

# International Conference on Research in Natural and Engineering Sciences

November 14 – 15, 2020

**Konya, Turkey**

Oral Presentations

# Proceedings Book

[www.insackongre.com](http://www.insackongre.com)

**ISBN: 978-625-7767-86-6**



INSACKONGRE

## Editörün Notu/ Editor's Note

14-15 Kasım 2020 tarihlerinde düzenlenen Uluslararası Doğa ve Mühendislik Bilimlerinde Araştırma Konferansı (ICRNES 2020) Kongremiz yoğun bir katılım ile gerçekleştirilmiştir.

Kongremizde bilim dünyasının önemli isimleri akademik çalışmalarını sunmuş ve tartışma ortamı bulmuşlardır. Kongremize bizzat katılarak bizleri onurlandıran yabancı davetli konuşmacılarımıza özellikle teşekkür ederim.

Kongremize katılan ve ilgi gösteren tüm akademisyenlerimize teşekkür eder, gelecek kongrelerimize de katılımlarından onur duyarız.

International Conference on Research in Natural and Engineering Sciences (ICRNES 2020) held on November 14-15, 2020 with a great participation.

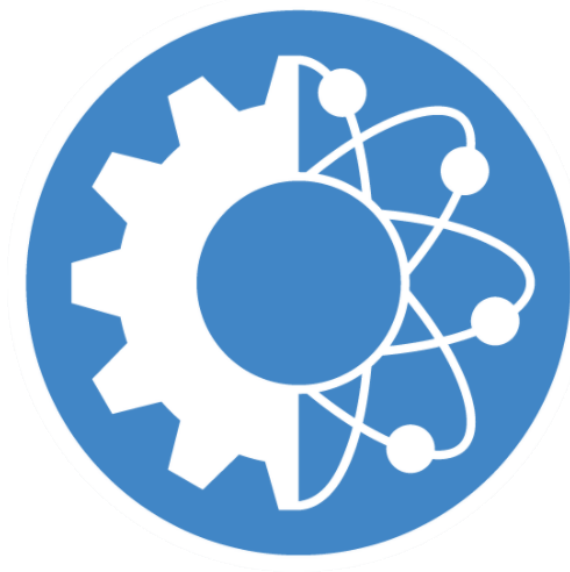
Important names of the scientific world presented their academic studies and found a discussion ambience. Especially, I would like to thank foreign invited speakers who joined us in insac congress.

We would like to thank all of academics who have participated in insac congress.



Doç. Dr. Mehmet Dalkılıç

insoc



**International Conference on Research in Natural and  
Engineering Sciences (ICRNES 2020)**

Life Cycle Assessment of Biobutanol From Miscanthus and  
Sorghum Feed Stocks (Secil Tutar Oksuz)

## Life Cycle Assessment of Biobutanol From Miscanthus and Sorghum Feed Stocks

Secil Tutar Oksuz<sup>1\*</sup>

<sup>1</sup>Konya Technical University, The Engineering and Natural Sciences Faculty, Environmental Engineering, Konya, Turkey, \*Corresponding author e-mail: stutar@ktun.edu.tr

---

**Abstract:** *The world faces an energy crisis since the demand for fossil fuels such as coal, oil, natural gas, is growing in most countries in the world. Meanwhile, concerns over the adverse effects of fossil fuel use on the environment and public health and its contribution to global warming are growing. In this context, biomass crops have great potential to displace fossil fuel to lower net greenhouse emissions, and to diversify the agroecosystems. Biobutanol, butanol produced from biomass, has a higher energy density than ethanol and thus would be a more advantageous fuel to substitute gasoline. The purpose of this study is to estimate the life cycle energy and butanol yield of the biobutanol production process, by examining the effects of nutrients and enzymes used in the process. This study employs the use of the full life cycle model GREET 1 2011 (Greenhouse gases, Regulated Emissions, and Energy use in Transportation) developed at Argonne National Laboratory (U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy). After we had obtained the results of the butanol production process based on the GREET model, we compared the butanol yield for different feedstocks, forage sorghum, and miscanthus while altering the nutrients and enzymes used for production. We predict that the various feedstocks, nutrients, and enzymes will affect the butanol yield in the well-to-wheel analysis of butanol production.*

**Key Words:** *life cycle assessment, biomass, biobutanol, sorghum, miscanthus*

---