Flexible thermodynamic power cycles for efficient waste heat recovery

Date: Sun. 8th Dec.
Time: 1:10 pm
Location: Building 59, Room 2016

Speaker:

Professor Yu Zhibin
School of Engineering,
Glasgow, UK

Abstract:

It is estimated that up to 50% of industrial energy input in the world is discharged as waste heat in the form of hot exhaust gases, cooling water, and heat lost from hot equipment surfaces and product. Recovering and utilizing such waste heat could significantly improve the energy efficiency of our industrial sectors. Although waste heat recovery is broadly welcomed by industry, there is a lack of implementation of waste heat efficient energy recovery systems due to various barriers, one of which is lack of efficient energy recovery equipment. While there are several alternative technologies for waste heat recovery, the organic Rankine cycle systems are believed to be the most promising technology in practice. Large ORC systems are commercially viable for high-temperature applications. However, the application of ORC systems to lwo-temperature waste heat at relatively small scale is considered to be in its infancy due to the low efficiency. Yet, most industrial waste heat sources are in the low temperature band. This talk will introduce the dynamic organic Rankine cycle concept that was recently proposed and developed by the speaker's team. Such cycles use a zeotropic mixture as working fluid, with a composition system, can adjust the composition of the mixture in situ to closely match the changing ambient temperature, so that the system efficiencies can be improved.