Review: *Investigation of relative influence of process variables in a 10-kW downdraft fixed-bed gasifier with ANN Models*



## Request for Review

You have been selected as a potential reviewer of the following submission. Below is an overview of the submission, as well as the timeline for this review. We hope that you are able to participate.

### Article Title

Investigation of relative influence of process variables in a 10-kW downdraft fixed-bed gasifier with ANN Models

### Abstract

Biomass gasification is considered among promising solutions for renewable energy generation. The process converts the biomass, such as rice husk, to synthetic gas (syngas). It produces CO, $CO_2$, $CH_4$, and $H_2$ gas that are useful for internal combustion engines. The process is complicated to control. Hence, a thorough knowledge of this process is needed. One of the approaches to reveal the control parameters of the gasifier is using an artificial neural network (ANN). In this research, an ANN model is deployed from experiments that measure combustion temperature, intake, and discharge airflow rate as input variables. The output of this model is to predict the increase of combustion temperature in the reactor as this parameter is crucial for the design of an automated control system. From the two experiments, the models produce satisfying accuracy ($R^2$ = 0.832 and 0.911) and relatively low errors (RMSE values of 0.250 and 0.098). The neural network itself is used to analyze the significant control parameters by the permutation importance method.

### Review Type

Double-blind

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### Review Schedule

| 2021/10/14 | 2021/10/28 | 2021/11/30 |
|---|---|---|
| *Editor's Request* | *Response Due Date* | *Review Due Date* |

About Due Dates

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Review: *Investigation of relative influence of process variables in a 10-kW downdraft fixed-bed gasifier with ANN Models*



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199330-1 Article Text, Investigation of Relative Influence of Process Variables in a 10 kW downdraft fixed(NoAuthor).docx 2021/10/13 Article Text

## Review

Enter (or paste) your review of this submission into the form below.

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*For author and editor*

Upload

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Upload files you would like the editor and/or author to consult, including revised versions of the original review file(s).

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Select a recommendation and submit the review to complete the process. You must enter a review or upload a file before selecting a recommendation.

Revisions Required

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Review: *Investigation of relative influence of process variables in a 10-kW downdraft fixed-bed gasifier with ANN Models*



## Review Submitted

Thank you for completing the review of this submission. Your review has been submitted successfully. We appreciate your contribution to the quality of the work that we publish; the editor may contact you again for more information if needed.

**Review Discussions** Add discussion

| Name | From | Last Reply | Replies | Closed |
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| — | mhmmdfaizal 2021/11/25 08:18 PM | - | 0 | ☐ |

Muhammad Faizal <muhammadfaizal@unsri.ac.id>

# [JAES][ID 34344] Article Review Request

1 pesan

**SCIndeks Asistent** <ceoncees@gmail.com> 15 Oktober 2021 01.12
Kepada: Muhammad Faizal <muhammadfaizal@unsri.ac.id>

Dear Muhammad Faizal,

I believe that you would serve as an excellent reviewer of the manuscript, "Investigation of relative influence of process variables in a 10-kW downdraft fixed-bed gasifier with ANN Models," which has been submitted to Journal of Applied Engineering Science. The submission's abstract is inserted below, and I hope that you will consider undertaking this important task for us.

Please log into the journal web site by 2021-10-28 to indicate whether you will undertake the review or not, as well as to access the submission and to record your review and recommendation.

The review itself is due 2021-11-25.

Submission URL: https://aseestant.ceon.rs/index.php/jaes/reviewer/submission?submissionId=34344&reviewId=48917&key=zYn6ha2R

"Investigation of relative influence of process variables in a 10-kW downdraft fixed-bed gasifier with ANN Models"

Abstract

Biomass gasification is considered among promising solutions for renewable energy generation. The process converts the biomass, such as rice husk, to synthetic gas (syngas). It produces CO, $CO_2$, $CH_4$, and $H_2$ gas that are useful for internal combustion engines. The process is complicated to control. Hence, a thorough knowledge of this process is needed. One of the approaches to reveal the control parameters of the gasifier is using an artificial neural network (ANN). In this research, an ANN model is deployed from experiments that measure combustion temperature, intake, and discharge airflow rate as input variables. The output of this model is to predict the increase of combustion temperature in the reactor as this parameter is crucial for the design of an automated control system. From the two experiments, the models produce satisfying accuracy ($R^2$ = 0.832 and 0.911) and relatively low errors (RMSE values of 0.250 and 0.098). The neural network itself is used to analyze the significant control parameters by the permutation importance method.

Thank you for considering this request.

Prof. Dr Gradimir Danon
Editor in Chief

Journal of Applied Engineering Science - JAES www.engineeringscience.rs

Muhammad Faizal <muhammadfaizal@unsri.ac.id>

# [JAES][ID 34344] Submission Review Reminder

1 pesan

**SCIndeks Asistent** <ceoncees@gmail.com> 25 November 2021 23.53
Kepada: Muhammad Faizal <muhammadfaizal@unsri.ac.id>

Dear Muhammad Faizal,

Just a gentle reminder of our request for your review of the submission, "Investigation of relative influence of process variables in a 10-kW downdraft fixed-bed gasifier with ANN Models," for Journal of Applied Engineering Science. We were hoping to have this review by 2021/11/25, and would be pleased to receive it as soon as you are able to prepare it.

Submission URL: https://aseestant.ceon.rs/index.php/jaes/reviewer/submission?submissionId=34344&reviewId=48917&key=a56bNsKM

Please confirm your ability to complete this vital contribution to the work of the journal. I look forward to hearing from you.

Gradimir Danon
Editor in Chief
gdanon@iipp.rs

Journal of Applied Engineering Science - JAES www.engineeringscience.rs

Muhammad Faizal <muhammadfaizal@unsri.ac.id>

# [JAES][ID 34344] Article Review Acknowledgement

1 pesan

**SCIndeks Asistent** <ceoncees@gmail.com> 26 November 2021 04.23
Kepada: Muhammad Faizal <muhammadfaizal@unsri.ac.id>

Dear Muhammad Faizal,

Thank you for completing the review of the submission, "Investigation of relative influence of process variables in a 10-kW downdraft fixed-bed gasifier with ANN Models," for Journal of Applied Engineering Science. We appreciate your contribution to the quality of the work that we publish.

Gradimir Danon
Editor in Chief
gdanon@iipp.rs

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