



**TNCHE Asia 2025 Conference**  
**" Accelerating Industrial Decarbonization:**  
**Digital-AI and Energy Transformation "**  
**Presenter's Biodata & Abstract**



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**Title of Presentation** : Energy Efficiency and Reliability -Spiral Tube Heat Exchanger

**Presentation Abstract:**

The spiral tube heat exchanger (STHE) is designed with a helical tube bundle housed within a cylindrical pressure vessel, enabling highly efficient heat transfer. This countercurrent heat exchanger configuration optimizes energy exchange by ensuring opposite fluid flow directions on the tube and shell sides. The flexible spiral-wound bundle expands and contracts during start-up and shutdown, eliminating mechanical stress and making it highly reliable under process fluctuations.

STHE technology offers superior resilience to thermal and pressure shocks, unrestricted cooling and heating rates, and the ability to replace multiple traditional heat exchangers, reducing installation costs and space requirements. With heat transfer efficiencies two to three times higher than conventional shell-and-tube exchangers, STHE enables precise temperature control and significant energy savings.

The helical flow pattern inside the tubes generates secondary vortices that enhance heat transfer, while the shell-side turbulence minimizes fouling. The heat exchangers accommodate various high-performance materials, including stainless steel, titanium, and high-nickel alloys, ensuring durability under extreme temperatures and pressures.

With its robust design, high efficiency, and proven reliability, STHE technology continues to be a key solution for demanding industrial applications worldwide.