Permanent Materials

A new material category

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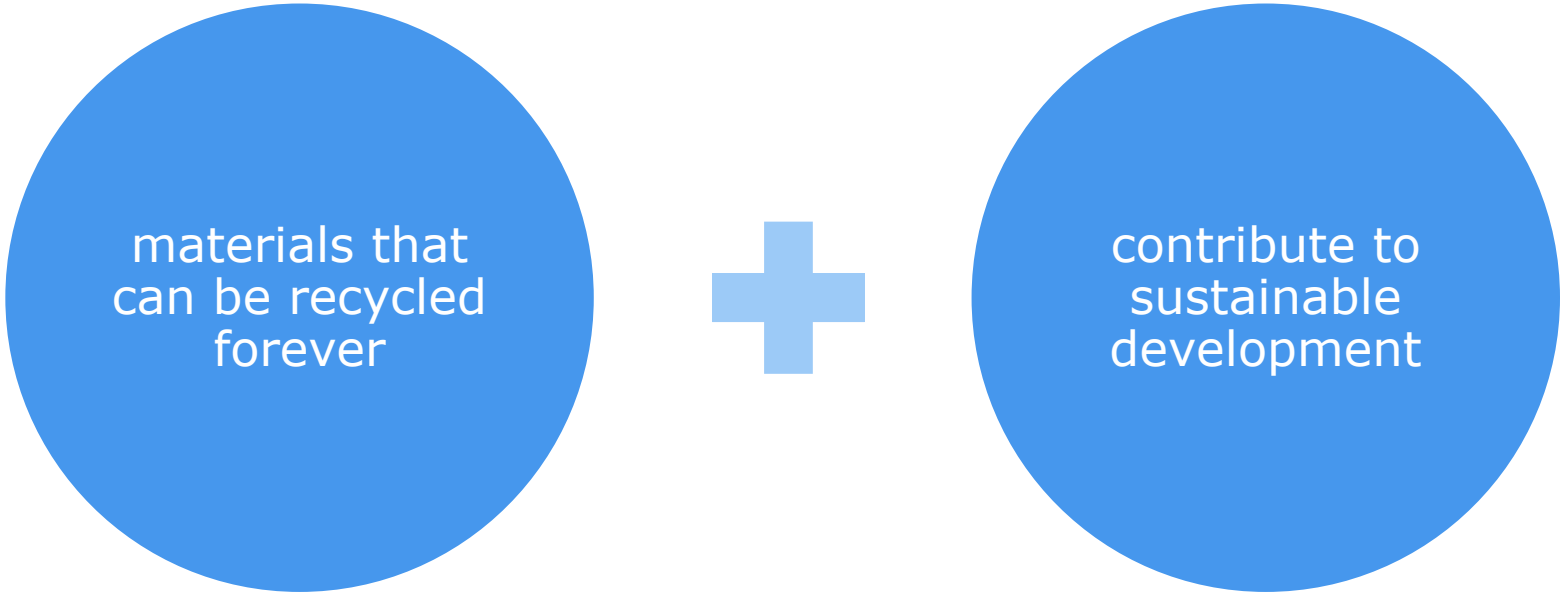
Imagine



The perfect example of a circular economy

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Sustainable development

Within the context of sustainable development, the responsible use of material resources is key.

This implies:

- Responsible primary material production →
- Efficient use →

VALID FOR ALL MATERIALS

- Reuse and recycling of materials resources →
- Use of permanent / renewable resources →

CLASSIFICATION OF MATERIALS

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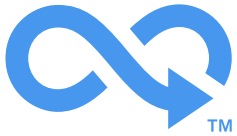
Old classification

Non renewable

Renewable

New classification

Non renewable



Permanent

Renewable

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Back to basics, back to the future

- Over the past 100 years, we have developed ever more complex materials.
- This complexity and diversity has made recycling increasingly challenging.
- Permanent materials consist of robust chemical components to make multiple recycling possible.
- After use, permanent materials go back to their roots as a raw material for new uses.

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Use rather than consume

- Permanent materials are not consumed, they are merely used.
- Permanent materials are moved from the ground or manufactured and used in a range of applications and then ’lent’ to other applications after their previous use.
- They can be recycled, over and over again, without loss of properties: multiple recycling.

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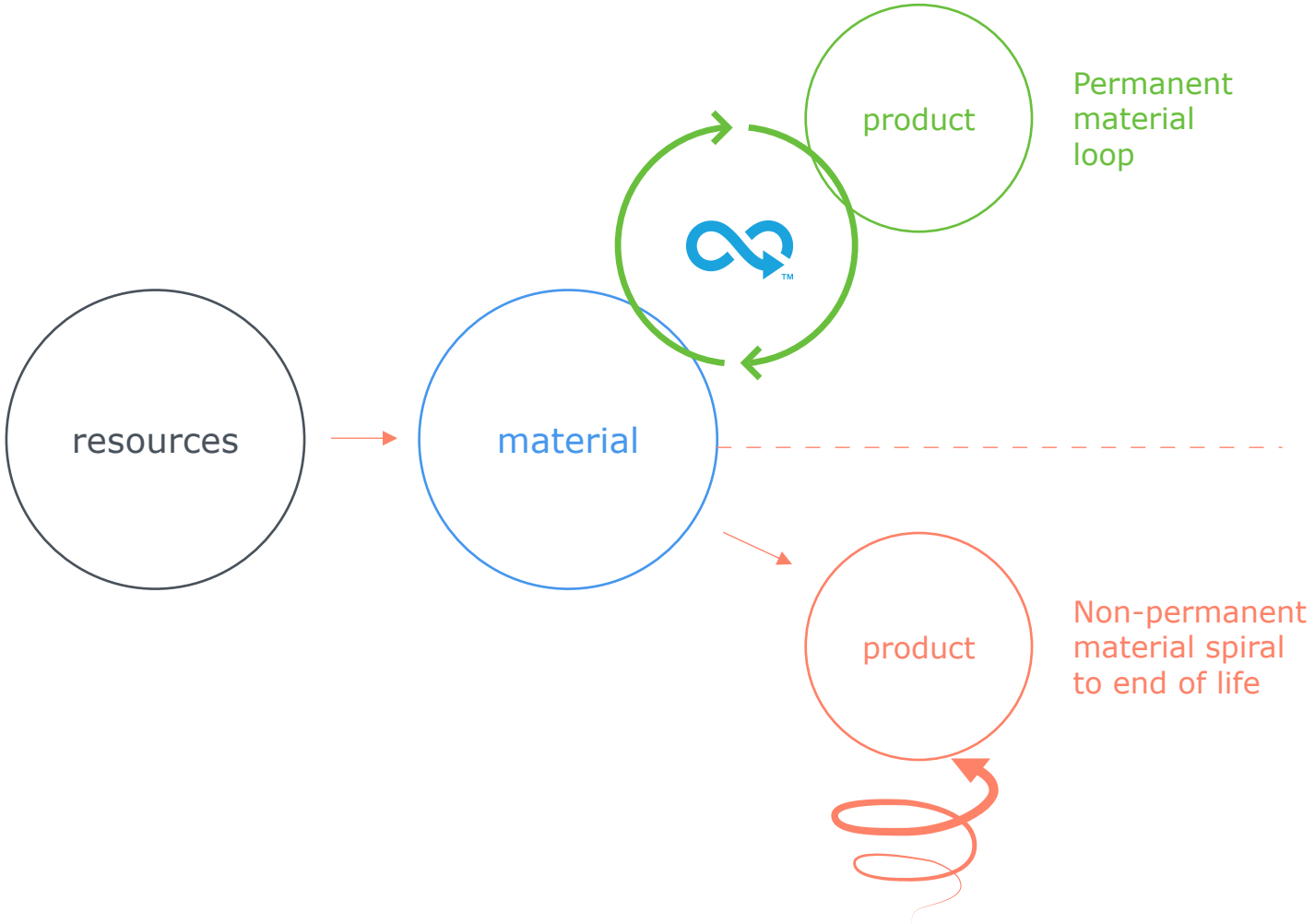
Definition

A permanent material is one for which the inherent properties do not change during use and regardless of repeated recycling into new products.

Its recycling does not necessarily require the addition of primary material or additives to enable the basic material function / or properties.



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Two pillars

The Concept Permanent Materials is based on two pillars

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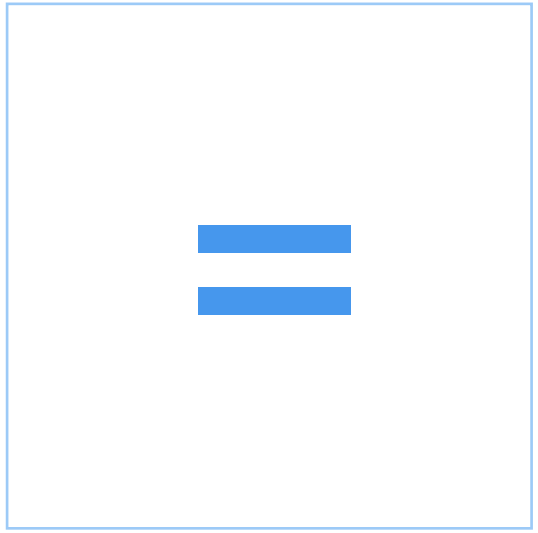
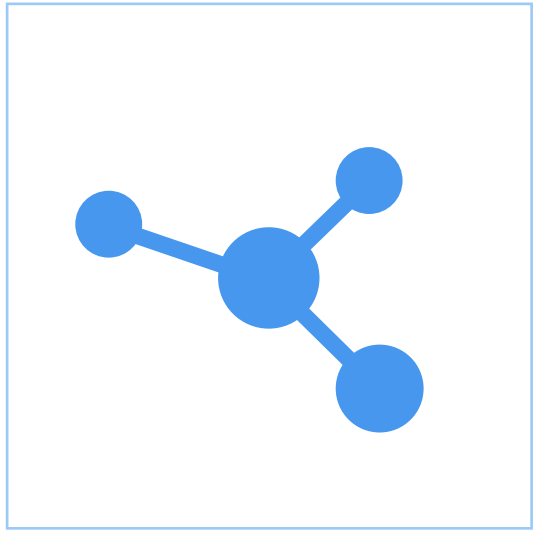
Properties of a permanent material

The first pillar of the Concept of Permanent Materials is the chemical structure

Inherit properties do not change during use or recycling



Material reverts to its initial state



Consists of basic components:

- Either chemical elements, or
- Robust chemical compounds

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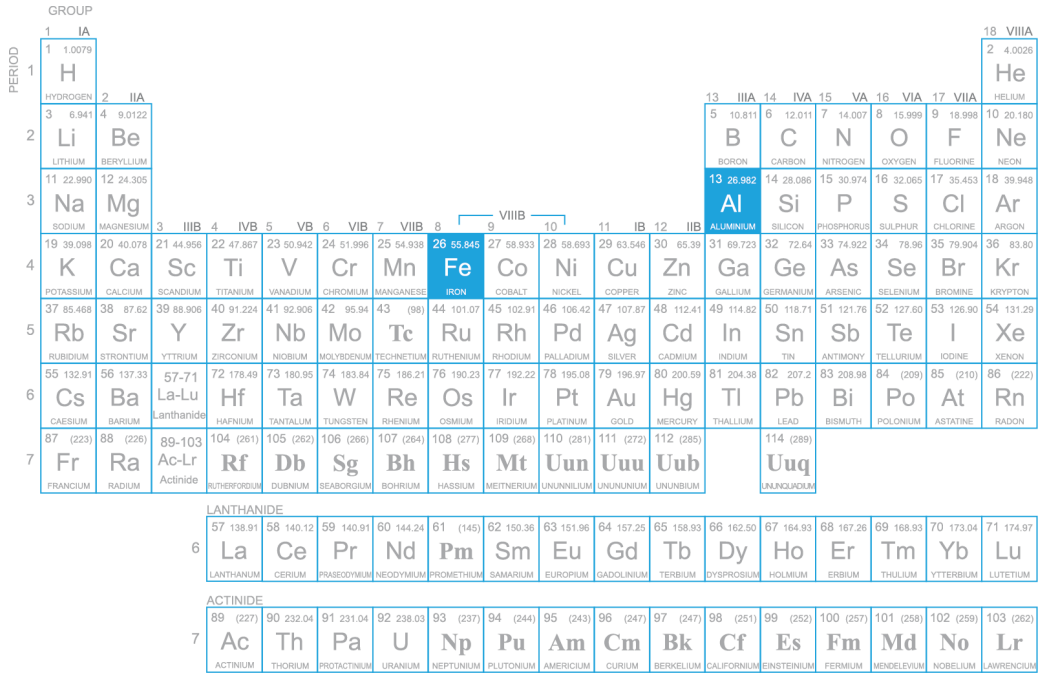
It’s elementary, my dear Watson



- Aluminium and iron are an element of the periodic table.
- When scrap is melted to be recycled, it will be identical to primary Aluminium or Iron.
- No quality loss, it recycles forever.

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Chemical structure: the name is bond

- Bonding forces of the molecules is key for permanent materials.
- The bonding forces between the atoms in the molecule has to be stronger than the forces between the molecules.
- This strong bonding force safeguards the inherent characteristics of the material and enables multiple recycling through melting or even vaporizing.

Material stewardship

The second pillar of the Concept of Permanent Materials is how they are used:

The material must contribute to sustainable development.

It should be technically available for recycling.
(for example materials used in medical pills are no longer available and can thus not be recycled)

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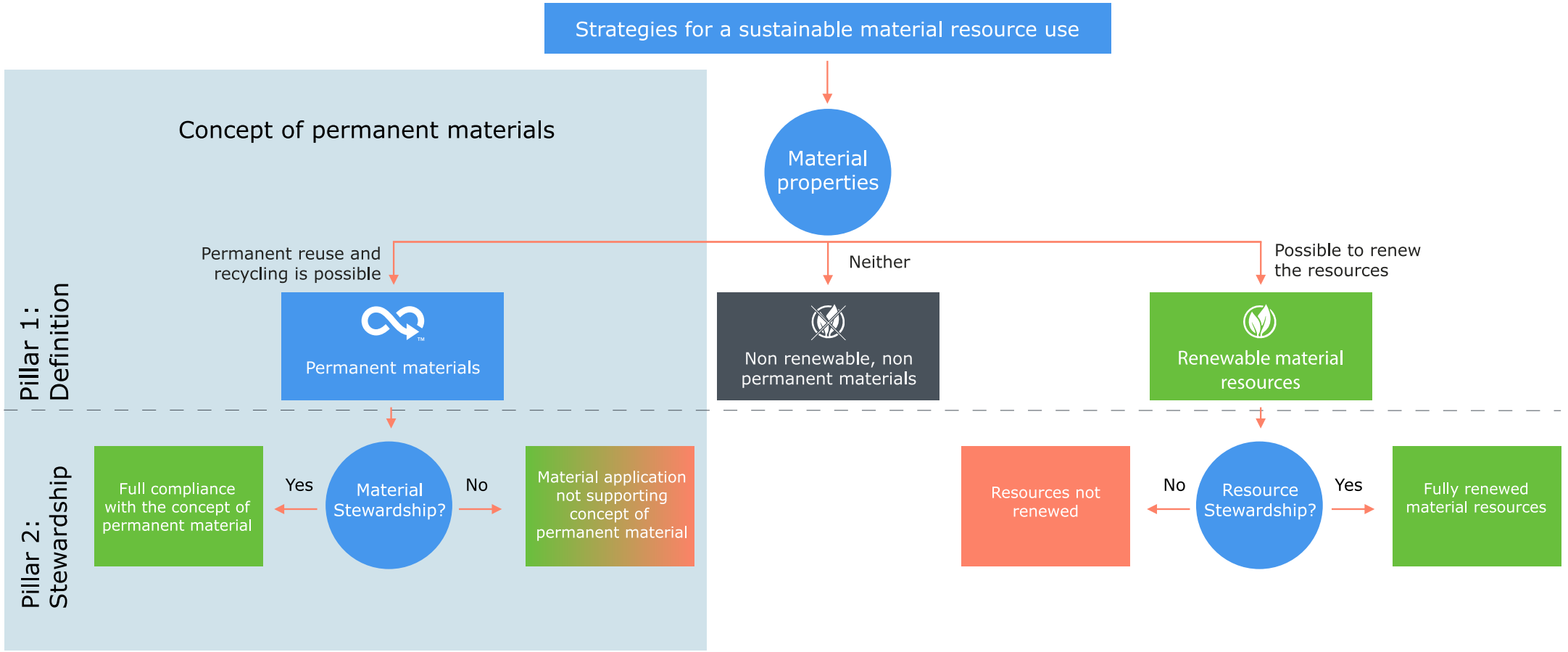
Material Classification according to sustainable development strategies



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Metal, a true recycling story

- 80% of all metal ever produced is still in use today. Today's can could become part of tomorrow's train or building.

- Where efficient recovery systems are in place, recycling rates exceed 90%.

- Recycling one tonne of metal scrap uses 70-95% less energy than making one tonne of metal from virgin raw material.

- Metals close the material loop without being confined to a single application.

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