Combustion TCP Highlights

Policy messages

- A roadmap for future fuels, supported by clear government policy commitments, is needed. Lack of it is a significant impediment to the decarbonization of combustion technologies.
- Continue support of combustion research is essential to a low-carbon energy future. Combustion continues to be a significant part of the world energy mix, a trend that will continue for the foreseeable future. Moreover, certain energy sectors will be hard to electrify. Advanced clean and efficient combustion technologies operating on sustainable, zero- to low-carbon fuels offer the potential for low-carbon emissions in all energy sectors in the future.
- Thermal runaway/battery fires are a critical intersection between the combustion and electrification fields.

Achievements / Ongoing Activities

- Italy joined as a new member.
- A combustion research "trends and needs" survey in each member country was completed. The survey is guiding our continued transition toward research in support of sustainable, clean, and efficient combustion technologies.
- Completed studies have now confirmed that current gas turbines operating on natural gas/H_2 mixtures containing up to 20-30% H_2 can be a first step into a H_2-based economy.
- Early results suggest that with optimized staged-combustion and pre-cracking of NH_3 into H_2 and N_2, good combustion and a substantial reduction in NOx emissions can be achieved for all NH_3 applications (engines, turbines, furnaces, and process heaters).

Dissemination and Outreach

- Organized the TCP Annual Spray Workshop (April 4, 2022, SAE World Congress in Detroit, ~40 participants).
- Visibility in the scientific community continues with extensive publications of TCP research in peer reviewed journals and presentations at conferences. (A list of publications is available at https://www.ieacombustion.com/meetings-publications/tcp-publications/)
- Held first post pandemic in-person 3-day Task Leaders Meeting in Japan with a hybrid option. More than 45 presentations and 40 participants.

Collaboration and Co-Operation

- In support of the IEA GREET+ Extension Project, a lifecycle analysis of hydrogen-fueled ICEs in collaboration with the AMF and Hydrogen TCPs has been initiated.
- TCP members serving as organizers, leaders and/or active participants in external meetings/ consortium/workshops continue to bring IEA/TCP perspectives, influence, and visibility to the broader community. (*e.g.*, 1st Symposium on Ammonia Energy, Sep. 1-2, 2022, Cardiff, UK , ~300 participants)