

MUJI Screwdriver Set Investigation: Negative impacts on Environment

Brand philosophy: Muji aims to eliminate all the unnecessary functionality, excessive decoration, and packaging for their product. Muji aspires to modesty, plainness, and simplicity.

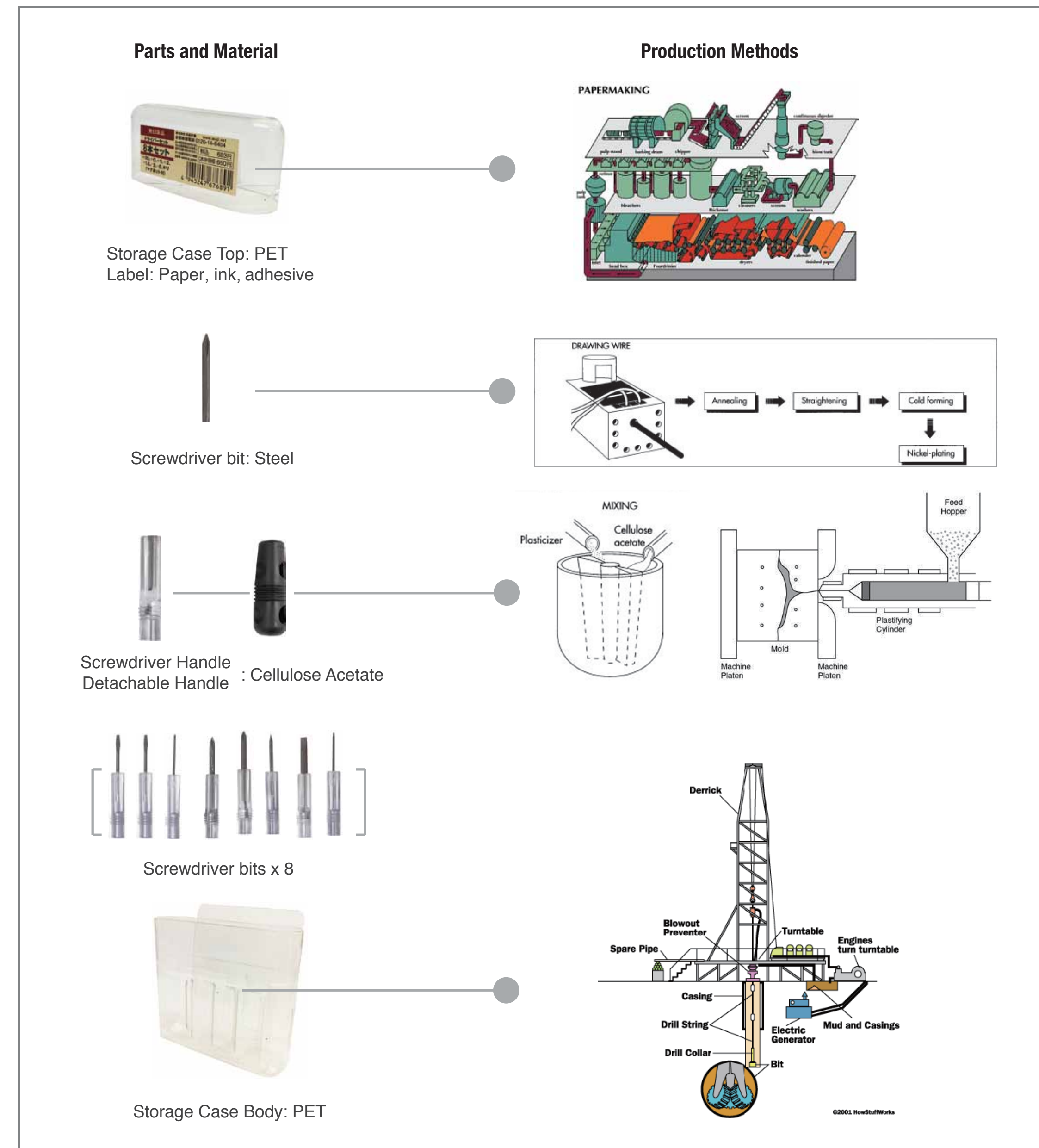


SUSPECT PROFILE

Name: Muji Screwdriver Set
 Company: Muji LTD.
 Manufacture: Muji LTD in Japan
 Suspect's plea:
 The package can be used as a storage box, and thus stays as long as screwdrivers.
 The detachable handle is helpful when extended length of handle or much force is needed.
 The bit set satisfies most of needs for screwdriving.



SUSPECT ANALYSIS



Top Suspicion 1

Screwdriver bit - steel



Observation:
 Unnecessary amount (2.75in each) of steel is used for screwdriver tips.

Production of the steel screwdriver bit may cause ecological damage, human health damage, and resource depletion.
Ecological Damage -
 During the raw material stage (iron mining), improper management of mined materials (such as tailings, waste rock, etc.) may cause acid mine drainage, which can lead to serious water contamination. Fish and other aquatic life are unlikely to survive in such condition.
Human Health Damage -
 Contaminated water, which contains acid and various chemicals, is extremely harmful to human health.
Resource Depletion -
 Iron is a non renewable resource.



Rio Tinto, Spain, Acid Mine Drainage
 The river is very acidic and the reddish hue is due to iron dissolved in water.



Fish and other aquatic life are unlikely to survive in acidic water.

Top Suspicion 2

Storage Case - PET



Observation:
 Consumers can only buy a whole set of screwdrivers. No flexibility of purchasing a specific bit or replacement. Unnecessary waste is created.

Production of PET storage case during the raw material stage (oil drilling) may cause ecological damage, human health damage, and resource depletion.
Ecological Damage -
 Just like any underground work, drilling waste need to be properly handled. Otherwise, hazardous wastes will be released to the environment, causing ecotoxicity and habitat alteration.
Human Health Damage -
 Improper management of oil drilling will ruin ground water, and release toxic chemicals, which will largely affect human health.
Resource Depletion -
 Petroleum is non renewable resource.



Gulf of Mexico, Oil Spill
 Oil spill is fatal to many wildlife. For example, oil destroys insulating quality of birds, which may die from hypothermia.



Niger Delta, Shell Company, Oil Spill
 Oil spill also affects human health, especially health of people within the area of oil spill.

Top Suspicion 3

Screwdriver - Steel and Cellulose Acetate



Observation:
 Screwdriver bit and handle can not be separate, creating issue of recyclability.

The steel bit and the plastic handle is hard to separate, which causes difficulties in recycling. They are likely to be landfilled, especially in NY. Chemical of the plasticizer added in the CA during the production stage may be released.
Human Health Damage -
 Long term effect of plasticizer (phthalates) on human health is uncertain yet. However, research shows that "higher fetal exposure to phthalates through the mother's blood with increased risk of developmental abnormalities in male infants.



Muji, Screwdriver bit and handle, Undetachable



Landfill site



Plasticizer (phthalates) in plastic-making process may affect health of fetus.

Advanced Suspect Analysis - MUJI Screwdriver Set Process Tree

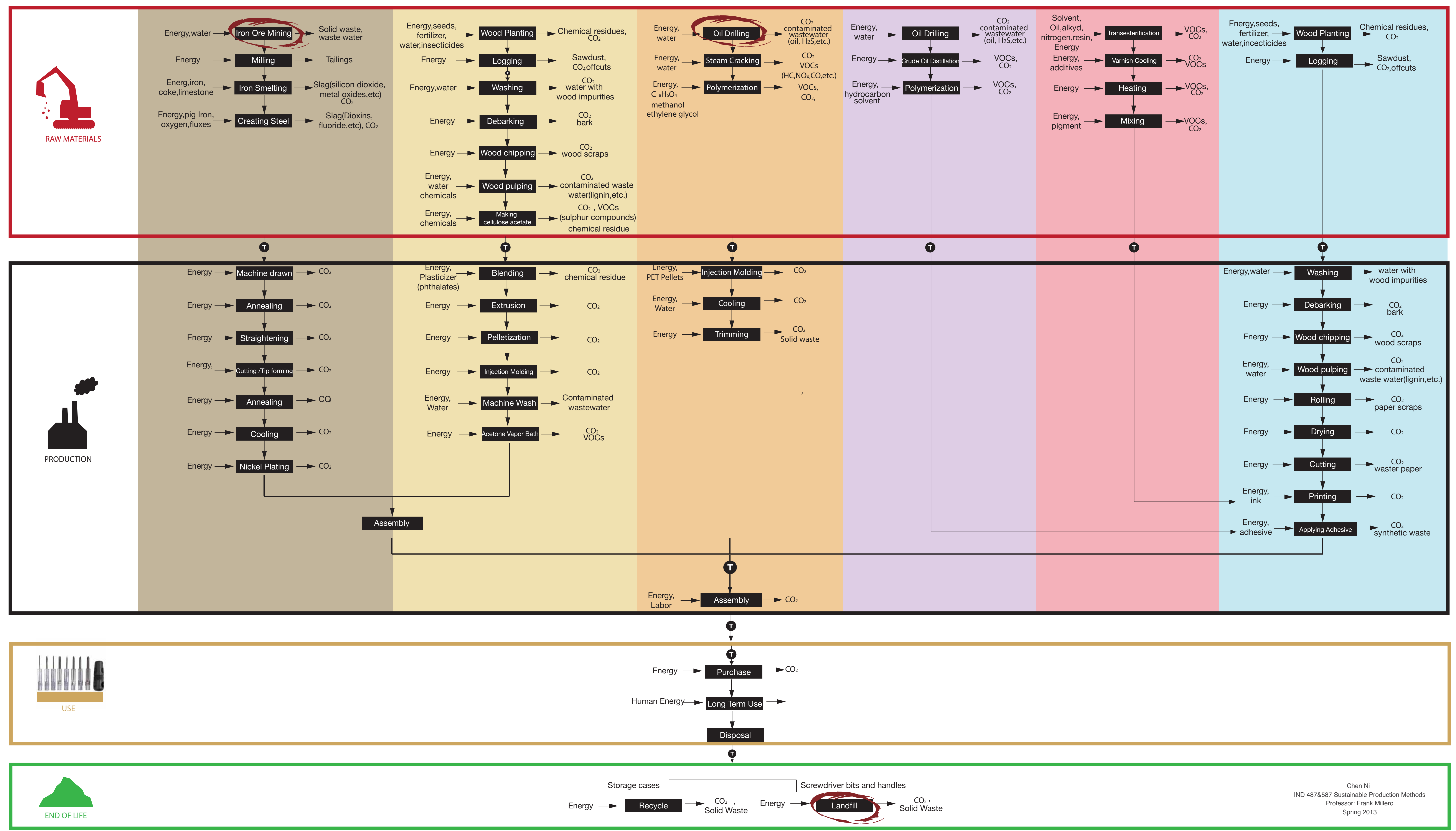
Steel/Screwdriver bits

Plastic

Adhesive

Ink

Paper/Sticker



Case Study # 1 - Mini Muji Screwdriver Set

Keyword: Reduce

Muji Mini Screwdriver Set has already integrated the idea of reducing material use by limiting the number of bits available, and by using one universal handle for all the bits.

Application in proposed screwdriver

Instead of buying eight bits and nine handles in one set, consumers can now buy the combination of bits that they really need with one universal handle.

Impacts on environment

By reducing the amount and length of screwdriver bits, less iron is needed. Therefore, impacts brought by iron mining, such as water contamination, can be efficiently reduced. Amount of Plastic needed is also decreased by using one universal handle.



Before

- No flexibility of choosing screwdriver bits
- Bit and handle cannot be disassembled
- Each bit has its own handle

Case Study # 2 - Home Depot 6-N-1 Screwdriver

Keyword: Reduce, Recycle

Home depot's screwdriver houses four different bits, which share the same handle and metal bar. Mechanism of connection also enables different parts of screwdriver to be easily disassembled and recycled.

Application in proposed screwdriver

All the different parts of screwdriver in the new Muji set can be separated, enhancing opportunities to be recycled.

Impacts on environment

More material in the new Muji set can be used as technical nutrients. Reducing the consumption of virgin material and corresponding impacts on environment.



Case Study # 3 - Envases Emium

Keyword: Reuse

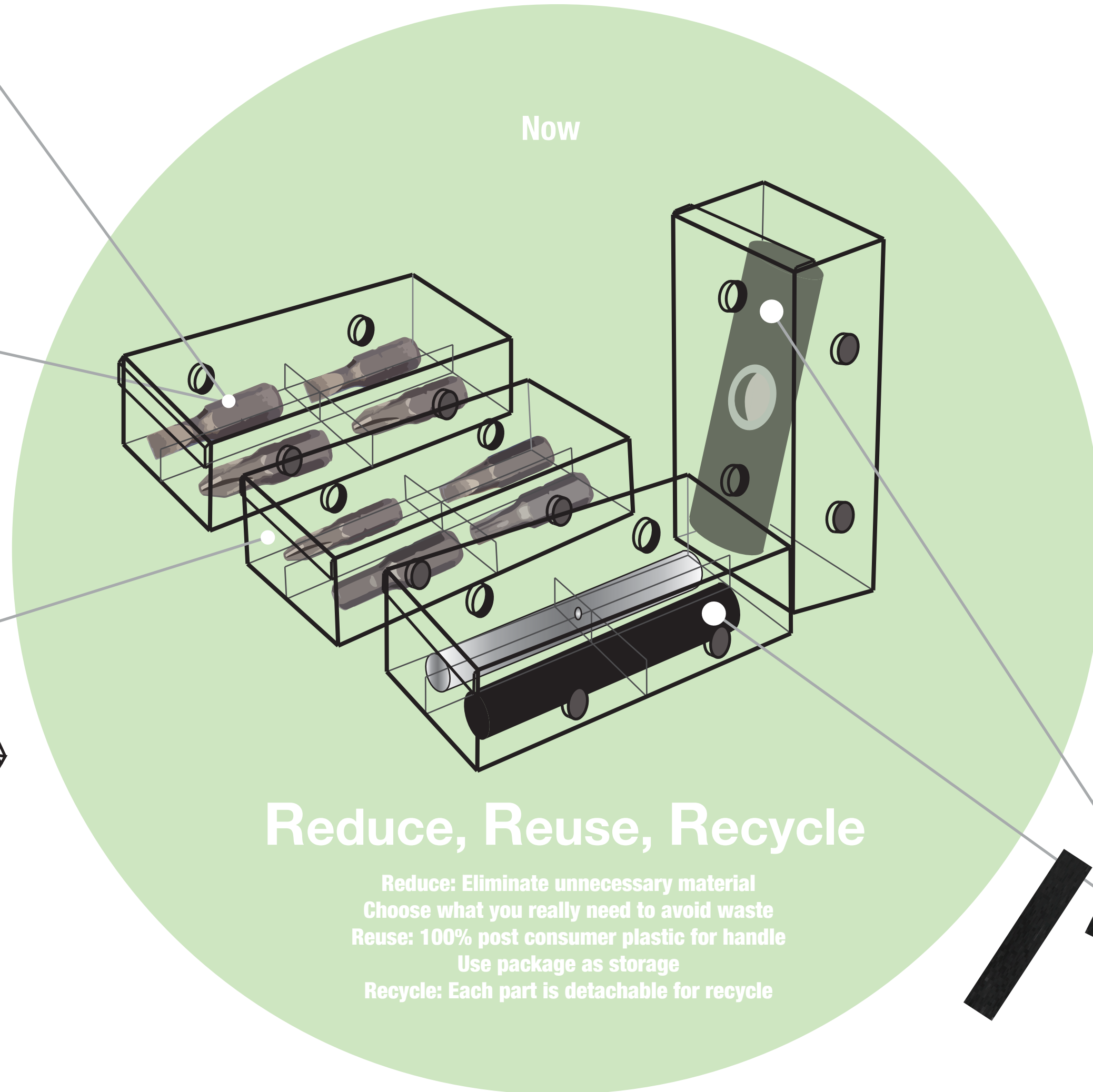
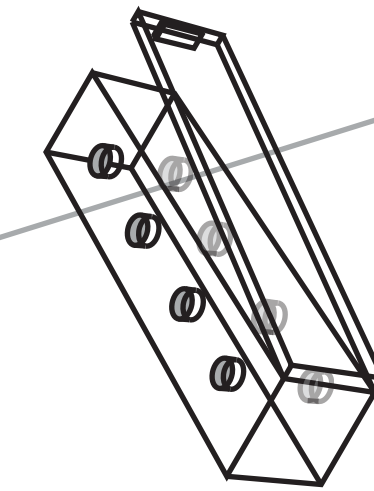
Emium's water bottle can be used both as container and building blocks thanks to its smart modular structure. The bottle isn't merely one-time-use plastic container because of the structure.

Application in proposed screwdriver

Modular system is applied in the package of the new screwdriver set. Consumers can pick the sets they want and snap them into a bigger set.

Impacts on environment

Amount of plastic is reduced by breaking down the sizes of packages. Less petroleum is needed; thus, the corresponding impacts of oil drilling is alleviated.



Suspect Investigation Report

Appearance of Muji's screwdriver set is coherent to its brand philosophy. However, material of the screwdriver set is not as friendly and modest as the brand has suggested. Fortunately, Muji starts to move towards more sustainable designs by reducing more unnecessary materials. One example will be Muji's Mini Screwdriver Set. As a big fan of Muji, I hope to see more thoughtful and sustainable designs from Muji, because I believe Muji is not only a commercial brand, it is also advocating a modest lifestyle and a respectful mind to nature.

Case Study # 4 - Fiskars Eco Works Scissors

Fiskars Scissors's handle uses 100% post-consumer plastic.

Application in proposed screwdriver

Color of post-consumer plastic is mostly dark and black, which may limit its use. However, color black and the eco-friendly material fits well with Muji's brand philosophy.

Impacts on environment

Use of post-consumer plastic instead of virgin material, such as oil and wood, enormously reduces the impacts on environment. These impacts include ecological damage, human health damage, and resource depletion.



Key Words: wood pulp, cellulose acetate, plasticizer, acetone vapor bath, iron ore mining, slag, limestone, pig iron, flux, arsenic, nickel plate, oil drilling, polymerization, VOCs, PET, PET pellets, polyethylene, ballings, drilling waste, environment, impact, damages, human health, ecological, resource depletion, injection molding, steel, landfill, acid mine drainage, post-consumer, packaging
Source: American Chemistry Council. "Plastic Packaging Resins." n.d. PDF file. 12 Feb. 2013. [Borealis.Laurens.com](#).
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