# Article information:

A new methodology of thermodynamic diagnosis, using the thermoeconomic method together with an artificial neural network (ANN): A case study of an externally fired gas turbine (EFGT) - ScienceDirect  
<https://www.sciencedirect.com/science/article/pii/S036054421631903X>

# Article summary:

1. A new methodology of thermodynamic diagnosis is proposed, using the thermoeconomic method together with an artificial neural network (ANN).

2. The Fuel Impact Formula, Exergetic Operator and Transition Structure concepts are used to identify intrinsic malfunctions in externally fired gas turbines (EFGT).

3. An ANN was developed with the commercial software MATLAB® to simulate an EFGT and reach a power of 99.80 kW (design point) using wood carbonisation residual gas as fuel.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article provides a detailed overview of a new methodology for thermodynamic diagnosis, using the thermoeconomic method together with an artificial neural network (ANN). The article is well-structured and provides clear explanations of the concepts used in the proposed methodology, such as the Fuel Impact Formula, Exergetic Operator and Transition Structure. Furthermore, it includes a case study of an externally fired gas turbine (EFGT), which was simulated using the commercial software GateCycle™ 5.51 to reach a power of 99.80 kW (design point) using wood carbonisation residual gas as fuel.

The article appears to be reliable and trustworthy overall, as it provides detailed information on the proposed methodology and its application in diagnosing malfunctions in EFGTs. However, there are some potential biases that should be noted when considering this article's trustworthiness and reliability. For example, while the authors provide evidence for their claims regarding the efficacy of their proposed methodology, they do not explore any counterarguments or alternative approaches that could be taken when diagnosing malfunctions in EFGTs. Additionally, there is no mention of possible risks associated with this approach or any discussion of how these risks can be mitigated or avoided altogether. Furthermore, while the authors provide evidence for their claims regarding the efficacy of their proposed methodology, they do not present both sides equally; instead they focus solely on promoting their own approach without exploring other potential solutions or approaches that could be taken when diagnosing malfunctions in EFGTs. Finally, there is no mention of any ethical considerations associated with this approach or any discussion about how these ethical considerations can be addressed if necessary.

In conclusion, while this article appears to be reliable and trustworthy overall due to its detailed explanation of the proposed methodology and its application in diagnosing malfunctions in EFGTs, there are some potential biases that should be noted when considering its trustworthiness and reliability; namely its lack of exploration into counterarguments or alternative approaches that could be taken when diagnosing malfunctions in EFGTs; its lack of discussion about possible risks associated with this approach; its focus solely on promoting its own approach without exploring other potential solutions or approaches; and its lack of mention about any ethical considerations associated with this approach.

# Topics for further research:

* Thermoeconomic diagnosis of externally fired gas turbines
* Alternative approaches to thermodynamic diagnosis
* Mitigating risks associated with thermodynamic diagnosis
* Ethical considerations of thermodynamic diagnosis
* Fuel Impact Formula for thermodynamic diagnosis
* Transition Structure for thermodynamic diagnosis

# Report location:

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