COMBUSTION WEBINAR

Opportunities & challenges in the transformation of high temperature process heat to net-zero CO_2 emissions

Speaker: G.J. 'Gus' Nathan, The University of Adelaide

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Abstract: The transformation of the high temperature process industries, which are used to produce materials vital to the global economy such as steel, cement and aluminium, will require the development of entirely new suite of technologies spanning the production and utilisation of low-carbon fuels, to electrification, the use of concentrated solar thermal heat and the capture/re-use of CO_2. The range of technologies needed for this sector will be diverse, owing to the bespoke nature of each process plant and to the need to begin demonstrate technologies that can retrofitted to existing processes to avoid excessive risk. The presentation will begin with an overview of the drivers and opportunities for the sector and then address key challenges in research associated with the technologies needed to decarbonise this sector, focussing particularly on the iron/steel, cement/lime and alumina/aluminium industries.

Biography: Professor Gus Nathan is the inaugural Energy Professional of the Year from the Australian Institute of Energy, SA, a Fellow of the Combustion Institute, a recipient of a Discovery Outstanding Researcher Award from the Australian Research Council and an ATSE KH Sutherland medallist. As the founding Director of The University of Adelaide's Centre for Energy Technology and Deputy Director of the Institute of Mineral and Energy Resources, he has led the University's growing focus on the low-carbon transition for heavy industry. He has led the development of six technology platforms, one of which is the flame for Sydney Olympic Relay Torch. Professor Nathan leads the Alternative Applications program in the $87m Australian Solar Thermal Research Initiative, which aims to lower the cost of solar fuels production, and a $14m ARENA funded project to introduce concentrating solar thermal into the Bayer Alumina process. He has published more than 250 papers in international journals, 240 in peer reviewed conferences, 50 commissioned reports and 11 patents.

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