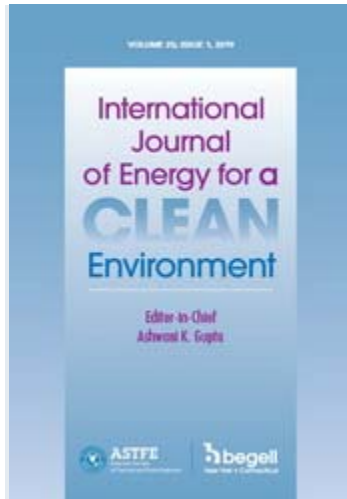


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## **EVALUATION OF THE ENVIRONMENTAL IMPACT OF ENERGY SOURCES FOR A THERMAL POWER PLANT**

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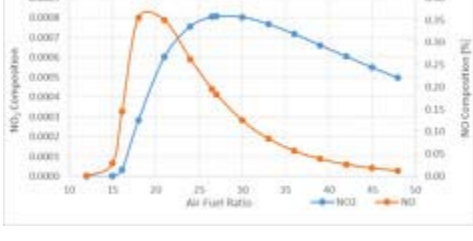
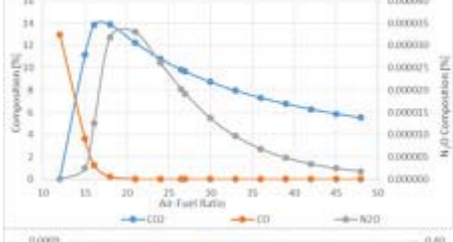
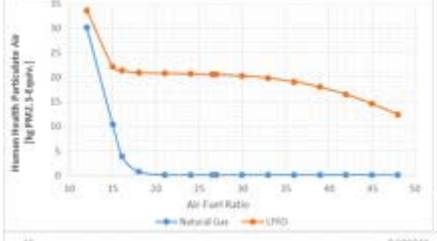
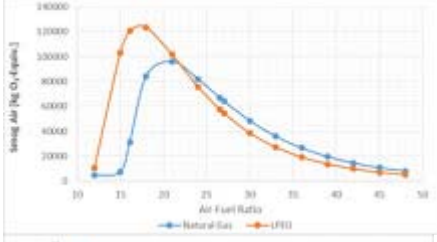
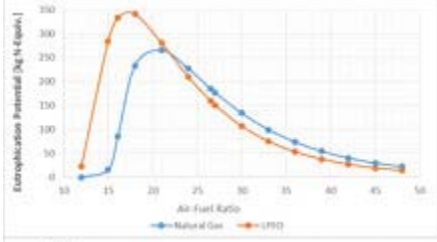
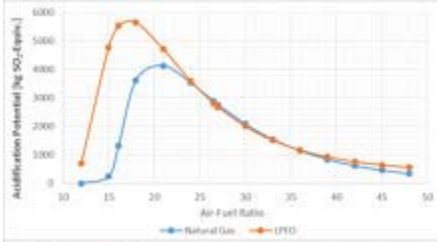
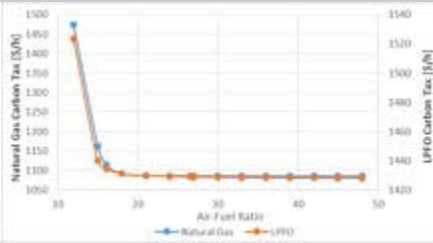
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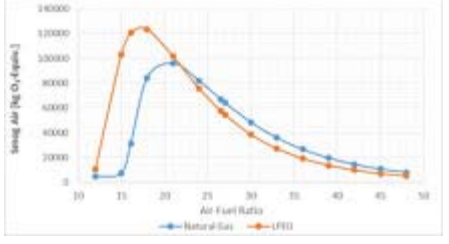
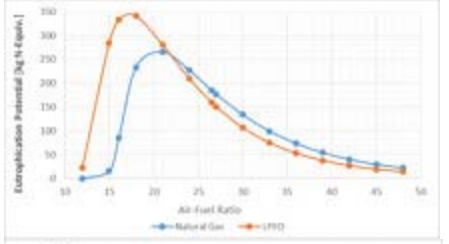
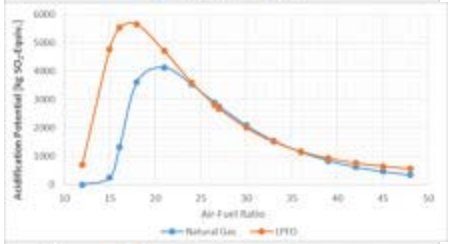
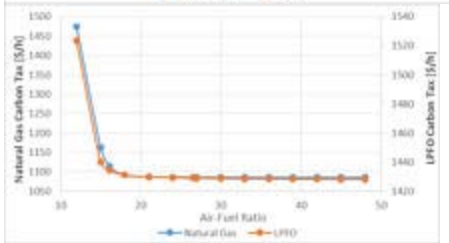
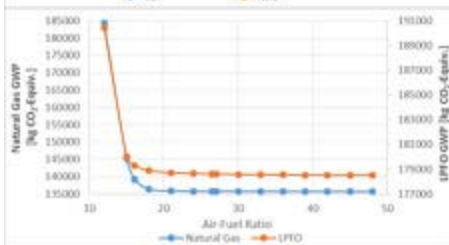
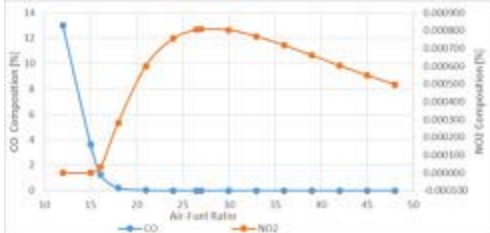
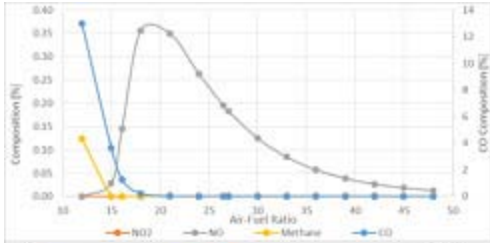
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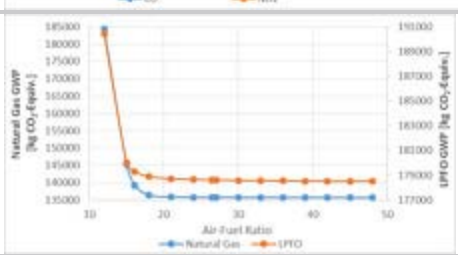
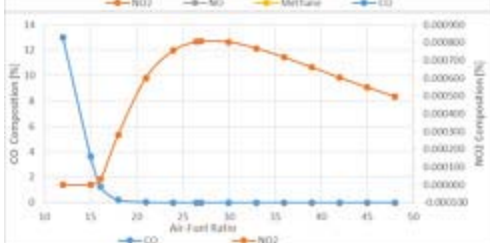
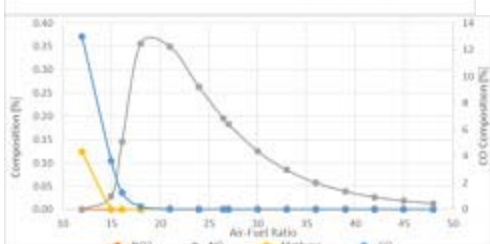
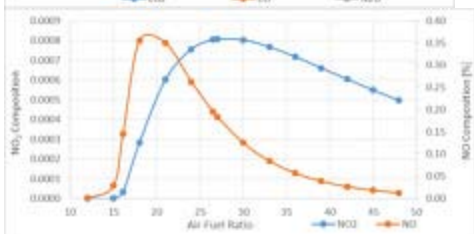
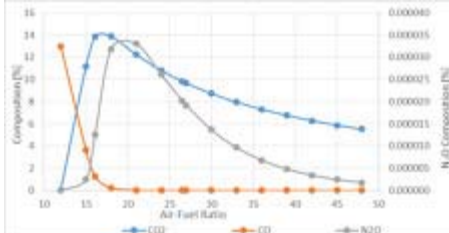
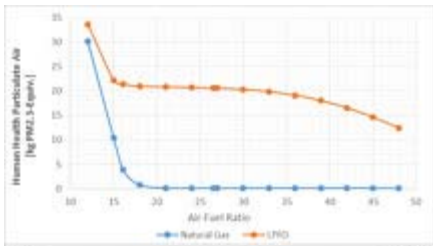
## ABSTRACT

Conserving the dwindling energy sources and preserving the environment are pertinent twin sustainable development issues in climes where renewable energy techniques have not matured. While the use of viable alternative sources of fuels has been identified as being able to minimize the occurrences of power outages caused by short supply and non-availability of the primary fuel for generating electricity in the thermal power plants, the use of operating conditions which are favorable from both thermodynamic and environmental viewpoints is equally essential for the preservation of energy sources and the environment. In this work, air-fuel parametric studies on low-pour fuel oil (LPFO) as an alternative to natural gas in electricity generation were conducted based on environmental impacts. Typical emissions from a boiler designed to fire both fuels were simulated with HYSYS 8.8. The potential environmental impacts (global warming, eutrophication, acidification, air smog, and human health particulate) were simulated using GaBi. The outcomes of the studies show that an air-fuel ratio of 16.1 previously prescribed in earlier work from a thermodynamic viewpoint was not favorable to all the environmental indicators considered. A more informed decision on the choice of air-fuel ratio for fuel combustion can be achieved by developing a robust and encompassing pollution tax.

## Figures







**KEY WORDS:** [fossil fuels](#), [operating conditions](#), [power generation](#), [emissions](#), [impact categories](#), [pollution tax](#)

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