Circular Metals
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Circular Metals

- 10–20% pollution, energy use, GGE from manufacture of metals and metal products

- 90% steel and aluminium alloys; 90% construction, transportation and packaging industries

- Current world production approx. 2B tonnes, increasing to 2.5B tonnes by 2050

- Cannot remove or replace: must recycle, reuse, extend life
- New generic materials: “multicomponent alloys”

- Extended lifetime: ”metal health service”

- Better recycling

- Re-use of vehicles, buildings etc.

- New business models: “Metals as a service”
Multicomponent alloys

- 5,000 alloy grades, each finely tuned for each specific component
- Multicomponent alloys for multiple functionality, multiple use, resilience
Metal health service

- Regular treatment to prevent and (later) remove initial damage
- Extends lifetimes by between 2–4 times

<table>
<thead>
<tr>
<th>Alloy</th>
<th>Damage</th>
<th>Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless steel</td>
<td>LCF fatigue</td>
<td>2 X</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>HCF fatigue</td>
<td>3.4 X</td>
</tr>
<tr>
<td>Cast aluminium alloy</td>
<td>HCF fatigue</td>
<td>2 X</td>
</tr>
</tbody>
</table>

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Metals as a service

- Many sectors components are replaced automatically on a rota
- Develop business model for service companies to supply functionality
Enough metal is in circulation
We aim to remove mining and EOL

Thank you!

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