

Senior CFD Engineer

Tulum Energy is an early-stage technology company developing an innovative Turquoise Hydrogen pyrolysis solution for clean and inexpensive hydrogen production. Our platform technology will have a major impact in our world's attempt to decarbonize by reducing greenhouse gas emissions. As we race towards this critical goal, we are building a team of world class individuals that are comfortable working at a start-up company, are innovators and have a passion for climate change.

We are currently looking for a **Senior CFD Engineer**. In this role you report directly to the Chief Technical Officer, to develop, analyze and optimize existing and future reactor concepts to achieved key performance indicators (KPIs). Specific details are below.

Primary Responsibilities:

- Develop analytic CFD models, both reacting and non-reacting, steady and unsteady to explore, optimized and evaluate competing reactor concepts based around Tulum's proprietary pyrolysis technology to achieve key performance metrics including mixing uniformity, ignition reliability and high hydrogen and carbon output yields
- As part of a team, help develop novel new reactor concepts from the ground up for future generation product offerings
- Using Cantera, Chemkin or the like, develop reduced order kinetic models of the reactor/combustor assembly to calculate key performance outputs and conduct critical sensitivity studies based on operating state points
- Perform detailed thermal, combustion, mass and energy balance analyses and calculations
- Support the design, assembly and testing of a lab scale, proof of concept thermal reactor/combustion systems and use the results to calibrate concurrent analytic models
- Help generate key Intellectual Property for the company to increase its Patent Portfolio and technology protection

- Work with the existing team to assemble, build, commission and operate the model prototype reactor(s) and validate against concurrent CFD and analytic models

Minimum Experience:

- Masters Level Mechanical Engineer Degree (or equivalent) with 15+ years relevant experience in the analytic design of thermal, reacting and fluids systems including, but not limited to, thermal reactors/oxidizers, gasifiers, gas turbine combustion systems (land based or commercial), boiler burners, process heaters, rockets, etc.
- Solid understanding of Methane Pyrolysis, specifically Turquoise Hydrogen Production
- Thorough understanding of thermodynamics and reacting and non-reacting fluid dynamic flows including, but not limited to the following:
 - Premixed and Diffusion flames
 - Reaction Kinetic Mechanisms
 - High Speed flow
 - Conjugate heat transfer
 - Advanced Fuel-air mixing concepts and optimization
 - Gas Fuel Injections
 - Swirling flows
- Advanced expertise in a variety of CFD solvers including Ansys Fluent, CD Adapco, CFX, Open Foam, or equivalent
- Advanced expertise in a variety of kinetic and equilibrium solvers as Cantera, Ansys Chemkin, Gaseq, or the like
- Experience with reduced order kinetic models integration into CFD solvers
- Provide accurate and detailed reports of CFD results
- Exceptional communication skills both written and verbal; ability to present results in front of a group of peers
- Support Design Team in product design and development activities
- Ensure that product design and performance meets technical and functional requirements
- Ability to work independently and as part of a team
- Mechanical aptitude, hands on, and the desire and capability to lead a team if needed

Additional Experience Desired:

- Ability to read and interpret CAD and P&IDs drawings
- Intermediate experience with CAD packages such as CATIA, Solid Works, AutoCAD, CREO or the like and associated GD&T standards
- Hands on experience using and operating flammable gases and operating combustion test rigs including data analysis and processing
- Experience with both high and low speed instrumentation (dynamic pressure and temperature sensors), flow meters, regulators, etc.
- Experience with process control system hardware and DAQ software (DCS, HMI, PLC, National Instruments),
- Versed in such software and programming tools as MATLAB, Python, C++, or the like

Location

The position is preferably based in Milan Italy, but some remote working arrangements will be considered with periodic visits to Milan as needed.

Tulum Energy

Tulum Energy is an early stage and dynamic Start-up Company. Our Standard employment package includes a base salary, Stock Options, Vacation and Health Insurance. For the current opening:

- Salary Range: \$90,000–\$150,000
- Permanent Full-Time Position