

# Decarbonized Combustion: Research Needs for Zero Pollution

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**Abstract** - Climate change is the biggest challenge that our society faces. In order to deliver the required reduction of carbon emissions, a smooth transition is needed from the existing infrastructure to a new approach that is yet to be agreed at an international level. As a consequence, combustion technologies are expected to remain important during the development of new infrastructure over the next 30 years. However, combustion technologies must be in a position to deliver zero pollution, which include carbon, NO<sub>x</sub> and particulates and other substances, specific to different industrial processes. The talk will identify and review different combustion technologies that can deliver net zero carbon emissions and overall zero pollution within short and medium timescales, which include:

1. Hydrogen and its vectors (e.g. Ammonia)
2. Supercritical CO<sub>2</sub>
3. Solar or e-fuels
4. Metal nanoparticle fuel

The relevance of these approaches to aviation, land and marine transport and power generation will be considered. The scientific challenges that future research must address in order to deliver these combustion technologies will be presented.