The journey of developing sustainable materials for LEGO bricks

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The LEGO Group’s mission is to inspire and develop the builders of tomorrow.
We want to make a positive impact on the world our children will inherit.
Commitment to use renewable energy
Commitment to use sustainable materials in all core products and packaging
The LEGO Group Guiding Principles for life cycle assessment

Provides guidance on

- Standards and requirements
- LCA method (attributional)
- Impact assessment method
- Recycled materials
- Bio-based materials
**Products**

**RENEWABLE**
Made of recycled and/or sustainably sourced renewable materials

Sustainable materials cannot compromise
- Safety
- Consumer-perceived quality
- Durability of elements

**Packaging**

**RENEWABLE**
Made of recycled and/or sustainably sourced renewable materials

**EFFICIENT**
Eliminate excessive packaging with no consumer experience value-add

**RECYCLABLE**
Recyclable by consumers
Made of paper based materials whenever possible

Sustainable materials cannot compromise
- Safety
Organizational capabilities for sustainable materials

1. Material R&D: Chemists, physicists, Mechanical engineers, Colour experts, test engineers, colour experts.

2. Environmental & Safety: Environmental experts and product safety chemists, test engineers. Supported by external advisory board.

3. Product and production: Mechanical engineers, Process engineers, Moulding experts, Test and lab staff, Designers, Quality Engineers, EHS.

Creating circuity for plastic

1. Create an effective after-use plastics economy

- Recycling: Radically improved economics and quality

- Other material streams

- Ad and/or composting

- Energy recovery

- Leakage

2. Decouple plastics from fossil feedstocks

- Renewable sourced virgin feedstock

- Design and production

- Use

- Drastically reduce the leakage of plastics into natural systems and other negative externals

This model from the Ellen MacArthur Foundation, which illustrates our thinking about a circular plastic economy
Carbon sources
Carbon Capture

- CO₂
- H₂
- Green Energy

Base chemicals

Monomers

Polymerization Compounding

Chemical Recycling
- Chemical/thermal decomposition
- Base chemicals
- Monomers
- Depolymerization
- Polymerization Compounding

Mechanical Recycling
- Sorting and cleaning
- Use phase
- Waste

Product manufacturing

Use phase

Waste
Learnings in general

• The preparation process for sustainable materials has created a deeper understanding of present products and production processes.

• The organization is both learning the hard way and the smart way. New competences are created all across many departments.

• Industry and academia goes well together towards sustainable solutions.

• In order to develop sustainable materials for toys, you must know what a good play is for children.

• In order to produce really sustainable materials, you must know how the planet works.
Thanks for your attention..

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