

**Dutch Section of the Combustion Institute  
WEBINAR 19**

**Friday April 26, 2024, 13:00-14:00 (CET)**

**From non-premixed combustion in industrial furnaces to lean  
premixed combustion in gas turbines:  
a comprehensive review, updates, and reflections on low-emission combustion applications  
and project management**

**By Shanglong Zhu  
Longway Energy**

**ABSTRACT:**

Over the past three decades, High Temperature Air Combustion (HiTAC), Moderate or Intense Low Oxygen Dilution (MILD), Flameless or Distributed combustion have emerged as leading technologies for fossil fuel conversion in industrial furnaces, enabling energy conservation and emission reduction. Concurrently, lean premixed combustion has gained dominance in the gas turbine industry with various iterations at prominent companies. In recent years, there has been an increasing focus on ultra-low emission and Hydrogen combustion technology due to stringent standards. This lecture provides a concise history of these combustion concepts and technologies along with their industrial applications and engineering considerations. Additionally, it presents some research updates and reflections during project management in the fast-changing market.

**Short CV:**

Dr.ir.MBA Shanglong Zhu is a member of the Combustion Institute, ASEM, IEEE, and PAiE. He obtained two bachelor's degrees in Building Environment and Equipment Engineering and Computer Science and Technology from Tianjin University in 2003, as well as a master's degree in Engineering Thermophysics from Tongji University in 2006. Following this, he gained experience working on R&D projects related to software development, burners for pulverized coal gasification, and retrofitting combustion systems for industrial boilers and furnaces at Shanghai Marine Diesel Engine Research Institute (CSSC). In 2009, he started his PhD research focused on spray combustion under HiTAC conditions in the frame of a joint project between Twente University and TU Delft, and industrial partners. This teamwork provided him the opportunity to acquire good understanding of the synergy between numerical simulation and experimental tests. With extensive knowledge of gaseous, liquid, and solid fuel combustion across various applications, he joined Ansaldo Thomassen in 2014. Therein, his responsibilities included retrofit design oversight; manufacturing supervision; control logic design; selection of instruments & components; construction of test benches; testing activities; on-site commissioning; after-sales maintenance support for heavy-duty gas turbines such as Frame 5s, 6Bs, 9Es and GT26s. In 2020, he completed his EMBA program at Erasmus University while simultaneously embarking upon entrepreneurship with Longway Energy during the pandemic period. He maintains connections with academic institutions and industry partners to provide technical services along with management support. For instance, he manages two groups of talents engaged in product development activities within a software engineering company (SmartMed) while also serving as a senior technical expert responsible for supporting R&D initiatives concerning gas turbine parts and systems.

Participation is free.

Members can join without pre-registration.

Non-members are kindly requested to pre-register by sending email to [combustioninstituteNL@gmail.com](mailto:combustioninstituteNL@gmail.com).

After the presentation there will be time for question and comments.

The presentation will be recorded, but not the discussion afterwards.

The link for joining the webinar will be made available later.