

ISBN :



CONFERENCE PROGRAMS AND ABSTRACT

**ADVANCING SUSTAINABLE SCIENCE AND TECHNOLOGY
THROUGH EFFECTIVE COLLABORATION**

OCTOBER 20-21, 2021

**Palembang, Province of South Sumatera
Indonesia**

Organized By :



FOREWORD FROM GENERAL CHAIR 5th FIRST 2021 INTERNATIONAL CONFERENCE



Assalamu'alaikum wr wb,

Alhamdulillahirrobbil 'alamin, Thank to the God, almighty, due to His bless and love, we are granted good health and opportunity so that we can meet here in the event of the 5th FIRST and the 3rd SNAPTEKMAS 2021.

The honorable keynote speakers of the 5th FIRST and the 3rd SNAPTEKMAS 2021

Dra. Nana Yuliana, MA., Ph.D., as The Indonesian LBBP Ambassador for the Republic of Cuba, concurrently with the Commonwealth of the Bahamas, Jamaica, the Dominican Republic and Haiti

Prof. Ramaraj Boopathy. from U Alcee Fortier Distinguished Service Professor of Biological Sciences At the Nicholls State University, USA

Dr. Ing. Ahmad Taqwa, the Director of State Polytechnic of Sriwijaya.

The honourable keynote speakers, distinguished guests, all participants, ladies and gentlemen,

For the beginning of my speech, let me welcome all of you with my great warm hug. It is a great honor for me that you choose the 5th FIRST and the 3rd SNAPTEKMAS 2021 as your conference. I am so proud that the authors still become enthusiastic to develop the knowledge although in this pandemic situation. Let us still work hard to support the development of the world through the research, science, and technology in many parts of the knowledge, as what has been purposed by the FIRST conference itself.

In this occasion, I would like proudly to inform you that the 5th FIRST and the 3rd SNAPTEKMAS 2021 as the forum to share knowledge, to search, to find, and to enlarge the link with other industries and universities has attracted so many authors from abroad, such as from: Politeknik Tun Syed Nasir Syed Ismail; MARA University; Politeknik Mukah Sarawak; University Sultan Zainal Abidin, Terengganu, Malaysia; Politeknik Melaka (PMK) Malaysia; Iloilo Science and Technology University (ISAT-U) Philipina; Politeknik Kota Kinabalu; Universiti Teknologi Malaysia; The National University of Malaysia; National Chin-Yi University of Technology (NCUT); Accounting Research Institute UiTM-Malaysia; Management and Science University Malaysia; AlBaha University, KSA, Saudi Arabia; Politeknik Melaka (PMK), Malaysia; Kuantan Community College, Pahang, Malaysia; Universiti Brunei Darussalam; and Ferdowsi University of Mashhad, Iran.

Welcome to all of the researchers that become the collaborators in our research and community service. It is our great honour to have you as our collaborators and participants in the 5th FIRST and the 3rd SNAPTEKMAS 2021.

The honourable keynote speakers, distinguished guests, all participants, ladies and gentlemen,

In this chance, I would like to say thank you very much to the Director of State Polytechnic of Sriwijaya for his full support in the development of the Research and Service Community programs. Due to his hard work and his belief to all of the committee so that this event can be held.

In this occasion, I also would like to convey my big thank to all of the keynote speakers, invited guests, all the participants, all reviewers, and all committee of the 5th FIRST and the 3rd SNAPTEKMAS 2021. Without you all, this event will be nothing. May Allah SWT gives His reward for your sincerity. As the time goes by, it is hoped that our cooperation and coordination in the FIRST and SNAPTEKMAS can be maintained and improved. I hope that you can enjoy this conference and can get a big benefit from this event. I also wish that we can meet again in the forthcoming FISRT ad SNAPTEKMAS

Wassalamu'alaikumwaraahmatullahi wabarakatuh

FOREWORD FROM DIRECTOR OF STATE POLYTECHNIC OF SRIWIJAYA



The honorable, FIRST 2021 and SNAPTEKMAS 2021 keynote speakers,

Dra. Nana Yuliana, MA., Ph.D., as The Indonesian LBBP Ambassador for the Republic of Cuba, accredited to the Bahamas, Republic of Dominican, Republic of Haiti and Jamaica

Prof. Ramaraj Boopathy., from U Alcee Fortier Distinguished Service Professor of biological sciences at the Nicholls State University, USA

Dr. Ing. Ahmad Taqwa, MT., as Director of Politeknik Negeri Sriwijaya

Assalamualaikum wr wb,

Let us extend our gratitude to Allah SWT, the most gracious, the most merciful. Due to His bless, we can gather here, at the Opening Ceremony of the FIRST 2021 and SNAPTEKMAS 2021

First of all, Please let me deliver my warm welcome to all keynote speakers and all participant of FIRST 2021 and SNAPTEKMAS 2021. It is my great pleasure to meet and see you in this event.

Although, there are so many obstacles that should be faced in the pandemic situation, however, as young generation, we should be optimistic, stay strong and be active in searching and finding the solution. The FIRST 2021 and SNAPTEKMAS 2021 as the DIES of State Polytechnic of Sriwijaya annual event will become one of the media to support those activities. The researchers could share knowledge, find partners, and enlarge the collaboration through this event.

Based on the change in the model of the teaching learning activity that focuses on the MERDEKA BELAJAR, State Polytechnic of Sriwijaya has a big desire in getting acceleration in the internationalization of the institution. One of them by improving the overseas and industrial collaboration, especially in joint research and joint publication. In the beginning of 2021, the research and community service unit in Politeknik Negeri Sriwijaya has launched new schemes of research and community service, namely the Overseas Collaboration Research and Overseas Collaboration Community Service. Thanks to God, those schemes have attracted researchers not only from Asia but also several other countries outside Asia, such as: research and community service collaboration with Al Baha University from Saudi Arabia, with Ferdowsi University of Mashhad from Iran, and with Princess Sumaya University of Technology from Jordan, as well as several other foreign universities.

In this occasion, I also would like to welcome all the researchers that become the collaborators in our new scheme of research and community service. It is our great honour to have you as our collaborators.

The honourable participants,

At this time, State Polytechnic of Sriwijaya has held 5 times of FIRST. FIRST publications from previous conferences have been successfully indexed not only in SCOPUS, but also in WOS. This 5th FIRST seminar will be conjugated with the 3rd National Seminar on Community Service SNAPTEKMAS. (National seminar of applied technology for public). All of these are the efforts to improve the quality of Polsri lecturers which significantly have a positive effect on the learning process of Polsri students.

Before ending my speech, I would like to congratulate the participants of The FIRST 2021 and SNAPTEKMAS 2021. May the noble efforts, support, and cooperation of researchers in this conference will continue. Special thanks to the organizer and co-organizer committee of The FIRST 2021 and SNAPTEKMAS 2021 for the hard work and the commitment in realizing this conference. Do maintain the spirit of working in a team and continue to unite in order to display a culture of excellence in the eyes of the country and the world.

With Bismillahirrahmanirrahim, I officiate The FIRST 2021 and SNAPTEKMAS 2021.
Wassalamu'alaikum warrahmatullahi Wabarakatu

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KEYNOTE SPEAKER



Prof. Ramaraj Boopathy

Alcee Fortier Distinguished Service Professor of biological sciences
at the Nicholls State University, USA

Fulbright Scholar Fulbright Senior Specialist World Class Professor-Government of Indonesia. Honorary Visiting Professor, ITB, Indonesia Alcee Fortier Distinguished Service Professor John Brady Endowed Professor in Biological Sciences Nicholls State University Business Address: Alcee Fortier Distinguished Service Professor John Brady Endowed Professor in Biological Sciences Department of Biological Sciences Nicholls State University Thibodaux **EDUCATION:** B.Sc. Zoology, University of Madras, India; 1979 M.Sc. Environmental Biology, Tamil Nadu Agricultural University, India; 1981 Ph.D. Environmental Biology, University of Madras, India; 1986 **UNIVERSITY RESPONSIBILITIES:** Responsibilities include Teaching Environmental Biotechnology, a Senior and Graduate level course, Marine and Environmental Biology (Graduate Course), Microbiology and Environmental Biology courses. Research interests include Bioremediation of Hazardous Chemicals and Anaerobic Microbiology. Service includes advising students, participate in Departmental and University committees and serving the local and regional communities. Advisor to Masters Program in Marine and Environmental Biology. **PROFESSIONAL EXPERIENCE:** January 2013 – Present: John Brady Endowed Professor in Biological Sciences, Department of Biological Sciences, Nicholls State University, Thibodaux. Teaching, Research, and Service to the University and Community. August 2012 – Present: Alcee Fortier Distinguished Service Professor, Department of Biological Sciences, Nicholls State University, Thibodaux. Teaching, Research, and Service to the University and Community. August 2004 – Present: Distinguished Service Professor, Department of Biological Sciences, Nicholls State University, Thibodaux. Teaching, Research, and Service to the University and Community. **MAJOR AREAS OF RESEARCH INTERESTS:** Anaerobic digestion, Composting, Biodegradation of hazardous chemicals. Antibiotic resistant bacteria and Antibiotic resistance genes in the aquatic ecosystem. Isolation and identification of novel bacteria. Anaerobic degradation of explosive chemicals with particular reference to sulfate reducing bacteria. Design and development of biological reactor systems. Microbial immobilization of

heavy metals and radionuclides. Alcohol production from agricultural residues. Water quality in the wetlands. Alternative to sugarcane burning, Biological control of termites. Organic ways to control land loss and coastal restoration.

KEYNOTE SPEAKER



Dr. Ing. Ahmad Taqwa, MT.

Director of Politeknik Negeri Sriwijaya Indonesia


Director of State Polytechnic of Sriwijaya, other than that, he is still active at Head of The Research and Publication Commission Forum Director of State Polytechnical In Indonesia, Founder of The Online Journalist Board (IWO) Sumsel, Chairman of The Advisory Board of UKM Nusantara Palembang and Assessor of Higher Accreditation Board. **EDUCATION:** Diplom Ingenieur Electrical Engineering HTL, Ingenieurschule Beider Basel, Switzerland; 1994, Magister (2005) and Doctoral (2010) at Electrical Engineering, Bandung Institute of Technology, Indonesia. **RESEARCH:** Head of Research Assignment “Mini PLTS Periodic Cooling System to Overcome Overheating in Palembang City” (2019), Member of The Research Assignment “Effects of Sea Salt Dust Collection on Output Loss and Solar Panel Output Efficiency” (2020), and Head of Research Assignment “Design and Build of Wireless Sensor Network Prototype Detection Of Landslides Based on IOT and LORA” (2020). **DEDICATION:** “The Design and Evaluation of Virus Scan in The E-Mail System in SMA N 5 Palembang” (2018), Assignment Service “Utilization of WSN Technology in Parking Air Monitoring Foundation SMP Harapan Mulia Palembang” (2019), Development of Teaching Materials with Interactive Multimedia with Education Game for Harapan Mulia Junior High School Students” (2020). **AWARD:** Certificate In Participating In The 200 Hour Advanced Technical Teacher Training awarded by FONTYS and PEDC (1998), Satyalancana Karya Satya X Year 2011 And Satyalancana Karya Satya XX Year 2017 by The President of The Republic of Indonesia. **WORKSHOP:** Seminar and Focus Group Discussion Forum The Rector of Indonesia “Economic Stability In The Vuca Area”, Ujung Pandang (2020), Workshop on Using Integrated Resources Information System Applications For Lecturers of State Polytechnical Polytechnic, Palembang (2019) And Workshop of Learning Methodology of Polsri Lecturers and Outside Education Domicile (PDD) as a Source Person, Palembang (2019).

RUNDOWN
The 5th FIRST 2021 INTERNATIONAL CONFERENCE
(FORUM IN RESEARCH SCIENCE AND TECHNOLOGY)
SNAPTEKMAS (Seminar Nasional Aplikasi Teknologi pada Masyarakat) 2021
Palembang, South Sumatera, Indonesia
Thursday, October 21, 20201

		Thursday, October 21, 20201			
No.	Session	Person in Charge	Time Allotment (WIB)	Liaison Officer	
1.	Registration	Event Section Committee	07.00 – 08.00	Doeslohal Djumrianti, S.E.MIS., Ph.D	
2.	The Opening Ceremony				
3.	Do'a				
4.	Indonesian National Anthem				
5.	Chair Report Speech	Event Section Committee	08.00 – 09.00		
6.	Speech and Opening Remarks by Director of State Polytechnic of Srijijaya				
7.	Souvenirs Gift, Group Photos				
PLENARY SESSION					
No.	Keynote Speaker	Affiliation	Time Allotment (WIB)	Moderator	Liaison Officer
1.	Dra. Nana Yuliana, MA., Ph.D.	The Indonesian LBBP Ambassador for the Republic of Cuba, concurrently with the Commonwealth of the Bahamas, Jamaica, the Dominican Republic and Haiti	09.00 – 10.00	Tiur Simanjuntak M.Pd.	Doeslohal Djumrianti, S.E.MIS., Ph.D
2.	Prof. Ramaraj Boopathy	Alcee Fortier Distinguished Service Professor of biological sciences at the Nicholls State University, USA	10.00 – 11.00	Prof. Hasan Basri	Dr. Nyayu Latifah Husni, M.T.
3..	Dr. Ing. Ahmad Taqwa, MT.	Director of Politeknik Negeri Srijijaya, Indonesia	11.00 – 12.00	Jaksen M. Amin, M.Si.	Dr. Martha Aznury, S.Pd., M.Si.

PARALLEL SESSION

No.	Theme	Room	Time	Moderator	Articles
1.	TRACK 1 (Engineering and Science)	1	13.00 – 16.00	Dr. Eng Tresna Dewi, M.Eng./ Ika Sulianti, ST, MT	15
2.	TRACK 1 (Engineering and Science)	2	13.00 – 16.00	Dr. Martha Aznury, M.Si./ Indah Purnamasari, M.Eng.	14
3.	TRACK 1 (Engineering and Science)	3	13.00 – 16.00	Fatahul Arifin, M.Eng, Ph.d./ Dr. Indrayani, S.T., M.T.	13
4.	TRACK 2 (Computer Science, Computer Engineering, Information System, Informatics Management)	4	13.00 – 16.00	Rika Sadariawati, M.Si./ M.Miftakul Amin, S.Kom., M.Eng	13
5.	TRACK 2 (Computer Science, Computer Engineering, Information System, Informatics Management)	5	13.00 – 16.00	Dr. Nyayu Latifah H, MT./ Lindawati, S.T., M.TI	12
6.	TRACK 3 (Social Science)	6	13.00 – 16.00	Doeslohah Djumrianti, S.E.MIS., Ph.D/ Dr. Marieska Lupikawati	13
7.	TRACK 3 (Social Science)	7	13.00 – 16.00	Dr. Sari Lestari ZR/ Dr. Rita Martini	14
8.	SNAPTEKMAS 1	8	13.00 – 16.00	Yumi Oklarina, ST, MT/ Mouland Irwadi, SE. M.Si.	15
9.	SNAPTEKMAS 2	9	13.00 – 16.00	Leni Novianti, M.Kom./ Maivi Kusnandar, M.Kom	15
10	SNAPTEKMAS 3	10	13.00 – 16.00	M Husni Mubarak, M.Si./ Martinus Mujur, ST, MT	15
11	SNAPTEKMAS 4	10	13.00 – 16.00	Dr. Ade Silvia H, MT./ M. Sopian Soim, ST, MT	13



CLOSING SESSION

Event	Time	Room
<ul style="list-style-type: none">- Closing Ceremony- Announcement of:<ol style="list-style-type: none">1. Best Paper FIRST IC 20212. Best Paper SNAPTEKMAS 20213. Best Presenter FIRST IC 20214. Best Presenter SNAPTEKMAS 2021- Quiz Online	16.00– 17.00	Main Room

TRACK 3 (Social Science)

ROOM : 6
 TIME : Thursday, 21 October, 2021/ 13.00 - 16.30
 ARTICLES : 13
 MODERATOR : Doeslohal Djumrianti, S.E.MIS., Ph.D/ Dr. Marieska
 Lupikawati

NO	Time	ID	AUTHORS	TITLE	AFFILIATION
1	13.00-13.10	3847	Ayu Chotibah, Bainil Yulina, Desi Apriyanty, Evada Dewata, Pridson Mandiangan	THE INNOVATION OF SOUTH SUMATERA TRADITIONAL BATIK E-COMMERCE APPLICATIONS	State Polytechnic of Sriwijaya
2	13.10-13.20	3683	M. Thoyib, Riza Wahyudi, Firmansyah, Darul Amri	THE ANALYSIS OF COST QUALITY ON PRODUCTIVITY OF IRON RAILING PRODUCTS IN SMALL AND MEDIUM BUSINESS IN PALEMBANG	State Polytechnic of Sriwijaya
3	13.20-13.30	3757/3756	Nelly Masnila, Firmansyah, Jovan Febriantoko, Riana Mayasari, Jamaliah Said	Quality of Financial Reporting and Impact of GGG Implementation: Study on Local Government in Indonesia	State Polytechnic of Sriwijaya
4	13.30-13.40	3796	Evi Agustina Sari, Sri Gustiani, Yusri, Tiur Simanjuntak	An Error Analysis of English Sentence Construction in Writing Subject Made by the Students of the English Department at Sriwijaya State Polytechnics	State Polytechnic of Sriwijaya
5	13.40-13.50	3827	Edwin Frymaruwah, Farah Aida Ahmad Nadzri, Periansya, Evada Dewata	DISCLOSURE OF SUSTAINABLE PERFORMANCE IN HIGHER EDUCATION IN INDONESIA	State Polytechnic of Sriwijaya, UiTM
6	13.50-14.00	3976	Hendra Hadiwijaya Febrianty Rezania Agramanisti Azdy	Improvement of LPKA Class 1 Palembang Electronic Dashboard with Field Performance Monitoring	Palcomtech Polytechnic, STMIK PalComTech
7	14.00-14.10	3853/4034	Neneng Miskiyah, Purwati, Yulia Pebrianti, Keti Purnamasari, Nyimas Miftahul Jannah,	OPTIMIZATION OF INCOME PARAMETERS OF SONGKET CRAFTSMEN ON KOPERASI SONGKET PALEMBANG	State Polytechnic of Sriwijaya

Table of Contents

FOREWORD FROM GENERAL CHAIR 5 th FIRST 2021	2
INTERNATIONAL CONFERENCE	2
FOREWORD FROM DIRECTOR OF STATE POLYTECHNIC OF SRIWIJAYA	4
ORGANIZING COMMITTEE	5
KEYNOTE SPEAKER	7
Dra. Nana Yuliana, MA., Ph.D.	7
KEYNOTE SPEAKER	8
Prof. Ramaraj Boopathy	8
KEYNOTE SPEAKER	10
Dr. Ing. Ahmad Taqwa, MT.	10
RUNDOWN.....	11
The 5 th FIRST 2021 INTERNATIONAL CONFERENCE.....	11
(FORUM IN RESEARCH SCIENCE AND TECHNOLOGY).....	11
SNAPTEKMAS (Seminar Nasional Aplikasi Teknologi pada Masyarakat) 2021	11
TRACK 1	14
(Engineering and Science)	14
TRACK 1	17
(Engineering and Science)	17
TRACK 1	20
(Engineering and Science)	20
TRACK 2	23
(Computer Science, Computer Engineering, Information System,.....	23
Informatics Management)	23
TRACK 2	25
(Computer Science, Computer Engineering, Information System,.....	25
Informatics Management)	25
TRACK 3 (Social Science).....	27
TRACK 3 (Social Science).....	29
MODELING OF INFILTRATION WELLS TO REDUCE RAINWATER RUNOFF OF BUILDINGS.....	53
ID: 3772.....	53
Radius Pranoto ^{1*} , Anggi Nidya S ¹ , Ricky RA ¹ , Djaka Suhirkam ¹ , Viktor Suryan ²	53

¹ Civil Department, Polytechnic State of Sriwijaya, Palembang 30139, Indonesia.....	53
² Civil Department, Palembang Aviation Polytechnic, Palembang 30139, Indonesia.....	53
FLEXURAL STRENGTH OF SELF-COMPACTING CONCRETE BEAMS.....	54
ID: 3860.....	54
Amiruddin ¹ , Ibrahim ¹ , Ika Sulianti ¹ , Agus Subrianto ^{1,*} , Muhamad Ramadhan ¹	54
¹ Polytechnic State of Sriwijaya,	54
THE EFFECT OF SHELL AS A SUBSTITUTION OF COARD AGGREGATE WITH SUPERPLASTICIZER ADDITIONAL ON THE COMPRESSION STRENGTH OF CONCRETE.....	55
ID: 4026.....	55
Lina Flaviana Tilik ^{1,*} Bambang Hidayat Fuady ² , Suhadi ³ , Rosy Armaini ⁴ , Fadhila Firdausa ⁵ , Muhammad Rifqi Agusri ⁶ , Puji Hartoyo ⁷	55
^{1,2,3,4,5,6,7} State Polytechnic of Sriwijaya.....	55
DESIGN OF GEOMETRIC AND RIGID PAVEMENT THICKNESS ON JALAN LINGKAR BARAT SP. SPORTS CENTER - BUKIT SULAP STA 0+100 - STA 7+583 LUBUKLINGGAU CITY, SOUTH SUMATERA PROVINCE.....	56
ID: 3935.....	56
Kosim ¹ , Julian Fikri ^{1*} , siswa Indra ¹ , Kiki Rizky Amalia ¹ , Intan Puspita Sari ² , Yudha Prasetya ²	56
¹ Lecturer of Civil Engineering State Polytechnis Of Sriwijaya.....	56
² Student of Prodi D-1V Road and Bridge Civil Engineering	56
UTILIZATION OF BOTTOM ASH AND SAWDUST WASTE AS A PARTIAL REPLACEMENT FOR FINE AGGREGATE IN THE MANUFACTURE OF CONCRETE.....	57
ID: 3907.....	57
Kosim, Zainuddin ¹ , Raja Marpaung ¹ , Darma Prabudi ¹	57
¹ Department of Civil Engineering Polytechnic State of Sriwijaya.....	57
STUDY ON THE APPLICATION OF BICYCLE SPECIAL ROUTES AS AN ENVIRONMENTAL TRANSPORTATION IN THE CITY AREA OF PALEMBANG USING THE BLOS METHOD	58
ID: 3682.....	58
Efrilia Rahmadona ^{1,*} Norca Praditya ² M. Ade Surya Pratama ³ Sudarmadji ⁴ , Muhammad Iqbal ⁵ ,Arief Perdana Kesuma ⁶ , Rica Solenne ⁷	58
^{1,2,3,4,5,6,7} State Polytechnic of Srwiwijaya	58
UTILIZATION OF REMOTE SENSING TECHNOLOGY FOR FLOOD DISTRIBUTION IN PALEMBANG CITY WEB-BASED	59
ID: 3854.....	59
Indrayani ^{1,*} Andi Herius ¹ , Akhmad Mirza ¹ , Arfan Hasan ¹	59

1 Civil Engineering Department, Politeknik Negeri Sriwijaya, Palembang Indonesia.....	59
UTILIZATION OF THE KELEKAR RIVER FLOW AS MICRO-HYDRO POWER PLANT	60
ID: 3992.....	60
Indrayani ^{1,2*} Aida Syarif ^{2,3} , Syahirman Yusi ^{2,4} , M. Noviansyah Nugraha ² , Renny Citra Ramadhani ²	60
¹ Civil Engineering Department, Politeknik Negeri Sriwijaya, Palembang Indonesia;.....	60
² Renewable Energy Engineering Study Program, Politeknik Negeri Sriwijaya, Palembang Indonesia;.....	60
³ Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang Indonesia;	60
⁴ Commercial Administration Department, Politeknik Negeri Sriwijaya, Palembang Indonesia	60
IMAGE PROCESSING APPLICATION ON AUTOMATIC FRUIT DETECTION FOR AGRICULTURE INDUSTRY	61
ID: 3804.....	61
Tresna Dewi ^{1,*} Rusdianasari ² RD Kusumanto ³ Siproni ⁴	61
¹ Electrical Engineering Department, Politeknik Negeri Sriwijaya	61
² Renewable Energy Department, Politeknik Negeri Sriwijaya	61
³ Electrical Engineering Department, Politeknik Negeri Sriwijaya	61
⁴ Mechanical Engineering Department, Politeknik Negeri Sriwijaya	61
THE CONCEPT AND DESIGN OF SOLAR POWERED SPRINKLER SYSTEM BASED ON IOT MONITORING	62
ID: 3880.....	62
Tresna Dewi ^{1,*} Rusdianasari ² Ahmad Taqwa ³ Teddy Wijaya ⁴	62
¹ Electrical Engineering Department, Politeknik Negeri Sriwijaya	62
² Renewable Energy Department, Politeknik Negeri Sriwijaya	62
³ Renewable Energy Department, Politeknik Negeri Sriwijaya	62
⁴ Electrical Engineering Department, Politeknik Negeri Sriwijaya	62
RAPID TRANSIT (BRT) PUBLIC TRANSPORT SERVICE CORRIDOR I: ALANG LEBAR TO DEMPO DURING THE COVID 19 PANDEMIC IN THE CITY OF PALEMBANG	63
ID: 3837.....	63
Herlinawati ¹ , Yusri Bermawi ^{1,*} , Moch. Absor ¹ , A.Latif ¹ , Muhammad Dimas ¹ , Muhammad Arief M ¹ , Muhammad Geraeldy ¹ , Ibnusyah Alam ¹	63
¹ Civil Engineering, Politeknik Negeri Sriwijaya, Palembang, 30154, Indonesia	63
The Effect of Quenching Media on the Hardness of AISI 1045 Steel.....	64
ID: 4074.....	64
Mulyadi ¹⁾ , Dodi Tafrant ^{1,*)} , Hendradinata ¹⁾ , Zainuddin ¹⁾	64
¹ Mechanical Engineering, State Polytechnic of Sriwijaya.....	64

Improvement of Original Soil with Addition of Variation of Embankment Based on CBR (California Bearing Ratio) Value	65
ID 4107.....	65
Ibrahim ¹ , Andi Herius ¹ , Nadra Mutiara Sari ¹ , M Aidil Iskandarsyah ² , M Okta Fathur Rahman ²	65
¹ Lecturer of Civil Engineering Sriwijaya State Polytechnic.....	65
² Student of D-III Civil Engineering Study Program Sriwijaya State Polytechnic.....	65
Narrative Review of Subchondral Bone Morphology on Cartilage Damage (Osteoarthritis)	66
ID: 4122.....	66
Nanda Yusril Mahendra ¹ , Dicky Pratama Putra ¹ , Imam Akbar ¹ , Risky Utama Putra ¹ , Akbar Teguh Prakoso ¹ , Muhammad Yanis ¹ , Hendri Chandra ¹ , Ardiyansyah Syahrom ^{2,3} , Hasan Basri ^{1*}	66
¹ Department of Mechanical Engineering, Faculty of Engineering, Universitas Sriwijaya, Indralaya, Ogan Ilir, Indonesia.....	66
² Applied Mechanics and Design, School of Mechanical Engineering, Faculty of Engineering, Universiti Teknologi Malaysia 81310 UTM Johor Bahru, Malaysia.....	66
³ Medical Devices and Technology Centre (MEDiTEC), Institute of Human Centred and Engineering (iHumEn), Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Malaysia	66
Numerical Investigation of the Mechanical Properties of 3D Printed PLA Scaffold	67
ID: 4124.....	67
Zainal Abidin ¹ , Irfan Ghani Fadhlurrahman ¹ , Imam Akbar ¹ , Risky Utama Putra ¹ , Akbar Teguh Prakoso ¹ , M. Zahri Kadir ¹ , Astuti ¹ , Ardiyansyah Syahrom ^{2,3} , Hasan Basri ^{1*}	67
¹ Department of Mechanical Engineering, Faculty of Engineering, Universitas Sriwijaya, Indralaya, Ogan Ilir, Indonesia.....	67
² Applied Mechanics and Design, School of Mechanical Engineering, Faculty of Engineering, Universiti Teknologi Malaysia 81310 UTM Johor Bahru, Malaysia.....	67
³ Medical Devices and Technology Centre (MEDiTEC), Institute of Human Centred and Engineering (iHumEn), Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Malaysia	67
MODELING OF THREE PHASE INDUCTION MOTORS IN CONTROL SYSTEM LABORATORY AT THE ELECTRICAL DEPARTMENT OF STATE POLYTECHNIC OF SRIWIJAYA	68
ID: 4135.....	68
Masayu Anisah ^{1,*} , Destra Andika Pratama, Niksen Alfari ³ , Lindawati ⁴ , Anton Firmansyah ⁵ , Mery Aldah Regiani ⁶ , Sinta Nabila ⁷ , Safaa Najah Saud ⁸	68
^{1,2,3,4,5,6,7} Politeknik Negeri Sriwijaya, Jl. Sriwijaya Negara - Kota Palembang, 30139.....	68
⁸ Management and Science University, University Drive, Off Persiaran Olahraga, 40100 Shah Alam, Selangor, Malaysia	68
DEGRADATION OF METHYLENE BLUE DYE USING ZnO/NiFe ₂ O ₄ PHOTOCATALYST UNDER VISIBLE LIGHT ...	69

ID: 3967.....	69
Yuniar ^{1*} , Tri Mawarni ² , Poedji Loekitowati Hariani ³ , Muhammad Faizal ⁴ , Tuty Emilia Agustina ⁵	69
^{1,4,5} Chemical Engineering Department, Sriwijaya University, Palembang, Indonesia	69
³ Chemistry Department, Sriwijaya University, Palembang, Indonesia.....	69
² Chemical Engineering Department, State Polytechnic Sriwijaya, Palembang, Indonesia.....	69
SYNGAS ANALYSIS OF LOWRANK COAL GASIFICATION DOWNDRAFT PRODUCTS WITH VARIATIONS IN AIR FLOW RATE.....	70
ID: 3985.....	70
Aida Syarif ¹⁾ , Neli Masnila ²⁾ , Indrayani ³⁾ , M. Yerizam ⁴⁾ , Apriansyah Zulatama ⁵⁾ , Sarmidi ⁶⁾	70
¹⁾ Program Studi Magister Terapan Teknik Energi Terbarukan, Politeknik Negeri Sriwijaya.....	70
²⁾ Program Studi Sarjana Terapan Akutansi Bisnis, Politeknik Negeri Sriwijaya.....	70
³⁾ Program Studi Magister Terapan Teknik energy Terbarukan, Politeknik Negeri Sriwijaya.....	70
⁴⁾ Program Studi Magister Terapan Teknik energy Terbarukan, Politeknik Negeri Sriwijaya.....	70
PRACTICAL LEARNING BASED ON VIRTUAL REALITY METHODS AS A SOLUTION TO INCREASE EVALUATION LEVEL 1 RESULTS IN PRACTICAL LEARNING AT PT PLN (PERSERO) UPDL PALEMBANG.....	71
ID: 3764.....	71
Fajrie Agus Dwino Putra ^{1*} , Supli Efendi Rahim ² , Zulhipni Reno Saputra ³	71
¹ Instructor, PT PLN (Persero) UPDL Palembang, Palembang, Indonesia	71
² Lecturer, Kader Bangsa University, Palembang, Indonesia.....	71
³ Lecturer, Muhammadiyah University, Palembang, Indonesia	71
WITH THE TRAY DYER DRYING METHOD FOR MAKING HERBAL TEA FROM A MIXED FLOWER POLE (Clitoria ternatea) WITH GINGER POWDER (Zingiber officinale) ACCORDING TO INDONESIAN NATIONAL STANDARDS (SNI)	72
ID: 3931.....	72
Sofiah ^{1*} ,A.Rizal Aswan ¹ , Isnandar Yulianto ¹ , Cindi Ramayanti ¹ , Aliyah Nahda Utami ¹	72
¹ Department of Chemical Engineering, Politeknik Negeri Sriwijaya	72
PROTOTYPE OF KEMPELANG FISH DRYERS REVIEWED FROM ENERGY OF H₂O THAT IS EVAPORATED TO AIR	73
ID: 3782.....	73
Ida Febriana ^{1*} , KA Ridwan ¹ , Aneasari M ¹ , Taufik Jauhari ¹	73
¹ Chemical Engineering Department, State Polytechnic of Sriwijaya, Indonesia	73
ANALYSIS OF SYNGAS RESULTS OF THE MAINDEPTH COAL GASIFICATION PROCESS WITH GASIFICATION DOWNDRAFT METHODS.....	74

ID: 4054.....	74
Erlinawati ¹ , Aida Syarif ² , Arizal Azwan ³ , Tahdid ⁴ ,	74
^{1,2,3,4} Energy Engineering Applied Undergraduate , Sriwijaya State Polytechnic.....	74
DESIGN AND PERFORMANCE OF SMALL-SCALE DOWNDRAFT BIOMASS GASIFICATION: A CASE STUDY OF	75
RICE HUSKS	
ID: 3999.....	75
Ozkar F. Homzah ^{1*} , Rachmat D Sampurno, A Junaidi ¹ , Dodi Tafrant ¹	75
¹ Department of Mechanical Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia.....	75
.....	76
THE POTENTIAL OF CHAR COAL GASIFICATION AS AN ECO-FRIENDLY FUEL	
ID: 4016.....	76
Aria Yopianita ^{1*} , Aida Syarif ² , Muhammad Yerizam ²	76
¹ Master of Applied Renewable Energy Engineering, Sriwijaya State Polytechnic.....	76
² Chemical Engineering, Sriwijaya State Polytechnic	76
EFFECT OF SULFURIC ACID AND FERMENTATION TIME ON BIOETHANOL PRODUCTION FROM EMPTY FRUIT	77
BUNCH (EFB)	
ID: 3900.....	77
*Martha Aznury ¹ Ahmad Zikri ¹ Aisyah Suci Ningsih ¹ Siti Chodijah ¹ Felisia Hanura ¹ Muhammad Albarr Aksa ¹ Nova Rachmadona ²	77
¹ Department of Chemical Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia.....	77
² Department of Chemical Science and Engineering, Graduate School of Engineering, Kobe University, Japan...	77
UTILIZATION OF PALM KERNEL OIL (PKO) AS VEGETABLE OIL IN MAKING MAYONNAISE WITH THE ADDITION	78
OF VIRGIN COCONUT OIL (VCO) AND PALM COOKING OIL (PCO)	
ID: 4041.....	78
*Martha Aznury ¹ Ahmad Zikri ¹ Aisyah Suci Ningsih ¹ Siti Chodijah ¹ M.Arif Abdul Ghoni ¹ Rizka Yuni Zhafira ¹ Nova Rachmadona ²	78
¹ Department of Chemical Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia.....	78
² Department of Chemical Science and Engineering, Graduate School of Engineering, Kobe University, Japan...	78

PRODUCTION OF SOLID SOAP WITH ADDITION OF GREEN BETAL LEAVE (Piper betle L.) EXTRACT AND LEFT LEMON EXTRACT(Cymbopogon nardus L. Rendle) AS ANTIOXIDANTS	79
ID: 4042	79
*Martha Aznury ¹ Ahmad Zikri ¹ Aisyah Suci Ningsih ¹ Elina Margaretty ¹ Liona Agriani ¹ Indriani ¹ Nova Rachmadona ²	79
¹ Department of Chemical Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia	79
² Department of Chemical Science and Engineering, Graduate School of Engineering, Kobe University, Japan	79
PURIFICATION OF RAW MATERIAL AND BIODIESEL PRODUCTS FROM WASTE OIL WITH DEEP EUTETIC SOLVENT (DES)	80
ID: 4043	80
Sahrul Effensi ¹⁾ ,Aida syarif ²⁾ , Irawan ³⁾	80
1,2,3Chemical Engineering Department, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara, Bukit Besar, Ilir Barat I, Palembang 30139, South Sumatera, Indonesi	80
FIELD EXPERIMENTAL STUDY ON ELECTRICAL POWER GENERATION USING AC SINGLE-PHASE PERMANENT MAGNET GENERATOR	81
ID 4118	81
I Made Wiwit Kastawan ^{1*} , Erwin Yusuf ² , Rusmana ³ , Krisna ⁴	81
SIMULATION ON EFFECTS OF USING CAPACITOR FOR REACTIVE POWER (VAR) COMPENSATION ON ELECTRICAL POWER SUPPLY QUALITY	82
ID 4119	82
Siti Saodah ¹ , I Made Wiwit Kastawan ^{2*} , Erwin Yusuf ³ , Bambang Puguh Manunggal ^{4.} , Maryanti ⁵	82
Biodiesel from Pyrolysis Fatty Acid Methyl Ester (FAME) using Fly Ash as a Catalyst	83
ID: 4066	83
Yohandri Bow ^{1.*} Abu Hasan ² , Rusdianasari ² , Zakaria ³ , Bambang Irawan ² , Nedia Sandika ²	83
¹ Energy Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia	83
² Renewable Energy Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia	83
³ English Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia	83
MODELING OF VARIABLE SPEED DRIVE IN THE CONTROL SYSTEM LABORATORY AT THE ELECTRICAL DEPARTMENT OF STATE POLYTECHNIC OF SRIWIJAYA	84
ID: 4151	84
Siswandi, ^{1,*} Anton Firmansyah ² , Destra Andika Pratama ³ , Yessi Marniat ⁴ , Ichwaldi Amzah ⁵ , Muhammad Irfan Pratama ⁶ , Ichwaldi Amzah ⁷ , Muhammad Irfan Pratama ⁸	84

1,2,3,4,5,6 Politeknik Negeri Sriwijaya, Jl. Srijaya Negara - Kota Palembang, 30139.....	84
7,8 Politeknik Mukah Sarawak, KM 7.5, Jalan Oya 96400 Mukah Sarawak, Malaysia	84
IDENTIFICATION OF ROAD CONDITION SURVEY RESULTS ON THE MAKING OF MAP OF PALEMBANG CITY	85
ROAD NETWORK BASED ON GIS	
ID: 3806.....	85
Norca Praditya ¹ , Indrayani ^{1,*} , Andi Herius ¹ , Kosim ¹ , Tata Peryoga ² , Mendro Anggoro ²	85
¹ Civil Engineering Department, Politeknik Negeri Sriwijaya, Palembang Indonesia	85
² IDN Western Australia, Perth	85
MODELLING DESIGN DIFFUSER HORIZONTAL AXIS WIND TURBINE	86
ID: 3889.....	86
Fatahul Arifin ^{1,*} , RD Kusumanto ³ , Yohandri Bow ² , Ahmad Zamheri ³ , Rusdianasari ² , Min Wen Wang ⁴ , Afries Susandi ² , Yusuf Dewantoro Herlambang ⁵ ¹ Department of Mechanical Engineering, Politeknik Negeri Sriwijaya, Jalan Srijaya Negara, Palembang, Indonesia	86
² Department of Electrical Politeknik Negeri Sriwijaya, Jalan Srijaya Negara, Palembang, Indonesia	86
³ Department of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Jalan Srijaya Negara, Palembang, Indonesia	86
⁴ Department of Mechanical Engineering, National Kaohsiung University Science and Technology, No. 415, Jiangong Rd, Kaohsiung, Taiwan	86
⁵ Department of Mechanical Engineering, Politeknik Negeri Semarang, Jl. Prof. Sudarto, Semarang, Indonesia ...	86
DESIGN WIND TURBINE FOR EXHAUST WIND AREA COAL MINING	87
ID: 3947.....	87
RD Kusumanto ¹ , Fatahul Arifin ^{2,*} , Carlos R.S ¹ , Ahmad Zamheri ² , Rusdianasari ³ , Min Wen Wang ⁴ , RM Fauzi ³ , Yusuf Dewantoro Herlambang ⁵	87
¹ Department of Electrical Politeknik Negeri Sriwijaya, Jalan Srijaya Negara, Palembang, Indonesia	87
² Department of Mechanical Engineering, Politeknik Negeri Sriwijaya, Jalan Srijaya Negara, Palembang, Indonesia	87
³ Department of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Jalan Srijaya Negara, Palembang, Indonesia	87
⁴ Department of Mechanical Engineering, National Kaohsiung University Science and Technology, No. 415, Jiangong Rd, Kaohsiung, Taiwan	87
⁵ Department of Mechanical Engineering, Politeknik Negeri Semarang, Jl. Prof. Sudarto, Semarang, Indonesia ...	87
The Production of Biogas and Electrical Energy from Market Waste at Fixed Dome Bio-digester in Talang Banjar Jambi	88

ID: 4062.....	88
Leila Kalsum ^{1,*} Yordan Hasan ² , Rusdianasari ¹ , Aida Syarif ¹ , Dayaningrat ¹ , Syaiful M ¹	88
¹ Renewable Energy Study Program, Sriwijaya State Polytechnic, Palembang Indonesia	88
² Electronic Engineering Sriwijaya State Polytechnic, Palembang Indonesia.....	88
Comparison Progressive Web Application in Learning Management System (LMS)	89
ID: 4087.....	89
Dian Nugraha ^{1,*} Febria Anjara ² , Safira Faizah ³	89
^{1,3} Faculty Engineering & Computer Science, Jakarta Global University, West Java-Indonesia	89
² Faculty Economy & Business, Jakarta Global University, West Java-Indonesia	89
The Effectiveness of Solar panels From The Installation Location Changes In Angle and Light	90
ID: 4047.....	90
Yessi Marniati ^{1,*} , Nofiansah ¹ , Herman Yani ¹ , Siswandi ¹	90
¹ Electrical Engineering Departement, Politeknik Negeri Sriwijaya, Palembang Indonesia.....	90
THE NUMBER OF VISITORS OF THE TELECOMMUNICATION ENGINEERING LABORATORY THE PANDEMIC TIME CORONA VIRUS DISEASE LIMITDURING2019 (COVID-19) BASED ON THE INTERNET OF THINGS	91
ID: 4049.....	91
M. Zakuan Agung ^{1,*}), Suzan zefi ²), R.A Halimatussa'diyah ³), Rapiko Duri ⁴), Dea Rahma Dona ⁵), Fitri Rahma Daliza ⁶)	91
¹⁻⁶ Department of Polytechnic Sriwijaya, Jalan Srijaya Negera, Bukit Besar, Palembang - Indonesia.....	91
Energy Management on Electric Vehicles Using Fast Charging Banking Capacitor using Internet of Things (IoT) System	92
ID: 4051.....	92
Selamat Muslimin ^{1,*} Renny Maulidda ¹ Evelina ¹ M. Nawawi ¹ Iskandar Lutfi ¹ Johansyah Al Rasyid ¹ M. Fadli ¹ Puput Anggraini ¹ M. Yusuf ¹ Wanda Merian PA ¹	92
¹ Politeknik Negeri Sriwijaya.....	92
Implementation of Solar Cells as an Alternative Energy Source for Automatic Water Tank Filling in Hydroponic System	93
ID: 4064.....	93
Yudi Wijanarko ¹ Renny Maulidda ^{1,*} Masayu Anisah ¹ Evelina ¹ Sara Yulida ¹ Tarisa Ramadhani ¹ Phillips Dharmaraj ² Metrina Jasman ³	93
¹ Politeknik Negeri Sriwijaya, Palembang, Indonesia	93
² Politeknik Kota Kinabalu, Malaysia	93
³ SMK Negeri 1 Indralaya Selatan, Indonesia	93

	94
IMPLEMENTATION OF SMART GRID SYSTEM FOR ALTERNATIVE ENERGY POWER PLANTS SOURCES	
ID: 3786.....	94
Masayu Anisah ¹ Yudi Wijanarko ¹ Renny Maulidda ^{1,*} Johansyah Al Rasyid ¹ Dimas Prasetya WP ¹ M. Dandy Ramadhan ¹ Mohammad Noviansah ¹	94
¹ State Polytechnic of Srwijiaya.....	94
IMPLEMENTATION OF SMART GRID SYSTEM ON ALTERNATIVE ENERGY OF FLOATING HOUSES AT MUSI RIVER BANK ESTUARY OF THE OGAN RIVER	95
ID: 3790.....	95
Yudi Wijanarko ¹ , Adi Syakdani ¹ , Ekawati Prihatini ¹ , Sairul Effendi ¹ , Aulia Rizki Utami ¹ , Trigitha Melintika ¹ , Ryo Pakusadewo ¹	95
¹ Electrical Engineering Department, Politeknik Negeri Sriwijaya	95
The Effect of Carbonization Temperature and Concentration of KOH Activator on the Quality of Eucalyptus Pellita	96
Activated Carbon in Fe Absorption	
ID: 4063.....	96
Leila Kalsum ^{1*)} , Idha Silviyati. ¹⁾ , Jenie Fahlevi Putri ¹⁾	96
¹ Department of Chemical Engineering Study Program, Sriwijaya State Polytechnic, Bukit Besar, Palembang 30139, Indonesia.....	96
SOLAR PANEL AS ALTERNATIVE ENERGY SOURCE FOR WATER PUMP CONTROL SYSTEM AT THE FLOATING HOUSE IN THE PALEMBANG MUSI RIVER BANK	97
ID: 4101.....	97
Ekawati Prihatini ¹ , Yudi Wijanarko ² , Yeni Irdyanti ³ , Herman Yani ⁴ , Muhammad Aldo Pratama ⁵ , Suryani ⁶ , Charles Sumion ⁷	97
¹⁻⁶ Electrical Engineering Department, Polytechnic State of Sriwijaya, Jalan Srijaya Negara Bukit Besar Palembang City, South Sumatera, 30139, Indonesia	97
⁷ Politeknik Kota Kinabalu, Jalan Politeknik No. 4 KKIP Barat, 88460 Kota Kinabalu Industrial Park, Sabah, Malaysia	97
	98
Comparison of Batteries Used in Electrical Vehicles (A Review)	
ID: 4103.....	98
Selamat Muslimin ^{1,*} Zainuddin Nawawi ² , Bhakti Yudho Suprpto ³ , Tresna Dewi ⁴	98

1,2,3,4 Electrical of Engineering, University of Sriwijaya.....	98
Hardware Design and Simulation of Lung Sound Detector to Analyze Lung Abnormalities Based On Arduino Mega, NodeMCU ESP32, and Internet of Things ID: 4125.....	99
Amperawan ¹ , Destra Andika ² , Dewi Permatasari ³ , Sabilal Rasyad ⁴ , Zainudin b Mat Taib ⁵ , Nuwairani Azurawati bt Siha ⁶ , Aldi Wijaya ⁷ , Muhammad Taufiqurrahman Arrasyid ⁸	99
¹⁻⁶ Department of Electronic Engineering, Politeknik Negeri Sriwijaya, JL.Srijaya Negara Bukit Besar, Palembang, 30139, Indonesia.....	99
, Politeknik Negeri Sriwijaya, JL.Srijaya Negara Bukit Besar, Palembang , 30139, Indonesia.....	99
⁷⁻⁸ Department of Electrical Engineering, Politeknik Mukah Serawak, JL. Oya-Mukah KM 7, Mukah Serawak, 9640, Malaysia.....	99
.....	100
Design of Touch Key-Voice Command Based Vehicle Additional Security System ID: 3791.....	100
Muhammad Firdaus Jauhari ^{1,*} , Rusmini Sri Maryati ¹ , Raihan ¹	100
¹ Automotive Mechanical Engineering, Politeknik Negeri Banjarmasin, Banjarmasin, Indonesia,	100
.....	101
AUTOMATION OF THE PALEMBANG SEMAGE FABRIC YARN SPINNER ID: 3694.....	101
Eka Susanti ¹⁾ , Ica Admirani ²⁾ , Romi Wilza ³⁾ , Irawan Hadi ⁴⁾ , Sholihin ⁵⁾	101
¹⁻⁵ State Polytechnic of Sriwijaya, Jalan Srijaya Negera, Bukit Besar, Palembang - Indonesia.....	101
.....	102
WebRTC Signaling Using nprtc For OnlineVirtual Classroom ID: 4088.....	102
Raswa ^{1,*} Sumarudin ^{2,*} Eka Siswantohadi ^{3*}	102
¹ Politeknik Negeri Indramayu	102
² Politeknik Negeri Indramayu	102
³ Politeknik Negeri Indramayu	102
.....	103
IoT-Based Technological Innovation in Improving the Productivity of Macan Kumbang Fish Cultivator ID: 3730.....	103
Nelly Masnila ¹ , Hendradinata ² , Indra Griha Tofik Isa ^{3,*} , Riana Mayasari ⁴	103

1,4 Accounting Department, Politeknik Negeri Sriwijaya	103
2 Mechanical Engineering Department, Politeknik Negeri Sriwijaya	103
3 Informatics Management Department, Politeknik Negeri Sriwijaya	103
.....	104
TPACK FRAMEWORK BASED INTERACTIVE DIGITAL LEARNING	
ID: 3777	104
Hetty Meileni ^{1,*} , Indra Satriadi ² , Sony Oktapriandi ³ , Desi Apriyanty ⁴	104
¹⁻⁴ State Polytechnic Of Sriwijaya	104
DEVELOPMENT OF MULTI PLATFORM GEOGRAPHIC INFORMATION SYSTEM ASSESSMENT OF PROSPECTIVE	
.....	105
BIDIKMISI STUDENTS USING REUSE DRIVEN SOFTWARE DEVELOPMENT PROCESS METHOD	
ID: 3788	105
M Aris Ganiardi ¹ , Nita Novita ² , Indri Ariyanti ³ , Delta Khairunnisa ⁴	105
¹⁻⁴ Informatics Management Department, Politeknik Negeri Sriwijaya, Srijaya Negara Street, Palembang, 30139, Indonesia	105
.....	106
DEVELOPMENT OF 3D MULTIMEDIA AS A LEARNING TOOLS ONLINE BASED VIRTUAL REALITY	
ID: 3797	106
Sholihin ¹⁾ , Emilia Hesti ²⁾ , Sarjana ³⁾ , Adewasti ⁴⁾	106
¹⁻⁴ Department of Polytechnic Sriwijaya, Jalan Srijaya Negera, Bukit Besar, Palembang - Indonesia	106
.....	107
Design of Air Quality Monitoring System Using LoRa Communication Technology	
ID: 3799	107
Mohammad Fadhli ^{1,*} , Asriyadi ¹ , Lindawati ¹ , Irma Salamah ¹	107
¹ Politeknik Negeri Sriwijaya	107
.....	108
INNOVATION TECHNOLOGY OF LEKOR DOUGH MIXER BASED INTERNET OF THING	
ID: 3861	108
Suzan Zefi ¹ , Eka Susanti ² , M. Zakuan Agung ³ , R.A Halimatussa'diyah ⁴	108
¹ Department of Polytechnic Sriwijaya, Jalan Srijaya Negera, Bukit Besar, Palembang - Indonesia	108
DEVELOPMENT OF 3D MULTIMEDIA AS A PRACTICAL SUGGESTION FOR VIRTUAL REALITY-BASED DIGITAL	
.....	109
ENGINEERING	

ID: 3857.....	109
Martinus Mujur Rose ¹⁾ , Sholihin ²⁾ , Sarjana ³⁾ , Ir. H. Abdul Rakhman ⁴⁾ , Ir. Ali Nurdin ⁵⁾	109
¹⁻⁵ Department of Polytechnic Sriwijaya, Jalan Srijaya Negera, Bukit Besar, Palembang - Indonesia	109
.....	110
Single Page Application for Business Intelligence Dashboard	
ID: 3521.....	110
M. Miftakul Amin * ¹ , Adi Sutrisman ² , Yevi Dwitayanti ³	110
^{1,2} Department of Computer Engineering, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Bukit Besar, Palembang, 30139, Indonesia	110
³ Department of Computer Accounting, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Bukit Besar, Palembang, 30139, Indonesia	110
.....	111
Evaluating Users' Emotion in Web-Based Geographic Information System	
ID: 4025.....	111
Leni Novianti ¹ , Indra Griha Tofik Isa ^{2,*} , Indri Ariyanti ³ , Rika Sadariawati ⁴ , Anitawati Mohd Lokman ⁵ , Azhar Bin Abd Aziz ⁶ , Afiza Binti Ismail ⁷	111
¹²³⁴ Politeknik Negeri Sriwijaya, Palembang, Indonesia	111
⁵⁶⁷ Universiti Teknologi MARA, Shah Alam, Malaysia	111
.....	112
The Best Academic Administration Personnel Selection Model Using the Weighted Sum Model (WSM)	
ID: 3535.....	112
M. Miftakul Amin * ¹ , Yevi Dwitayanti ²	112
¹ Department of Computer Engineering, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Bukit Besar, Palembang, 30139, Indonesia	112
² Department of Computer Accounting, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Bukit Besar, Palembang, 30139, Indonesia	112
Establishing the Interface for G-Bot Monitoring and Controlling System	
ID: 3800.....	113
Dewi Permata Sari ¹ , Fatma Indah Sari ² , Nyayu Latifah Husni ^{3,*} , Nurhaida ⁴ , Yogi Eka Fernandes ⁵ , Ade Silvia Handayani ⁶	113
¹⁻⁵ Electronic Engineering Study Program, Electrical Engineering Department, Sriwijaya State Polytechnic.....	113
⁶ Telecommunication Engineering Study Program, Electrical Engineering Department, Sriwijaya State Polytechnic	113

.....	114
Design of a 4G signal amplifier repeater biquad antenna at 1800 MHz	
ID: 3990.....	114
Ade Silvia Handayani ^{1*} , Sopian Soim ² , Ciksadan ³ , Rivaldo Arviando ⁴	114
¹⁻⁴ Department of Electrical Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia.....	114
.....	115
Design and Configuration of 4G Repeater Booster Device at 1800MHz	
ID: 3988.....	115
Ade Silvia Handayani ^{1*} , Sopian Soim ² , Emilia Hesti ³ , Ciksadan ⁴ , Nyayu Latifah Husni ⁵ , Abu Hasan ⁶	115
¹ Department of Electrical Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia	115
MULTIMEDIA DEVELOPMENT AS CREATIVITY IN THE SOCIALIZATION OF COVID19 VACCINATION AGAINST THE PUBLIC	116
ID: 3863.....	116
Dewi Irmawati ^{1*} , Devi Sartika ² , Ienda Meiriska ³ , Leni Novianti ⁴	116
^{1,,2,3,4} Study Program of Informatics Management, State Polytechnic of Sriwijaya	116
PERFORMANCE OPTIMATMIZATION OF YAGI ANTENNA DEVICES FOR DETECTING QUALITY LEVELS RIVER WATER BASED ON THE INTERNET OF THING	117
ID: 3767.....	117
Irawan hadi ^{1*} , Martinus Mujur Rose ¹ , Adewasti ¹ , Ciksadan ¹	117
¹ State Polytechnic of Sriwijaya, Jalan Srijaya Negera, Bukit Besar, Palembang - Indonesia.....	117
.....	118
Preliminary study: M-Health based on IoT and Machine Learning	
ID: 4032.....	118
Ahmad Taqwa ^{1*} , Ade Silvia Handayani ² , Sopian Soim ³ , Carlos RS ⁴ , Rahmat Budiarto ⁵ , Syifa Amira Zahra ⁶ , Junio Andika Danda ⁷	118
¹ Politeknik Negeri Sriwijaya.....	118
⁵ AlBaha University, KSA.....	118
.....	119
Analysis of Android-based Body Health Monitoring System Results using Fuzzy Mamdani Method	
ID: 3989.....	119
Ade Silvia Handayani ^{1*} , Ahmad Taqwa ² , Irawan Hadi ³ , Martinus Mujur Rose ⁴ ,.....	119

Nyayu Latifah Husni ⁵ , Sopian Soim ⁶ , Ratri Agustina ⁷	119
¹⁻⁷ Department of Electrical Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia.....	119
*Corresponding author. Email: ade_silvia@polsri.ac.id.....	119
.....	120
Design of Application an Intelligent Transportation System for Monitoring Traffic Accidents	
ID: 4035.....	120
*Ade Silvia Handayani ¹ , Sopian Soim ² , Carlos RS ³ , Syifa Amira Zahra ⁴ , Elisa Islami Putri ⁵	120
¹⁻⁵ Politeknik Negeri Sriwijaya	120
GEOGRAPHIC INFORMATION SYSTEM MAPPING AND MANAGEMENT OF CHILD WITH THE HIGHEST NUTRITIONAL POTENTIAL IN PRABUMULIH CITY USING K-MEANS CLUSTERING METHOD (CASE STUDY:	121
PRABUMULIH CITY HEALTH OFFICE)	
ID: 4096.....	121
Leni Novianti ^{1,*} , Robinson ² , Ienda Meiriska ³ , Resti Atika Sari ⁴	121
^{1,2,3,4} Study Program of Informatics Management,State Polytechnic of Sriwijaya.....	121
.....	122
COVID 19 Detection Application At Siti Fatimah Hospital Method of Using Deep Learning	
ID: 4098.....	122
Jayah ¹ , Leni Novianti ^{1,*} , Ida Wahyuningrum	122
¹ Informatics Management, State Polythecnic of Sriwijaya	122
Visual Studio Code for Activity Monitoring Interface	123
Nyayu Latifah Husni ^{1,*} Putri Adelia Rahma Sari ² Tresna Dewi ³ Ade Silvia Handayani ⁴ Devi Sartika ⁵ Akhmad Mirza ⁶	123
ID 4114.....	123
¹⁻⁶ State Polytechnic of Sriwijaya.....	123
*Corresponding author. Email: ade_silvia@polsri.ac.id	123
Solar Panel Analysis for Activity Monitoring System	124
ID 4111.....	124
Nyayu Latifah Husni ¹ , Putri Adelia Rahma Sari ² , Ade Silvia Handayani ^{3,*} , Yeni Irdyanti ⁴ A. Rakhman ⁵ , Hairul ⁶ , Seyed Amin Hosseini Seno ⁷ Wahyu Caesarendra ⁸	124
.....	125
THE INNOVATION OF SOUTH SUMATERA TRADITIONAL BATIK E-COMMERCE APPLICATIONS	
ID: 3847.....	125

Ayu Chotibah ^{1*} , Bainil Yulina ² , Desi Aprianty ³ , Evada Dewata ⁴ , Pridson Mandiangan ⁵	125
^{1,2,3,4,5} Politeknik Negeri Sriwijaya	125
THE ANALYSIS OF COST QUALITY ON PRODUCTIVITY OF IRON RAILING PRODUCTS IN SMALL AND MEDIUM	126
BUSINESS IN PALEMBANG	
ID: 3683.....	126
M. Thoyib ¹ , Riza Wahyudi ¹ , Firmansyah ¹ , Darul Amri ¹	126
¹ State Polytechnic of Sriwijaya	126
.....	127
Quality of Financial Reporting and Impact of GGG Implementation: Study on Local Government in Indonesia	
ID: 3757.....	127
Nelly Masnila ¹ , Firmansyah ² , Jovan Febriantoko ³ , Riana Mayasari ^{4*} , Jamaliah Said ⁵	127
^{1,2,3,4} Department of Accounting, State Polytechnic of Sriwijaya, Palembang, Indonesia	127
⁵ Accounting Research Institute, Universiti Teknologi MARA, Shah Alam, Malaysia	127
An Error Analysis of English Sentence Construction in Writing Subject Made by the Students of the English Department	128
at Sriwijaya State Polytechnics	
ID: 3796.....	128
Evi Agustina Sari ^{1*} , Sri Gustiani ¹ , Yusri ¹ , Tiur Simanjuntak ¹	128
¹ Sriwijaya State Polytechnics	128
.....	129
DISCLOSURE OF SUSTAINABLE PERFORMANCE IN HIGHER EDUCATION IN INDONESIA	
ID: 3827.....	129
Edwin Frymaruwah ¹ , Farah Aida Ahmad Nadzri ² , Periansya ¹ , Evada Dewata ¹	129
¹ Department of Accounting, Politeknik Negeri Sriwijaya, Palembang, Indonesia	129
.....	130
Improvement of LPKA Class 1 Palembang Electronic Dashboard with Field Performance Monitoring	
ID: 3976.....	130
Hendra Hadiwijaya ¹ , Febrianty ² , Rezania Agramanisti Azdy ^{3*}	130
^{1,2} Accounting Study Program, Palembang Palcomtech Polytechnic, Indonesia	130
³ Informatics Study Program, STMIK PalComTech, Indonesia.....	130

OPTIMIZATION OF INCOME PARAMETERS OF SONGKET CRAFTSMEN ON KOPERASI SONGKET PALEMBANG	131
ID: 3853.....	131
Neneng Miskiyah ^{1*} , Purwati ¹ , Yulia Pebrianti ¹ , Keti Purnamasari ¹	131
¹ Department of Business Administration, Sriwijaya State Polytechnic, Palembang, Indonesia	131
.....	132
Welfare Evaluation of the Duck Breeding in Gandus Subdistrict, Palembang	
ID: 3994.....	132
Marieska Lupikawaty ^{1*} , Neneng Miskiyah ¹ , Purwati ¹ , Keti Purnamasari ¹ , Julito Contado Aligaen ²	132
¹ Business Management Study Program, Department of Business Administration, Sriwijaya State Polytechnic ..	132
² Social Science Department, Iloilo Science, and Technology University Philippines	132
.....	133
Stock Price Valuation Using the Dividend Discount Model on IDX Mining Period 2011-2020	
ID: 3995.....	133
Dinda Febriani ¹ , Marieska Lupikawaty ^{1*} , Al Hushori ² , Haris Wilianto ²	133
¹ Sriwijaya State Polytechnic Business Management Study Program.....	133
² Business Administration Study Program, Sriwijaya State Polytechnic	133
Digital Branding Model for Jumputan and Songket Fabrics: as a Continuity Strategy for Marketing Palembang Local	134
Products	
ID: 4019.....	134
Desloehal Djumrianti ¹ , Rita Martini ² , Ikhtison Mekogga ³ , Alfitriani ⁴	134
¹ Business Administration Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia	134
² Accounting Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia	134
³ Computing Technique Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia	134
⁴ Business Administration Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia	134
.....	135
Perceptions of Use of Food Delivery Applications and Its Impact on Sales of Culinary Traders in Palembang City	
ID: 4023.....	135
Muhammad Husni Mubarak ¹ , Desi Indriasari ¹ Eka Jumarni ¹ Indra Satriawan ¹	135
¹ Department of Accounting, State Polytechnic of Sriwijaya, Palembang	135

Effect of Labor, Technology and Experience On Productivity of Rubber Smallholders In Kabupaten Banyuasin With Training as Moderating Variables	136
ID: 4038	136
Yahya ^{1,*} M. Yusuf ² , Elisa ³ , Yusnizal Firdaus ⁴ , AlHushori ⁵ , Suyatno Ladigi ⁶	136
^{1,2,3,4,5} Department of Business Administration, Sriwijaya State Polytechnic, Indonesia	136
⁶ Sosial Sains Gunaan, Universiti Sultan Zainal Abidin, Terengganu, Malaysia	136
DETERMINATION OF THE PERFORMANCE OF LOCAL GOVERNMENTS WITH AUDIT OPINIONS AS MODERATION VARIABLES IN SOUTH SUMATRA	137
ID: 4075	137
Niken Ayuningrum ¹ , Dian Ofasari ²	137
¹ Accounting Study Program, Sekayu Polytechnic	137
	138
Factors Affecting Customer Adoption to Mobile Banking Service	138
ID: 4137	138
Dewi Fadila ^{1,*} Hendra Sastrawinata ² . Markoni Badri ³ . Agung Anggoroseto ⁴	138
Mohd. Fadzli bin Ahmad ⁵ . Tayie Anak Ankus ⁶	138
¹ Business Administration Department. State Polytechnic of Sriwijaya, Indonesia	138
^{2,3,4} Business Administration Department. State Polytechnic of Sriwijaya, Indonesia	138
^{5,6} Commerce Deptatment. Politeknik Mukah Malaysia	138
The Role of Product Differentiation and Word of Mouth Promotion on Purchase Decision of Creative Industrial Products In Semarang City Waste Bank	139
ID: 3872	139
Hikmah ¹ , Andalan Tri Ratnawati ¹ , Susetyo Darmanto ^{1,*}	139
¹ Fakultas Ekonomika dan Bisnis, Universitas 17 Agustus 1945 Semarang, Semarang, Indonesia,	139
	140
ACCOUNTING COMICS AS A MEDIUM OF LEARNING	140
ID: 3893	140
Rosy Armaini ¹⁾ , Maria Maria ²⁾ , Leni Noviyanti ³⁾ , and Yevi Dwitayani ⁴⁾	140
^{1,2,4)} Accounting Department, State Polytechnic of Sriwijaya,	140

3) Informatics management Department. State Polytechnic of Sriwijaya,	140
.....	141
The Effect of Servicescape on Tourist Revisit Intention at Water Sports and Recreation Tourism Destination	
ID: 3915.....	141
Ambarwati, Risma ¹ , Iswan, Salsabila Rahmadina Putri ² , Ridho, Sari Lestari Zainal ^{3,*} , Jauhari, Hadi ⁴ , Paisal ⁵ , Afrizawati ⁶	141
¹²³⁴⁵⁶ Politeknik Negeri Sriwijaya	141
THE FACTORS AFFECTING REGIONAL EXPENDITURES ON REGENCY/MUNICIPALITY IN SOUTH SUMATERA	
.....	142
PROVINCE	
ID: 3949.....	142
Sherly Amerta Agustina ^{1,*} , M. Thoyib ¹ , Nurhasanah	142
¹ State Polytechnic of Sriwijaya	142
.....	143
Evaluation of Regional Financial Management Based on Local Government Information Systems	
ID: 3981.....	143
Maitsarana Ishmaturahwa ¹ , Sulaiman ¹ , Rita Martini ^{1*} , M. Thoyib ¹ , Kartika Rachma Sari ¹	143
¹ Accounting Department, Polytechnic State of Sriwijaya, Palembang 30139, Indonesia.....	143
.....	144
FINANCIAL PERFORMANCE ANALYSIS AT PT BANK MUAMALAT INDONESIA, Tbk.	
ID: 3983.....	144
M.Thoyib ^{1*} , Rita Martini ¹ , Tarisa Salsabella ¹ , Marsahanda Aprilia ¹	144
¹ Accounting Department, Polytechnic State of Sriwijaya, Palembang 30139, Indonesia.....	144
Poverty Reduction in South Sumatera with Optimization of Village Funds, Allocation of Village Funds, and Village	
Original Income	
ID: 3771.....	145
Rita Martini ^{1*} , Endah Widyastuti ¹ , Sukmini Hartati ¹ , Zulkifli ¹ , Mardhiah ¹	145
¹ Accounting Department, Polytechnic State of Sriwijaya, Palembang 30139, Indonesia.....	145
PROFITABILITY, COMPANY SIZE, AUDIT DELAY, AND FINANCIAL REPORTING DELAYS IN COVID-19 PANDEMIC	
.....	146
ERA	
ID: 3855.....	146

Sukmini Hartati ¹ , Rita Martini ¹ , Desri Yanto ¹ , Indriani Indah Astuti ¹ , Kartini Binti Ibrahim ²	146
¹ Polytechnic State of Sriwijaya, Palembang, Indonesia	146
² Polytechnic of Mukah, Malaysia	146
.....	147
Hotel and Restaurant Taxes Role to the Local Original Revenue of Regency/City in South Sumatera	
ID: 4001.....	147
Sovi Julianda Wahya ¹ , Sukmini Hartati ¹ , Eka Jumarni Fithri ¹ , Rita Martini ^{1*}	147
¹ Accounting Department, Polytechnic State of Sriwijaya, Palembang 30139, Indonesia.....	147
THE CALCULATION OF PRODUCT COMBINATION BY USING LINEAR PROGRAMING SIMPLEX METHOD TO	
.....	148
PROFIT MAXIMIZE AT ROTI SAHABAT PALEMBANG CITY	
ID: 4033.....	148
Nurya Mellinda ¹ , Afrizawati ² , Elisa ³ , M.Riska Maulana Effendi ⁴ , Paisal ⁵ , Alia Putri Benari ⁶ , Nadia Dwi Putri ⁷	148
¹⁻⁷ Polytechnic State of Sriwijaya	148
.....	149
The Factors Affecting Food Delivery Application Users Shopping Routine Behavior during the Covid-19 Pandemic	
ID: 4013.....	149
Ridho, Sari Lestari Zainal ^{1*} , Sabli, Habsah Binti Haji Mohamad ² , Ibrahim, Kartini Binti Che ³ , Jauhari, Hadi ⁴ , Detmuliati, Alditia ⁵ , Alfitriani ⁶ , Putri, Anggita Prameswari Pracena ⁷	149
¹⁴⁵⁶⁷ Politeknik Negeri Sriwijaya, Palembang, Sumatera Selatan, Indonesia.....	149
²³ Politeknik Mukah, Mukah, Sarawak, Malaysia	149
.....	150
Internal Control System Affects the Quality of Financial Report Information Palembang City Government	
ID: 4053.....	150
Rita Martini ^{1*} , Fildzah Rahmah Satirah ² , Nurhasanah ³ , Kartini binti Che Ibrahim ⁴ , Kartika Rachman Sari ⁵ , Endah Widyastuti ⁶ , Farida Husin ⁷ , Amelia Agustia Riskya Saputri ⁸	150
^{1,2,3,5,6,7,8} Accounting Department, Polytechnic State of Sriwijaya, Palembang 30139, Indonesia.....	150
⁴ Trade Department, Politeknik Mukah, Sarawak, Malaysia	150
GOOD GOVERNANCE AND INTERNAL CONTROL ON THE PREVENTION OF FRAUD IN THE PROCUREMENT OF	
.....	151
GOODS AND SERVICES FOR GOVERNMENT AGENCIES	
ID: 4076.....	151
Evada Dewata ^{1*} , Elfira Hidayanti ² , Yuliana Sari ¹ , Hadi Jauhari ³	151

¹ Accounting Department, State Polytechnic of Sriwijaya Palembang, Indonesia.....	151
² Alumni of the Public Sector Accounting, Study Program of State Polytechnic of Sriwijaya.....	151
³ Business Administration Department, State Polytechnic of Sriwijaya Palembang, Indonesia.....	151

INFLUENCE OF INDEPENDENCE, DUE PROFESSIONAL CARE AND ACCOUNTABILITY ON AUDIT QUALITY ON
152

THE AUDIT BOARD OF THE REPUBLIC OF INDONESIA REPRESENTATIVE PROVINCE OF SOUTH SUMATRA

ID: 4078.....	152
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Fipiariny. S ¹ , Nurhayati ²	152
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¹⁻² Accounting Study Program, Anika Palembang Polytechnic.....	152
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The Potential of Charcoal Gasification as an Eco-Friendly Fuel

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ABSTRACT

The use of coal as primary energy in Indonesia will continue to be carried out, although slowly it will experience a significant decline until 2050 by the mandate of the National Energy Policy and the General National Energy Plan; this is more or less due to the potential of national coal reserves of 38.84 Billion Tons. However, planning for green coal or clean coal must be the first step by providing added value for coal through downstream coal gasification methods where the pilot project will be held at PT Bukit Asam as a state-owned enterprise. Coal gasification will produce by-products in the form of char which allegedly still has energy potential. As an effort to recycle when that pilot project is going operation, this char is then used as raw material to make briquettes. In this preliminary research, using coal samples with seam variation from PT Bukit Asam and the gasification process produces some char. After char characterization result by proximate and ultimate analysis, it is found that char experiences an increase in Gross Calorific Value grades from 5,804 cal/gr to 6,183 cal/gr (seam A1), from 5,794 cal/gr to 6,281 cal/gr (seam A2), from 5,837 cal/gr to 6,320 cal/gr (seam B1) and from 5,898 cal/gr to 6,407 cal/gr (seam C) and a significant decrease in sulfur levels from 1.18% to 0.38% (seam A1), from 0.41% to 0.30% (seam A2), from 1.12% to 0.59% (seam B1) and from 1.19% to 0.69% (seam C) and also a significant decrease of inherent moisture from 16.10% to 12% (seam A1), from 15.10% to 11.40% (seam A2), from 17.6% to 10.30% (seam B1) and from 14.8% to 9.9% (seam C). This result makes char potentially a raw material for solid fuels that are environmentally friendly.

Keywords: "Coal", "Gasification", "Char", "Solid fuel"

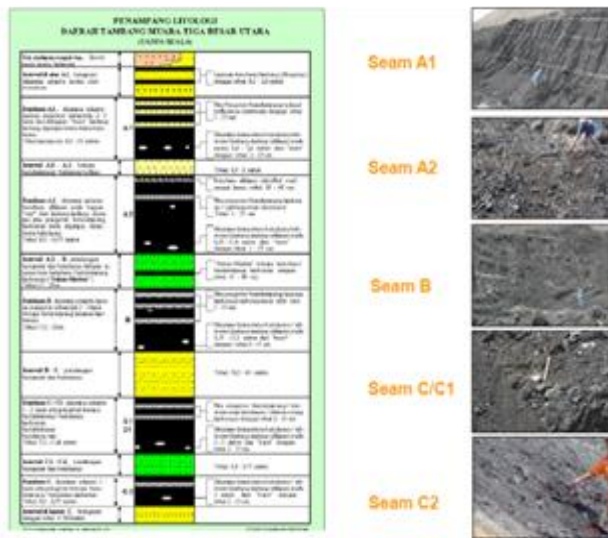
1. INTRODUCTION

Coal is one of the mining products included as one of the fossil fuels. Based on data British Petroleum (BP) Statistical Review of World Energy in 2021 (70th edition), the proven reserves of Indonesian coal for anthracite and bituminous types are estimated at 23,141 million tons and 11,728 million tons for the sub-bituminous and lignite types. Meanwhile, the world level coal reserves amount for anthracite and bituminous types and sub-bituminous and lignite types is about 753,639 million tons and 320,469 million tons, respectively [1]. In addition, according to data from the pers release on the website of Indonesian Ministry of Energy and Mineral Resources in 2021, total coal reserves in Indonesia are estimated at around 38.84 billion tons [2], where in addition to proven coal reserves, Indonesia has another data as coal resources predicted at approximately 143.7 billion tons.

Indonesia's coal resources quality is quite varied in terms of calorific parameters, ash and sulfur content, total moisture, and other parameters. About 60% of Indonesia's coal is in the medium rank of calorific coal or around 5100-6100 kcal/kg ADB (Air Dried Basis), another 30% coal quality is categorized as low rank with calorific value <5100 kcal/kg ADB, about 7% the coal quality is included in the high-rank category with calorific value 6100-7100 kcal/kg ADB and only 2% of the coal was included in the very high-rank category with calorific value more than 7100 kcal/kg ADB [3]. This difference in quality in a coal formation is often characterized by differences in layers (stratigraphy) that reflect differences in the age of the coal.

One of the South Sumatra basins containing coal-bearing formations is the Muara Enim Formation [4] which there are several coal layers (coal strata or seam), with each coal seam having a thickness that is not always the same. In the Muara Tiga Besar area, part of

Muara Enim Formation, several coal seams have been explored and included in the measured reserves, namely seam A1, seam A2, seam B1, seam B, seam C1, and seam C2 like in figure 1 below.



Source: Geology and Exploration. PT Bukit Asam.

Figure 1. Lithology Section of Muara Tiga Besar Formation

Steam Power Plant (*PLTU*) is one example of direct use of coal that is widely used in Indonesia and around the world, where coal is burned in boilers to generate heat that will be used to convert water into steam which is then used to drive steam turbines and turn generators to produce electrical energy. By-products in the form of gas flue and ash from burning coal cause increased levels of air pollution. Coal releases gases (CO_2 , N_2O , NO_x , SO_x , and Hg) that cause global warming and pollution that currently become the world concern. Besides that, coal mining also pollutes the environment with coal mine wastewater, but with electrocoagulation technology using aluminum electrode this can be overcome [5]. Therefore, the use of clean and efficient coal remains a challenge that needs to be pursued extensively in the framework of decarbonization while extending the life of its availability (coal conservation). In addition, to minimizing global environmental burdens, one way to increase the utilization of clean coal is by the coal gasification process. [6][7][8]. Besides the direct combustion by being the raw material of the power plant, low rank coal can also be used as an environmentally friendly fuel by making it as briquettes. The manufacture of coal briquettes aims to utilize low grade coal also to reduce the pollutant content of coal that are harmful to the environment [9].

Briquettes are the process of mixing one or more mashed materials (such as sawdust, bean shells, coconut coir, palm oil, rice husks, corn cobs, bamboo, and other flammable materials) into solid compression materials due to pressure and often using starchy materials such as starch cassava. [10].

Table 1. Coal Briquette Quality Standards

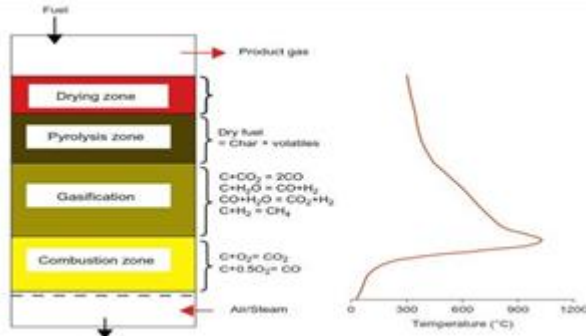
Briquettes	Moisture (%)	Volatile Matter (%)	Calorific Value (Cal/gr)	Total Sulfur (%)	Breaking Load (Kg/cm ²)
Lignite carbonized	Max 20	Max 15	Min 4000	Max 1	Min 60
Non-lignite carbonized	Max 7.5	Max 15	Min 5500	Max 1	Min 60
Egg-type non-carbonized	Max 12	according to the coal	Min 4400	Max 1	Min 65
Wasp nest non-carbonized	Max 12	according to the coal	Min 4400	Max 1	Min 10
Bio-coal briquettes	Max 15	according to raw material	Min 4400	Max 1	Min 65

Source [11]

To increase the added value of coal by turning it into solid fuel through briquettes, focusing only on increasing the calorific value is not enough, apart from the nature of coal, which has a lot of solid carbon, at the same time coal also has low volatile matter. This condition results in a high ignition temperature [12][13]. Therefore, to anticipate this problem, coal briquettes will be added with biomass (agricultural/plantation waste). This is because the volatile matter content of the biomass is very high so that it allows ignition from low temperatures, which can then save the time and energy needed for ignition [12][14]. Efforts to make briquettes by mixing coal with biomass are called bio briquettes. Because it has a calorific value equal to the calorific value of coal and even exceeds it, coconut shell was chosen as an additive to increase the fuel value of bio briquettes [13]. Thus, in this study, the biomass that will be used as supporting material is a coconut shell, considering that this biomass has good thermal diffusion properties and can produce heat around 6500-7600 kcal/kg [13][15].

The converting process from solid fuels or some hydrocarbon-containing materials such as coal and biomass into combustion-capable gases like CO , CH_4 , and H_2 with added a limited air supply (about 20% until 40% stoichiometric air supply) was known as the gasification process [16][17]. The difference between the gasification and pyrolysis process lies in the presence of air supply in the process. Biomass pyrolysis is commonly initiated from 300°C temperature to 600°C [17][18]. This process order and temperature are shown in figure 2 below. The product of pyrolysis generally depends on several factors, including pyrolysis temperature factor and also heating rate. In general, pyrolysis products can be classified [16]:

- Solid products: rich in carbon content (char)
- Liquid products: tar, hydrocarbons, and water
- Gas products: (CO , H_2O , CO_2 , C_2H_2 , C_2H_4 , C_2H_6 , C_6H_6 , etc.).



Source: [17]

Figure 2. Temperature Stages and Distributions in a Gasifier

The pilot project of coal gasification or down streaming coal to provide added value for coal in Indonesia will be held at PT Bukit Asam as a state-owned enterprise and has been confirmed in the law of the mineral and coal number 3 of 2020, mainly in article 102 paragraph 1 which is requiring for the mining industry to enhance the added value of minerals and coal which reads "IUP (mining license) or IUPK (special mining business license) holders at the production operation stage are required to increase the added value of minerals in mining business activities through: a) Processing and Purification of metal mineral mining commodities, b) Processing of non-metal mineral mining commodities, and c) processing of rock mining commodities" [19].

In the process of gasification, the desirable main product is syngas [12][20] that can be used in combined heat and power (CHP) engines. On the other hand, a by-product called char, is obtained. Disposal management of char as residues from an industrial for future gasification plants is very important [12] because the accumulation of char in a certain period of time as a stockpile can have an effect on the environment [21]. From the results of the literature study, it is found that the char gasification result may have increased the carbon value so that it can be an initial hypothesis that char still contains energy potential and a significant decrease in sulfur levels. With the initial premise, therefore, in this study, the results of waste in the form of char become a potential raw material for the manufacture of briquettes. The manufacture of briquettes from coal is one form of utilization of coal into environmentally friendly energy. The use of char from the gasification process is an effort to reprocess/recycle waste gasification that has been done before. The gasification industry in the future will be one of the downstream coal programs [22], so that the use of charcoal gasification in the future will be one of the projects for the industry.

Research similar to this study has been carried out. The study was taken from several references to research on making briquettes using coal as the primary material, which has a character resembling char from gasification

combustion, and other studies that use variations in the composition of coal and biomass raw material.

So, in general, what distinguishes the proposed research from previous research as a research renewal is, this study tries to characterize bio briquettes using char as a by-product of coal gasification (recycle) with variations in layers or stratigraphy of coal raw materials for gasification, with the addition of coconut shell charcoal. As a mixture of biomass, analyze the effect of the ratio of the two on the quality of the briquettes and the emissions produced in its combustion to obtain an environmentally friendly solid fuel.

This preliminary research focuses on characterizing char as a by-product of the gasification process using several types of PT Bukit Asam's coal from different stratigraphies, which are expected to reflect differences in properties and quality. Contribution to the mining industry, in this case, PT Bukit Asam, is converting coal into gas fuel and utilizing char waste as recycled from the gasification plant process to the next project by making briquette with biomass added.

2. RESEARCH METHODOLOGY

2.1 Material

The coal used in this study is taken from the Muara Tiga Besar mine site of PT Bukit Asam with seam variation: seam A1, seam A2, seam B1 and seam C at the coordinates of 3°43'16,315"LS, 103°42'30,463", with mine brand MT 47 (4600 – 4800 kcal/kg, ar).

2.2 Coal Sampling

Coal sampling at the mining front using the sampling method named the channel sampling or front sampling. Sampling carried out on coal seams that have been exposed, such as on walls or floors in mines. Sampling of the coal using an in situ sampling model without a scale, or it can be said that the manual sampling method is human as an operator, the tools used are scoops and plastic bags.



Figure 3. Coal Sampling Activity

2.3 Research Method

In this research, there are two primary studies: the coal gasification process and the proximate and ultimate analysis in the laboratory of coal as a source of raw materials, char analysis of the by-products of coal gasification and as additional biomass coconut shells.

2.3.1 Coal Gasification

Procedures for obtaining char by coal gasification is the following steps:

1. The fuel used is coal obtained through outcrop sampling at the Muara Tiga Besar coal mining of PT Bukit Asam with seam variation. Before being used as a gasification raw material, this coal must be reduced in size to be incorporated into the reactor. Once the size is reduced, the coal is drained in the oven for 2 hours at room temperature. Coal that has been dried is put into an airtight plastic bag as much as 10 kg for one run.
2. Single Gas Outlet System Gasification Procedure. Put 10 kg of prepared coal into the reactor. Then burn with a flame igniter to start the combustion process. The air valve is left open, and make sure the valve on the syngas pipe is closed. The blower is turned on and fully opened the valve on the piping system. Wait ± 10 minutes until the coal becomes coal. Then the pyrolysis process will occur, and the char to be used will be formed in this process.
3. Char that has been obtained is then separated and characterized to find out its initial quality.



Figure 4. Char Side-Products of Coal Gasification.

2.3.2 Proximate and Ultimate Analysis

Before the gasification process is carried out, the coal is first carried out proximate and ultimate analysis to determine the content of the coal sample. After the gasification process is complete and char is obtained, it will then be carried out to laboratory for the following process, namely proximate and ultimate analysis. This

characterization includes moisture, ash content, sulfur levels, volatile matter, fix carbon, and calorific levels.

1. Moisture
 - a. Weigh empty containers in advance
 - b. Put the sample in a container.
 - c. Put in a preheated oven from 104°C to 110°C.
 - d. Heat the container containing the weight of the sample for ± 1 hour.
 - e. Open the oven, and quickly close the dry weighing bottle and cool in a desiccator.
 - f. Immediately weighed it if it had reached room temperature.
 - g. Calculates the value of water content with the formula [13]:

$$\text{Water Content (\%)} = \frac{m_2 - m_3}{m_2 - m_1} \times 100\%$$

2. Ash Content
 - a. Put the sample into the furnace, then heat it until the furnace reaches 700°C-750°C ± 1 hour or until all samples burn perfectly to ashes.
 - b. Lift the container from the furnace, place the lid on the cup and metal plate.
 - c. Cool for 10 minutes, then put in a desiccator.
 - d. Put the cold ash in the weighing cup and then calculate the ash level according to the formula. [13]:

$$\text{Ash Content (\%)} = \frac{m_3 - m_1}{m_2 - m_1} \times 100\%$$

3. Sulfur Level
 Sulfur levels are carried out using the Eschka Method, as follows: [13]:
 - a. Mixed 1 kg of the sample with 3 grams of Eschka.
 - b. Heat the sample into the furnace slowly until the temperature reaches 800 ± 25 °C for 1 hour. Heat at this temperature for ± 1.5 hours until the mixture melts perfectly.
 - c. Cool the sample at room temperature, re-dissolve with 100 ml of hot water in a 200 ml chemical glass, heated into a hot plate for 1/2 - 3/4 hour, stirring occasionally.
 - d. Filter it with filter paper and then wash with a material that does not dissolve with hot water. After several washes, transfer the material to filter paper and rewash it with hot water up to five times.
 - e. Dilute the filtrate with 250 ml of methyl orange and neutralize with a solution of NaOH or Na₂CO₃, then add a solution of HCl 1 ml (1:9), boiled and add 10 ml or more of BaCl₂ solution with a slow pipette while stirring.
 - f. Bring the solution back to be boiled for 15 minutes and let stand overnight. Then filtered with ash-free filter paper (Whatman filter paper

- no.42) and wash with hot water until the filtrate does not form mud when added agno₃solution,
- g. Put the sludge-filled filter paper into a porcelain cup which weight is already known, then burn it gradually in a furnace to a temperature of 800.
 - h. Cool it in a desiccator, then weigh by using formulas [13]:

$$\text{Sulfur Total Content (\%)} = \frac{(m_1 - m_3) \times 13,738}{m_1}$$

4. Volatile Matter
 - a. Put the sample in a sealed container, then heat it to a temperature of 900°C for 7 minutes.
 - b. Lift the container and leave it cool over a metal plate for 5 minutes, then put in a desiccator.
 - c. Once cool, then weigh and calculate volatile matter with the formula [13]:

$$\text{Volatile Matter (\%)} = \frac{m_2 - m_3}{m_2 - m_1} \times 100\% - M_{ad}$$

5. Carbon Level
Fixed carbon is calculated using calculations of other types of proximate analysis, namely by subtraction of ash levels, water content, and levels of volatile matter.

$$\text{Fixed Carbon} = 100\% - (\% M + \% VM + \% A)$$

6. Calorific Value
Calorific Value level can be determined using a Bomb Calorimeter. The steps are as follows:
 - a. Weigh 1 gram of sample into a cup.
 - b. Put it in a calorimeter bomb.
 - c. Put a 10 cm yarn burner on the wire connecting the two poles of the bomb head. Turn the yarn until the end touches the sample. The head of the bomb that already contains the sample is inserted into the Calorimeter bomb then rotates until it is closed and locked.
 - d. Press "start" below, then "continue", enter the code name or sample ID, and then press enter, see the bomb ID, adjust the bomb head code, then press enter and type the weight of the sample and then automatically the tool will analyze the sample and calculate it.

3. RESULT AND DISCUSSION

This paper discusses the result of the characterization of coal samples from PT Bukit Asam with variation seam A1, seam A2, seam B1 and seam C. then the coal sample is gasified to obtain by-products in the form of char. This char sample is then tested for proximate and ultimate analysis again to determine the changes after the coal sample undergoes the gasification

process. The chemical changes that occur are depicted in the table below:

Table 2. Proximate Seam Coal Analysis Values

No	Proximate Analysis	Coal Seam			
		A1	A2	B1	C
1	Total Moisture (% ar)	27.5	31.9	30.7	31.70
2	Inheren Moisture (% adb)	16.1	15.1	17.6	14.80
3	Ash Content (% adb)	1.30	1.10	2.60	1.30
4	Volatile Matter (% adb)	40.6	39.20	40.9	40.00
5	Fixed Carbon (% adb)	42.0	44.60	38.90	43.90
6	Total Sulphur (% adb)	1.18	0.41	1.12	1.19
7	Calorific Value (Cal/gr)	5,804	5,794	5,837	5,898

Table 3. Ultimate Seam Coal Analysis Values

No	Ultimate Analysis	Coal Seam			
		A1	A2	B1	C
1	Carbon (% adb)	61.36	60.96	58.95	61.72
2	Hydrogen (% adb)	6.38	6.21	6.37	6.30
3	Nitrogen (% adb)	0.81	0.80	0.76	1.02
4	Sulfur (% adb)	1.03	0.86	1.12	1.19
5	Oxygen (% adb)	30.16	30.93	31.33	29.67

Table 4. Proximate Char Analysis Values Coal Gasification Results

No	Proximate Analysis	Char Gasification from Seam			
		A1	A2	B1	C
1	Inheren Moisture (% adb)	12.0	11.4	10.3	9.9
2	Ash Content (% adb)	0.70	1.70	3.70	7.60
3	Volatile Matter (% adb)	40.0	41.5	42.7	41.7
4	Fixed Carbon (% adb)	47.3	45.4	43.3	40.8
5	Total Sulphur (% adb)	0.38	0.30	0.59	0.69
6	Calorific Value (Cal/gr)	6,183	6,281	6,320	6,407

Table 5. Ultimate Char Analysis Values Coal Gasification

No	Ultimate Analysis	Char Gasification from Seam			
		A1	A2	B1	C
1	Carbon (% adb)	72.63	72.72	72.78	73.79
2	Hydrogen (% adb)	4.48	4.53	4.46	3.26
3	Nitrogen (% adb)	1.15	1.11	1.75	1.82
4	Sulfur (% adb)	0.44	0.35	0.69	0.84
5	Oxygen (% adb)	21.04	20.11	17.69	14.21

From tables 2 and 3, the results of the proximate and ultimate analysis of coal with several seams are obtained, namely seams A1, A2, B1 and C while tables 4 and 5 show the results of the proximate and ultimate analysis of the char gasification results from coal from

seam A1, seam A2, seam B1 and seam C that have previously been analyzed. And from Figure.5 below, the graph that describes the proximate value of all the coal seams that are sampled, it can be seen that the difference in seams does not provide a significant difference in levels.

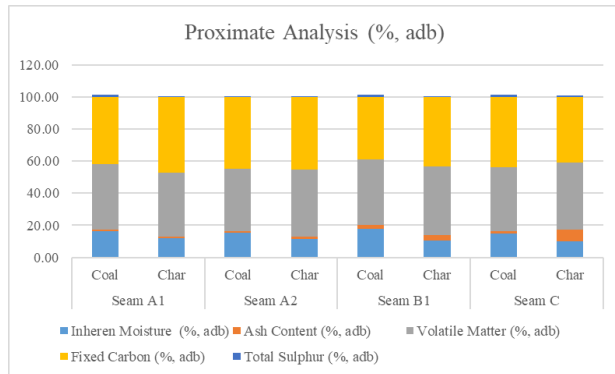


Figure 5. Proximate Analysis for All Seam

To make good and environmentally friendly briquettes, several critical indicators are needed: calorific value, sulfur content, water content and other indicators. The following is a graph that shows the difference in the chemical properties of the raw material of coal into char gasification results.

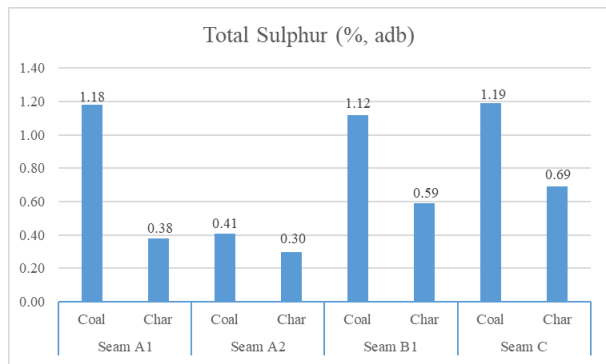


Figure 6. Analysis of Total Sulfur in Each Seam

Figure.6 above shows a significant decrease in sulfur content from each coal seam A1, seam A2, seam B1 and seam C, where the most significant reduction occurred in seam A1. This significant decrease in sulfur levels from 1.18% to 0.38% (seam A1), from 0.41% to 0.30% (seam A2), from 1.12% to 0.59% (seam B1) and from 1.19% to 0.69% (seam C). This shows that the gasification process reduces sulfur levels so that the char produced is safer for the environment.

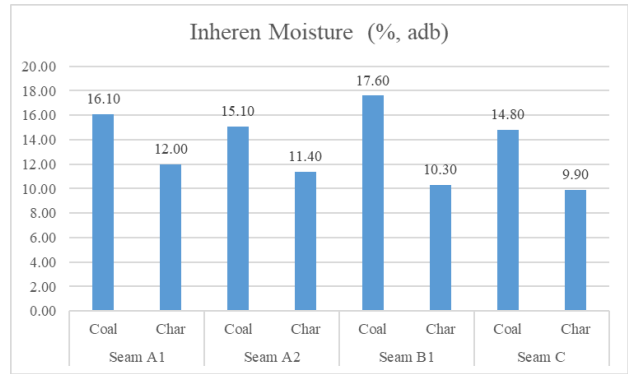


Figure 7. Analysis of Inherent Moisture in Each Seam

One indicator of a good briquette has low water content. The gasification process is generally proven to reduce water content significantly, making char an excellent raw material for briquettes. Significant decrease of inherent moisture in all seam are from 16.10% to 12% (seam A1), from 15.10% to 11.40% (seam A2), from 17.6% to 10.30% (seam B1) and from 14.8% to 9.9% (seam C).

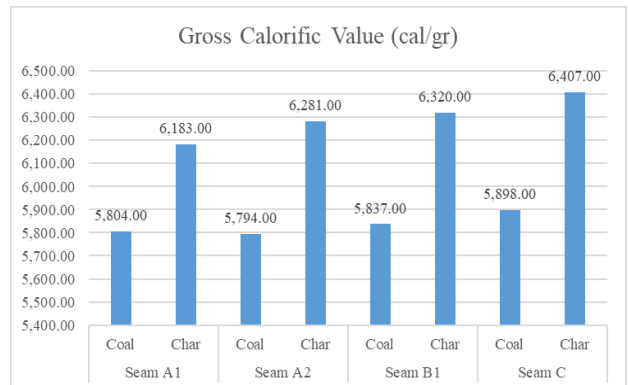


Figure 8. Analysis of Calorific Value in Each Seam

Table 6. Proximate Coconut Shell Analysis Value

No	Proximate Analysis	Coconut Shell
1	Moisture (% adb)	5.8
2	Volatile Matter (% adb)	18.2
3	Ash Content (% adb)	2.1
4	Total Sulfur (% adb)	0.04
5	Fixed Karbon (% adb)	73.9
6	Calorific Value (cal/gr)	7,274

Another indicator that is no less important is the calorific value, in Figure 8, it can be seen that there is an increase in the calorific value from the initial raw material of coal to char. An increase in gross calorific value grades from 5,804 cal/gr to 6,183 cal/gr (seam A1), from 5,794 cal/gr to 6,281 cal/gr (seam A2), from 5,837 cal/gr to 6,320 cal/gr (seam B1) and from 5,898

cal/gr to 6,407 cal/gr (seam C). This shows that the briquettes produced have the potential to have an excellent calorific value, especially when added with coconut shell biomass, as in the table.6 above where it can be seen that the calorific value of coconut shell charcoal is very high with low water content, so it is hoped that the addition of this coconut shell will increase the calorific value of the briquettes that will be produced.

4. CONCLUSION

From the results of the proximate and ultimate analysis of coal before gasification and char gasification results side result, obtained an increase in gross calorific value from each coal seam and a decrease in the total sulfur value and inherent moisture of each coal seam. After char characterization result by proximate and ultimate analysis, it is found that char experiences an increase in Gross Calorific Value grades from 5,804 cal/gr to 6,183 cal/gr (seam A1), from 5,794 cal/gr to 6,281 cal/gr (seam A2), from 5,837 cal/gr to 6,320 cal/gr (seam B1) and from 5,898 cal/gr to 6,407 cal/gr (seam C) and a significant decrease in sulfur levels from 1.18% to 0.38% (seam A1), from 0.41% to 0.30% (seam A2), from 1.12% to 0.59% (seam B1) and from 1.19% to 0.69% (seam C) and also a significant decrease of inherent moisture from 16.10% to 12% (seam A1), from 15.10% to 11.40% (seam A2), from 17.6% to 10.30% (seam B1) and from 14.8% to 9.9% (seam C).

Where the stratigraphic differences have no significant effect to characteristics of coal and char, this can be seen from the results of the proximate and ultimate analysis which are not much different so that the general use of char from any seam can be carried out on coal from the Muara Tiga Besar mines of PT Bukit Asam. And with the addition of coconut shell charcoal is expected to increase the calorific value of the briquettes that will be produced.

This shows that the char gasification by-product which is considered an undesirable material has energy potential that can be developed into raw material for briquettes as a more environmentally friendly fuel than direct coal combustion. The char characteristics meet the requirements according to the standard table of briquette quality, where the minimum heat value is 4000 KCal/ Kg, and the sulfur value is a maximum of 1%. With this research, it is expected to be one of the solutions for utilizing char as gasification industrial waste in the future, especially at PT Bukit Asam.

AUTHORS' CONTRIBUTIONS

All of the author are involved in the process of coal sampling, gasification process, proximate and ultimate analysis. The first and corresponding author contribution is responsible for coal sampling, data processing and manuscript writing. The second author is

responsible for gasification process and char handling. The third author is responsible for proximate and ultimate analysis.

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REFERENCES

- [1] Statistical Review of World Energy July 2021, British Petroleum, UK. 2021
- [2] <https://www.esdm.go.id/id/media-center/arsip-berita/cadangan-batubara-masih-3884-miliar-ton-teknologi-bersih-pengelolaannya-terus-didorong-> (accessed 30 November 2021, 18:09 Wib)
- [3] Munandar, A. Imam., Z. Aprilasani, Samputra & P. Lindiasari., *Industri Pertambangan di Indonesia*. Jakarta. Bypass Publisher. 2018
- [4] S. Gafoer, T. Cobrie & J. Purnomo, *Peta Geologi Lembar Lahat, Sumatera, Puslitbang Geologi*, Bandung. 1986
- [5] Rusdianasari, A. Taqwa, and Y. Bow, *Treatment of Coal Stockpile Wastewater by Electrocoagulation Using Aluminum Electrodes*, *Advanced Materials Research* Vol. 896 (2014) pp 145-148.
- [6] A. Syarif, A. Aswan, I. Rusnadi, A. Fadhulullah, N. Azizah, *Effect of Air Flow and Filter Variation on Coal Gasification Process with The Downdraft System*. *Jurnal Kinetika* Vol. 11, No. 01 (March 2020): 36-44. Politeknik Negeri Sriwijaya, Palembang. 2020
- [7] D. Vamvuka, *Gasification Coal in a book: Clean Use of Coals*. *Low-Rank Coal Technologies*, MultiScience Publishing Co. Ltd., 2000
- [8] Julismi, Rusdianasari, A. Hasan, *Syngas Underground Coal Gasification (UCG) Testing of In-Situ Type Lignite Coal and Fracture Type Coal*, *International Journal of Research in Vocational Studies (JRVOCAS)* Vol. 1, No. 2, August 2021 Print ISSN 2777-0168 | Online ISSN 2777-0141 | DOI prefix: 10.53893
- [9] S.S Idris, M. I. Zailan, N. Azron, N.A Rahman, *Sustainable Green Charcoal Briquette from Food Waste via Microwave Pyrolysis Technique: Influence of Type and Concentration of Binders on Chemical and Physical Characteristics*, *Int. Journal of Renewable Energy Development (IJRED)*. 2021
- [10] O. J. Lawal, T. A. Atanda, S. O. Ayanleye & E. A. Iyiola., "Production of Biomass Briquettes Using

- Coconut Husk and Male Inflorescence of *Elaeis Guineensis*". *Journal of Energy Research and Reviews* 3(2): 1-9, 2019; Article no. JENRR.50112 ISSN: 2581-8368, Nigeria. 2019
- [10] Permen ESDM No 047 Tahun 2006. "Tentang Pedoman Pembuatan dan Pemanfaatan Briket Batubara dan Bahan Bakar Padat Berbasis Batubara". Jakarta. 11 September 2006
- [11] P. Hwangdee, Chaiyan, Jansiri, S. Sudajan, K. Laloon, Physical Characteristics and Energy Content of Biomass Charcoal Powder, *International Journal of Renewable Energy Research*. Vol.11, No.1, March, 2021
- [12] V. Benedetti, F. Patuzzi, M. Baratieri, Gasification Char as a Potential Substitute of Activated Carbon in Adsorption Applications. *The 8th International Conference on Applied Energy – ICAE2016*. *Energy Procedia* 105 (2017) 712 – 717. 2017
- [13] M. Yerizam, M.M. Faizal & Novia, Characteristics of Composite Rice Straw and Coconut Shell as Biomass Energy Resources (Briquette) (Case study: Muara Telang Village, Banyuasin of South Sumatra). *International Journal on Advanced Science Engineering Information Technology* Vol.3 (2013) No. 3 ISSN: 2088-5334. 2013
- [14] Cui Quan and Ningbo Gao, Review Article: Coprolysis of Biomass and Coal: A Review of Effects of Coprolysis Parameters, Product Properties and Synergistic Mechanisms, *Hindawi Publishing Corporation BioMed Research International* Volume 2016, Article ID 6197867, 11 pages, <http://dx.doi.org/10.1155/2016/6197867>.
- [15] S.S Idris, M. I. Zailan, N. Azron, N.A Rahman, Sustainable Green Charcoal Briquette from Food Waste via Microwave Pyrolysis Technique: Influence of Type and Concentration of Binders on Chemical and Physical Characteristics, *Int. Journal of Renewable Energy Development (IJRED)*. 2021
- [16] Basu, Prabir. *Biomass Gasification and Pyrolysis Practical Design and Theory*. Published by Elsevier Inc, 2010
- [17] M. Trifiananto, *Characterization of Updraft Coal Gasification with Variation of Equivalence Ratio*, Institut Teknologi Sepuluh November, Surabaya. 2015
- [18] Sarmidi, M. Yerizam, A. Syarif, Syngas Characteristics from UCG Gasification Process with Lignite and Subbituminous Coal Types, *International Journal of Research in Vocational Studies (IJRVOCAS)* Vol. 1, No. 2, August 2021. Print ISSN 2777-0168 | Online ISSN 2777-0141 | DOI prefix: 10.53893
- [19] Undang-undang nomor 3 Tahun 2020 tentang Perubahan Atas Undang-Undang Nomor 4 Tahun 2009 Tentang Pertambangan Mineral dan Batubara, 2020
- [20] J. Lemana, A. Hasan, A. Syarif, Syngas Underground Coal Gasification (UCG) Testing of Fracture Type Subbituminous Coal in Laboratory Scale. *International Journal of Research in Vocational Studies (IJRVOCAS)*. Vol 1, No 2, August 2021. Print ISSN 2777-0168| Online ISSN 2777-0141| DOI prefix: 10.53893
- [21] Rusdianasari, S. Arita, E. Ibrahim, Ngudiantoro, *Characteristic of Coal Stockpile in Lowland and the effect to Environment*, Springer Series in Materials Science, Volume 204 in *Recent Trends in Physics of material Science and Technology*, 2015.
- [22] A. Zulatama, A. Syarif, M. Yerizam, Effect of Oxygen Flow Rate on Combustion Time and Temperature of Underground Coal Gasification, *International Journal of Research in Vocational Studies (IJRVOCAS)* Vol. 1, No. 2, August 2021 Print ISSN 2777-0168 | Online ISSN 2777-0141 | DOI prefix: 10.53893



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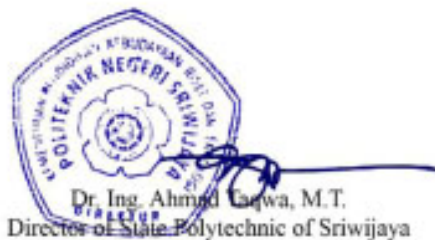
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