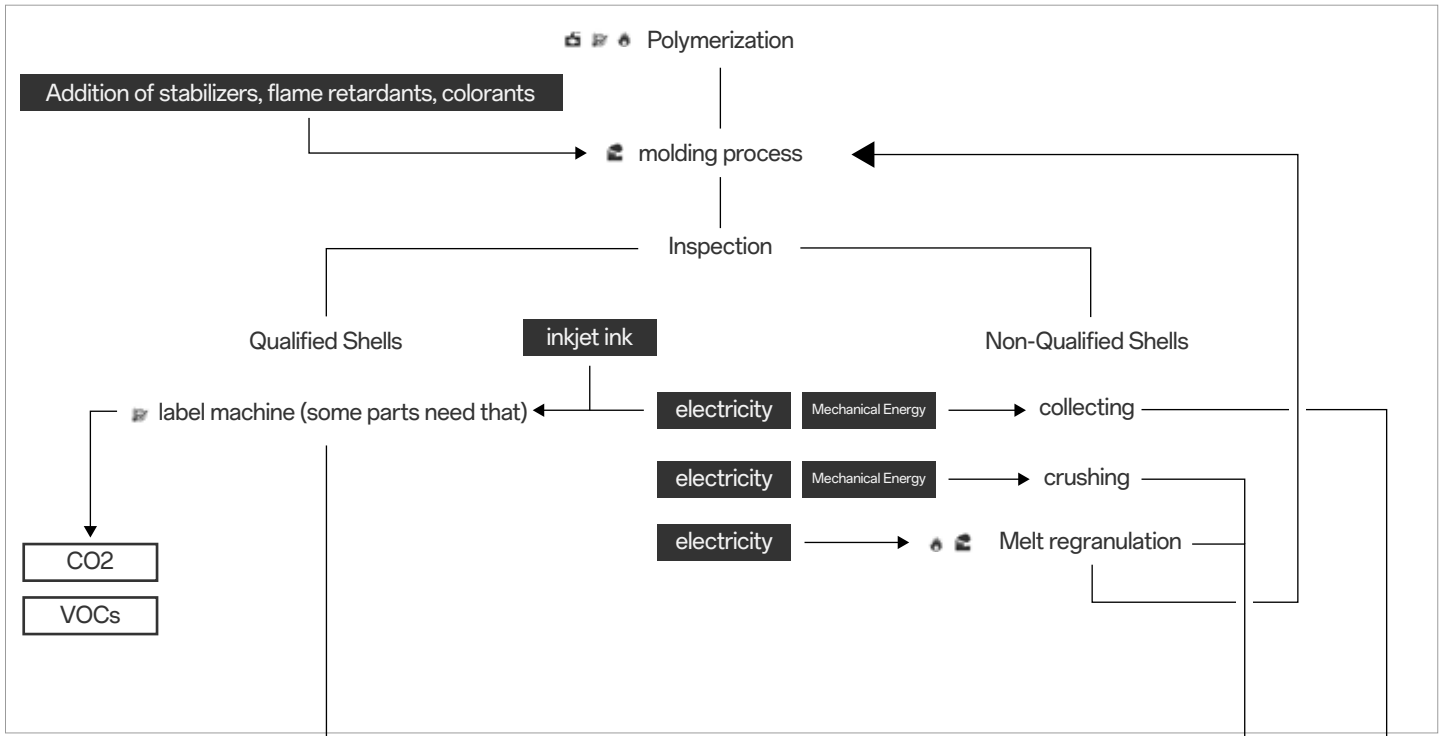
## ABS

Raw material Extraction



- CO2
- VOCs
- water pollution
- Polymer waste

Manufacturing

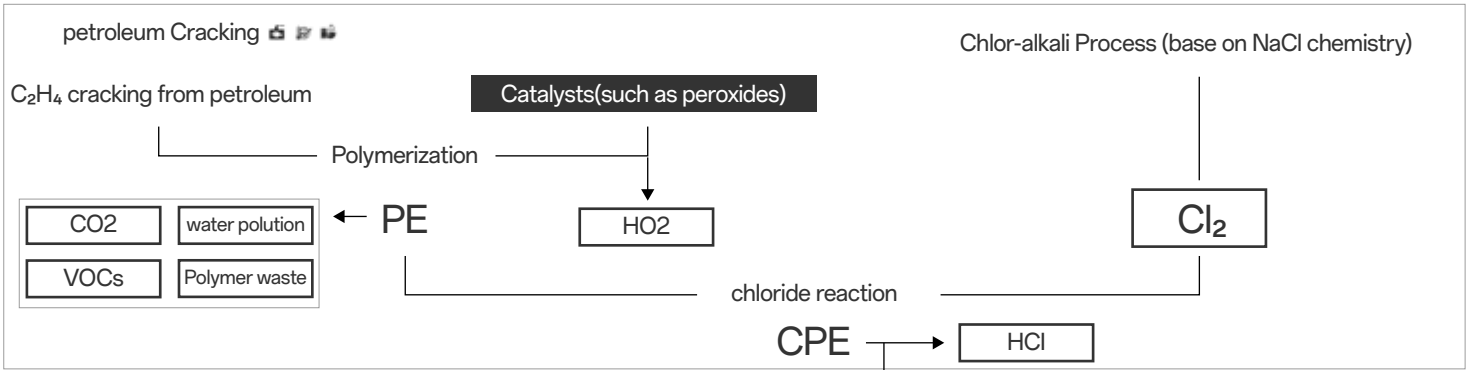


- CO2
- VOCs

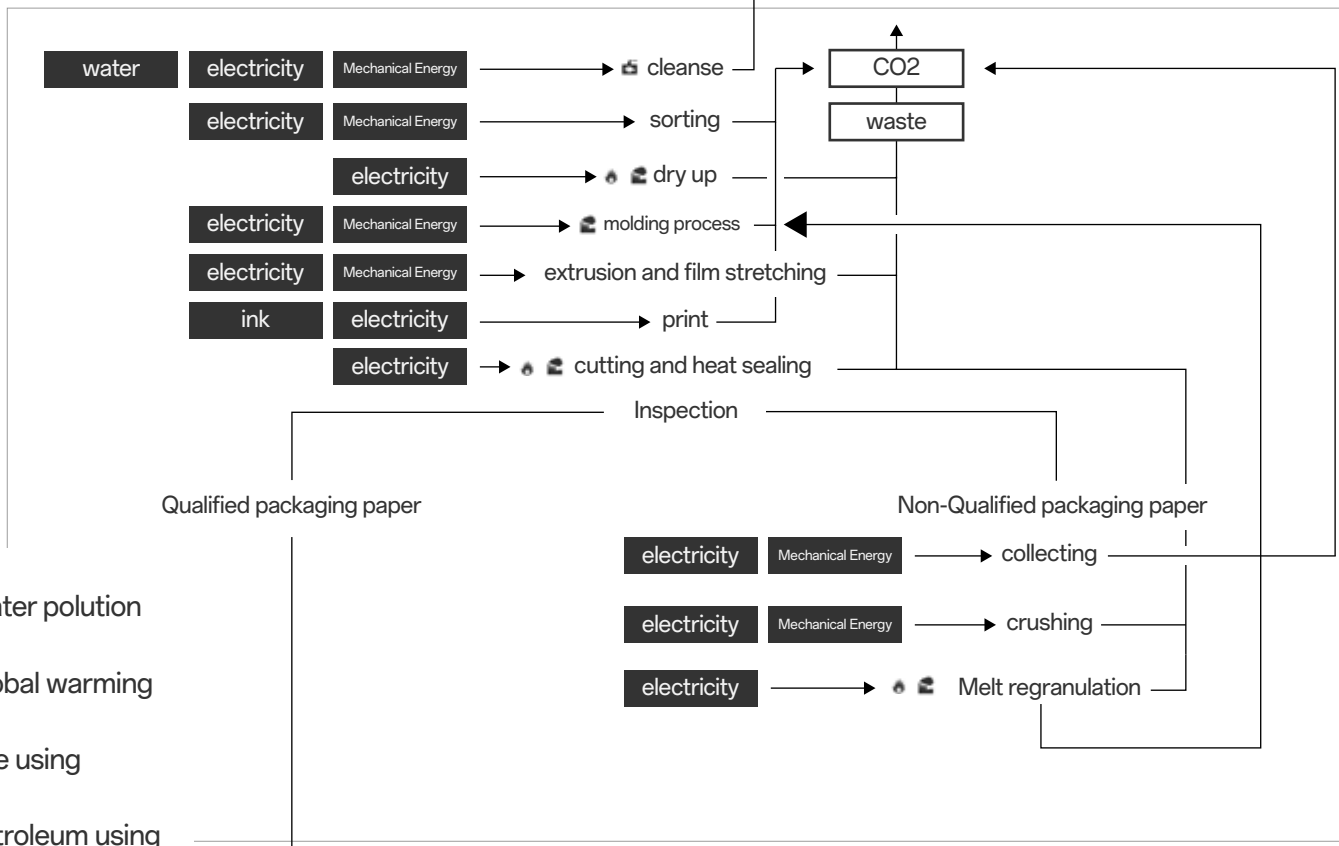
- CO2
- waste

# Process tree of CPE packaging paper

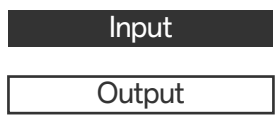
Raw material Extraction



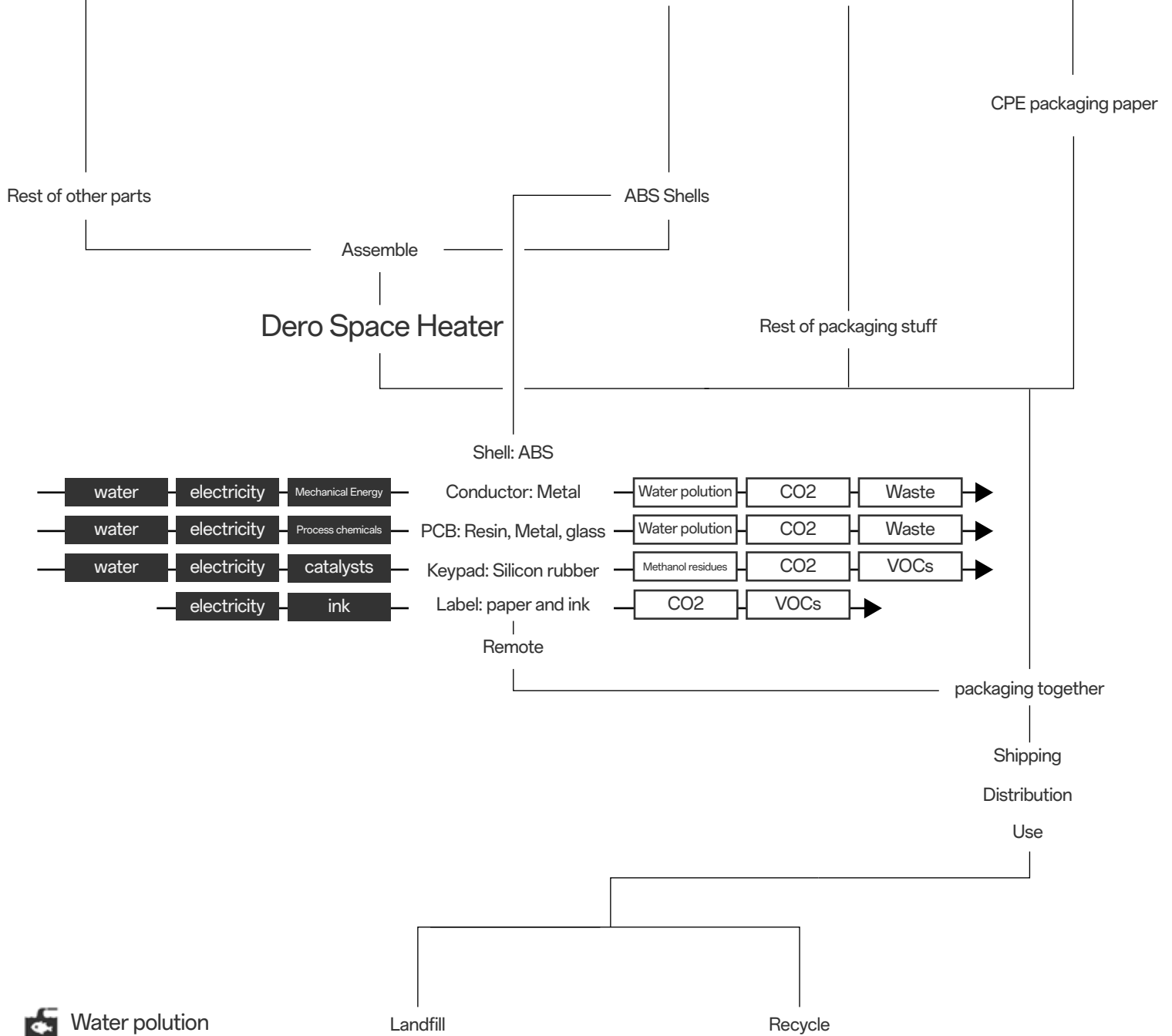
Manufacturing



- Water pollution
- Global warming
- Fire using
- Petroleum using
- Industrial factory



# Process tree of Packaging, Using and Recycling



Water pollution



Global warming



Fire using



Petroleum using




































































Industrial factory

Input

Output

# Original Inventory Matrix

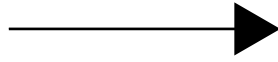
-  Large effect
-  Medium effect
-  Little effect
-  Positive effect

| resource depletion  | global warming  | ozone layer destruction   | land erosion  | water pollution   | air pollution   | solid waste   | biodiversity degradation   |                           |
|---|---|---|---|---|---|---|--|---------------------------|
|   |   |   |   |   |   |   |   | material processing       |
|  |  |  |  |  |  |  |  | molding and manufacturing |
|  |  |  |  |  |  |  |  | assemble and packaging    |
|  |  |  |  |  |  |  |  | retail and selling        |
|  |  |  |  |  |  |  |  | using products            |
|  |  |  |  |  |  |  |  | recycle: sorting          |
|  |  |  |  |  |  |  |  | recycle: cleanse          |
|  |  |  |  |  |  |  |  | recycle: remaking process |

# Strategies



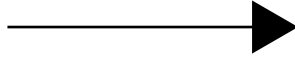
ABS



Mixing rPP



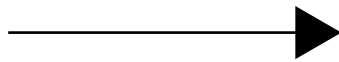
CPE packaging paper



Kraft paper

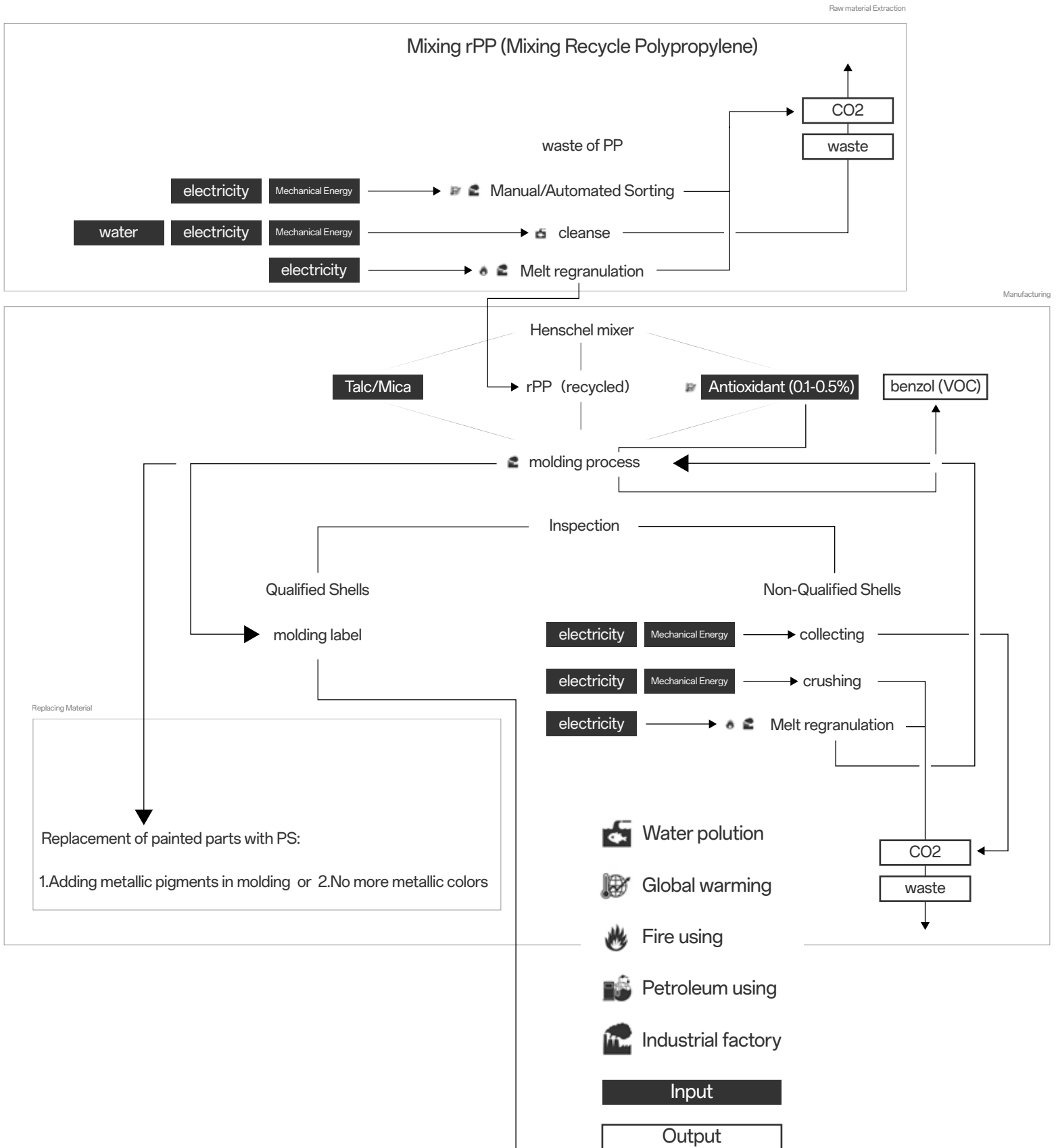


Remote

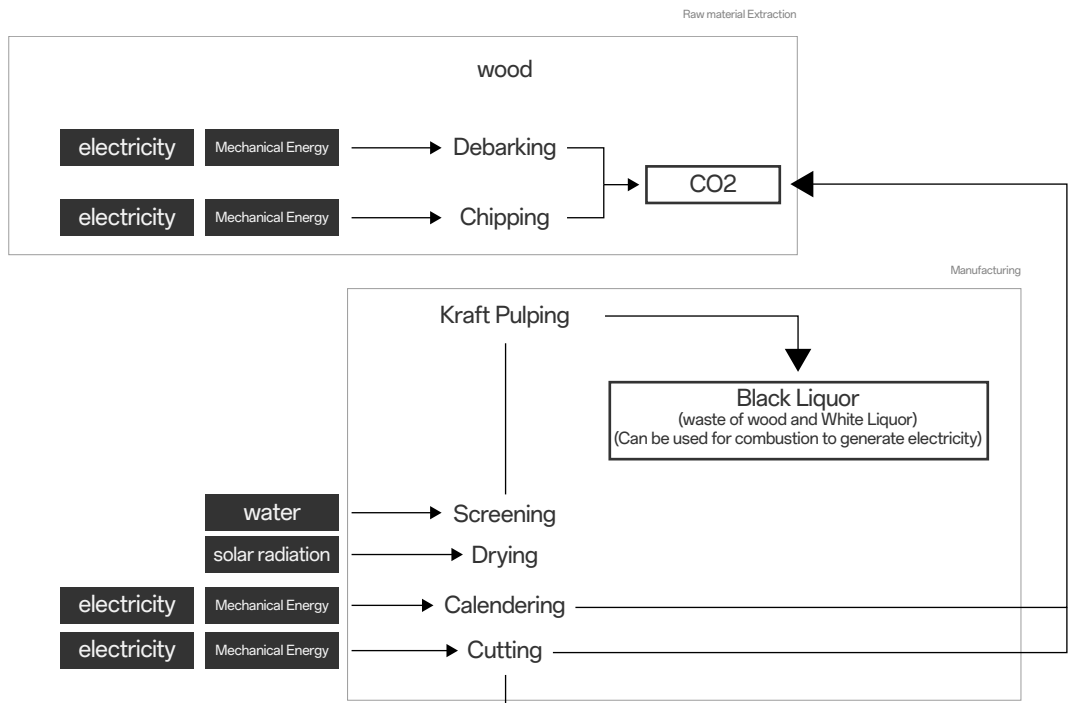


Voice control  
AI assistant

# Process tree of Mixing rPP (Mixing Recycle Polypropylene)



# Process tree of Kraft paper (Unbleach mat paper)



Water pollution



Global warming



Fire using



Petroleum using

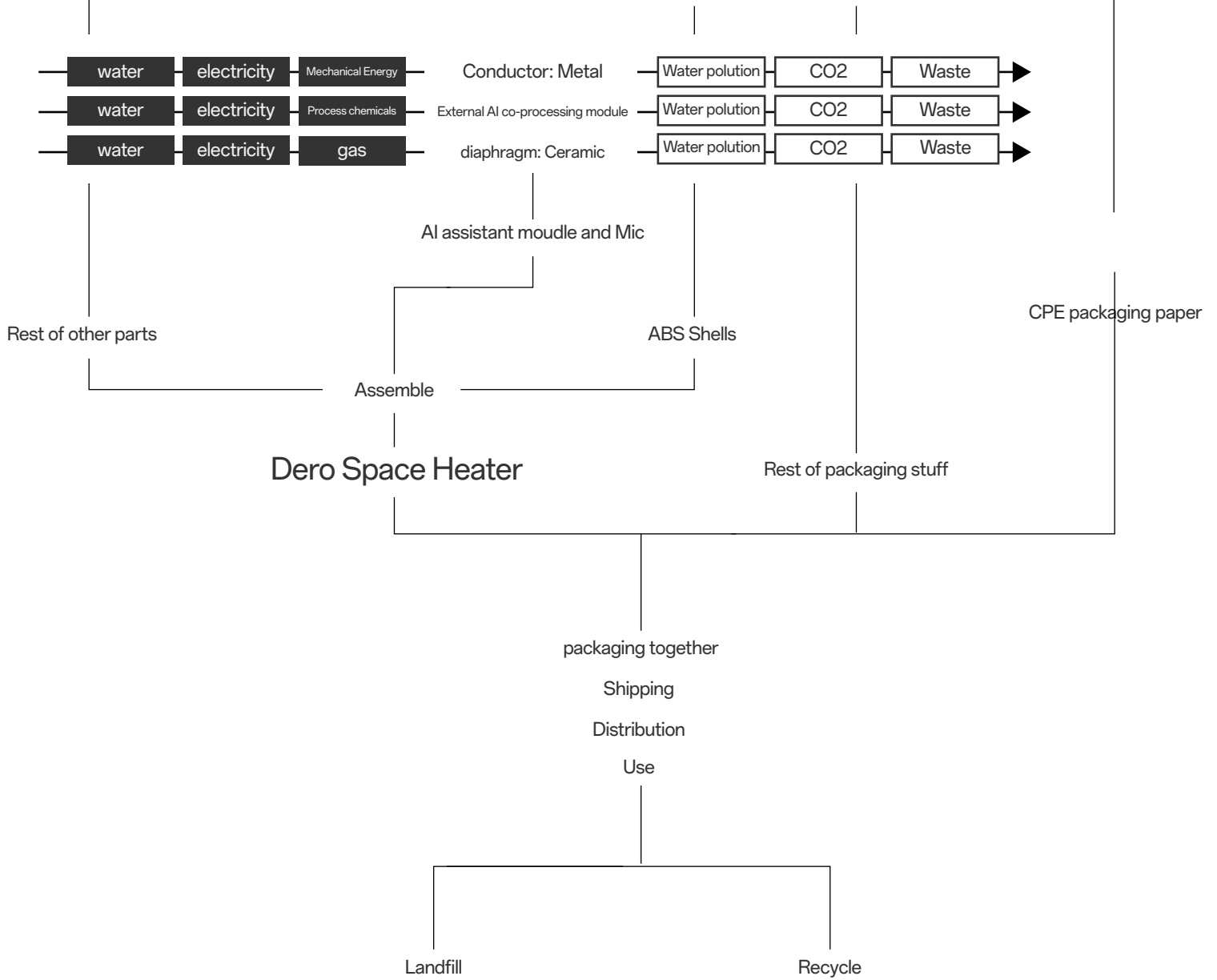


Industrial factory


Input

Output

# Process tree of Packaging, Using and Recycling



 Water pollution

 Global warming

 Fire using

 Petroleum using

 Industrial factory

**Input**

Output

# Inventory Matrix after Redesign

- Large effect
- Medium effect
- Little effect
- Positive effect

| resource depletion | global warming  | ozone layer destruction | land erosion      | water pollution | air pollution   | solid waste       | biodiversity degradation |                           |
|--------------------|-----------------|-------------------------|-------------------|-----------------|-----------------|-------------------|--------------------------|---------------------------|
| ● Little effect    | ● Medium effect | ● Little effect         | ● Large effect    | ● Little effect | ● Little effect | ● Large effect    | ● Medium effect          | material processing       |
| ● Positive effect  | ● Medium effect | ● Little effect         | ● Little effect   | ● Little effect | ● Medium effect | ● Medium effect   | ● Little effect          | molding and manufacturing |
| ● Little effect    | ● Medium effect | ● Little effect         | ● Little effect   | ● Little effect | ● Medium effect | ● Medium effect   | ● Little effect          | assemble and packaging    |
| ● Medium effect    | ● Large effect  | ● Little effect         | ● Little effect   | ● Little effect | ● Medium effect | ● Large effect    | ● Medium effect          | retail and selling        |
| ● Positive effect  | ● Large effect  | ● Little effect         | ● Positive effect | ● Little effect | ● Little effect | ● Positive effect | ● Medium effect          | using products            |
| ● Little effect    | ● Little effect | ● Little effect         | ● Little effect   | ● Little effect | ● Medium effect | ● Little effect   | ● Little effect          | recycle: sorting          |
| ● Medium effect    | ● Little effect | ● Little effect         | ● Medium effect   | ● Little effect | ● Little effect | ● Little effect   | ● Medium effect          | recycle: cleanse          |
| ● Positive effect  | ● Large effect  | ● Little effect         | ● Medium effect   | ● Little effect | ● Little effect | ● Positive effect | ● Little effect          | recycle: remaking process |



## Conclusion

In the redesign process, I focused on changing materials or reducing the use of materials. The material with the largest proportion in the original design is ABS. Although it is recyclable plastic, we can take it a step further by directly using recycled PP made from mixed bio-based materials (~15-20% lower carbon footprint, depending on recycling infrastructure). The CPE packaging material on the packaging is very difficult to recycle, so using Kraft paper directly is also a simple solution, similar applications have already appeared in many toys(60-80% reduction in packaging pollution, assuming sustainable sourcing). Finally, instead of discarding the remote control, we can add an AI voice assistant to make remote control simpler and more streamlined(~30-50% less e-waste, but depends on AI energy efficiency).

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Thank you  
for your attention

