

**Strategic Materials for a Low-Carbon Future: From Scarcity to Availability**  
**2-3 November 2017 – Session Summary**

**Breakout 1d: Copper and aluminium in the low-carbon world**

Copper and aluminium provide the building blocks for both industrial and economic growth, and are also key for new energy technologies. Will the demand landscape for common metals be radically different from past use? What are future trends of substitution in the search for lower-carbon uses, for instance magnesium for aluminium, or fibre optics for copper? Can the proportion of metal coming from secondary sources increase in the future?

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- In this session, speakers outlined the basic factors driving demand and supply of copper and aluminium. These metals are the 'unsung heroes' of the low-carbon transition due to their uses in power transmission, vehicle bodies and batteries, roads and other infrastructure. Such uses have a long life-span of up to 40-50 years, if not more.
- The UNEP's Green Technology Choices report found that low-carbon technology places added pressure on demand for metal resources such as copper and aluminium. By mid-century, there may well be a resource constraint on copper, whereas the challenge for aluminium in long term supply is energy.
- One source of demand for aluminium and copper in particular is the automotive industry. If the US auto market switched from steel to aluminium in SUVs, pickups, MPVs and elsewhere where it is not already used, auto sector demand for aluminium would balloon - equating to 40-70% demand growth in the US and Western Europe. As for copper, hybrid electric vehicles use 30 kg of copper per unit, while battery electric vehicles use 60-80 kg per unit.
- In terms of supply, ore grades are deteriorating, so additional cost per kg of metal extracted is rising. There are few substitutes for copper and aluminium that are sufficiently abundant for modern industrial needs.

By 2050, low-carbon technologies will be an estimated 10% of current resource impacts - so whilst there is clear additional pressure, for which solutions will be needed, there is little reason to panic.