

## **POTENTIAL FOR MATERIAL SYSTEMS BEYOND SUPERALLOYS**

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Systems beyond nickel based superalloys are being researched and considered. The opportunities and challenges for these materials will be considered along with the likely compromises likely to be necessary.

There is a continued pressure for cost and environmental reasons to reduce the emissions and this leads to the requirement for high temperature materials. These requirements have been met by continued improvements in nickel based superalloys for many years. However, for reasons including sustainability, cost, density and phase instability the scope for further improvement is very limited. There are therefore opportunities for successor systems.

The challenges should not be underestimated. Gas turbine materials need to have a balance of physical, mechanical and environmental properties to meet the required safety and performance requirements as well as having acceptable cost and a sustainable supply.

Successor material systems will have some different characteristics to nickel based superalloys and some changes to design philosophy are likely to be required. A good mutual understanding between materials and design communities is therefore required.